STUDY OF SNIGDHAM ASHNEEYAAT WITH THE INTERVENTION OF GOGHRITA (COW'S GHEE) IN RELATION TO THE STATUS OF RASA DHATU AND LIPID PROFILE

A THESIS SUBMITTED TO

TILAK MAHARASHTRA VIDYAPEETH, PUNE

FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY (Ph.D.)

In AYURVEDA – KRIYA SHAREERA

Under the Board of Ayurveda Studies

Estd. 1921

Submitted By

Dr. Varuni. S. J.

(Registration No. 05613007776)

Under the Guidance of

Dr. Kalpana Dilip Sathe

DEPARTMENT OF AYURVEDA

MAY 2022

CERTIFICATE OF THE SUPERVISOR

It is certified that work entitled "Study of Snigdham Ashneeyaat with the intervention of Goghrita (cow's ghee) in relation to the status of Rasa dhatu and Lipid profile" is an original research work done by Dr. Varuni. S. J, under my supervision for the degree of Doctor of Philosophy in Kriya Shareera, to be awarded by Tilak Maharashtra Vidyapeeth, Pune. To best of my knowledge this thesis

- Embodies the work of candidate herself.
- Has duly been completed.
- Fulfils the requirement of the ordinance related to Ph. D. degree of the TMV.
- Up to the standard in respect of both content and language for being referred to the examiner.

Date :

Place : Pune

Signature of the Supervisor

Dr. Kalpana Sathe

क्रिया शारीर विभाग/Dept. of Kriya Sharira
अखिल भारतीय आयुर्वेद संस्थान, सरिता विहार, नई दिल्ली-110076
ALL INDIA INSTITUTE OF AYURVEDA, Sarita Vihar, New Delhi-110076

DECLARATION

I hereby declare that the thesis entitled "*Study of Snigdham Ashneeyaat with the intervention of Goghrita (cow's ghee) in relation to the status of Rasa dhatu and Lipid profile*" completed and written by me has not previously been formed as the basis for the award of any Degree or other similar title upon me of this or any other Vidyapeeth or examining body.

[Dr. Varuni. S. J.]

Signature of the Research Student

Place: Pune

Date:

ACKNOWLEDGEMENT

It is a moment of happiness to see my dream come true, by the grace of Almighty and Guru. I offer my prayers for providing me knowledge and energy to complete this dissertation in the present form. Without his grace it would not have been possible for me to execute this work.

I express my respectful gratitude to Dr. Kalpana Dilip Sathe, M.D. (Ay) PhD Professor, Dept. of Kriya Shareera, my honorable guide, for her valuable guidance, suggestions, cooperation, care and concern bestowed on me.

I express my gratitude to Dr. Abhijith Joshi., Registrar and Head, department of Ayurveda, Tilak Maharashtra Vidyapeeth Pune, for his kind cooperation, support during every crisis and guidance with his valuable suggestions.

I am grateful to Vice chancellor, Registrar, Dr. S.P.Sardeshmukh, Dean, of Tilak Maharashtra Vidyapeeth, Pune for providing me an opportunity to pursue my PhD.

I am thankful to Dr. S.M. Sathe, Dr. Manoja Joshi of Pune and all the faculty members.

I also express my gratitude to Dr. Ganesh Puttur, Principal, SSCASR, Bengaluru for supporting during my studies.

I extend my thanks to Dr. Jalindar Dhamale, H.O.D, Dept. of Kriya Shareera, SSCASR, Bengaluru, for lending a helping hand to execute the work. .

I express my gratitude to Dr. Aparna Desai and Shri Gautam Mukherjee, Sri Sri Ayurveda hospital, Bengaluru, for providing essential help in lab investigations.

I sincerely convey my heartfelt thanks to Shri Lancy D Souza**,** Asst. Professor in psychology & Dr. Altaf, for their help, support and valuable timely suggestions regarding statistics.

I am deeply indebted to Dr. Nikhila Hiremath, Dr. Sriharsha. K.V, & Dr. Srinagesh K. A, for their immense support in words and deeds, inspiration, timely cooperation and for making my dreams about this work to come true. They always

stood by my side with continuous encouragement and precious advice and helped me to withstand the hurdles during the execution of my work.

I also want to express my gratitude to Dr. Arpana P. V., Dr. Keerthi, and Dr. Deepika R., Dr. Savitha, & Dr. Ranjith for assisting me with important tasks.

I convey my profound gratitude to lab technicians Mr. Umesh Kumar, Mrs. Deepali Dhamale, and Mrs. Suma for the timely help rendered to me.

I bow before my parents, who have been inspiring me all along my life. I also express my love and gratitude to my husband DR. K.S. Krishna Kumar for supporting and encouraging me in all my endeavors.

I express my thanks to librarian Vijaya tauro and team, and M/S Suresh Printers, & Shankar book binders Bengaluru and their staff for their support in printing and binding.

I am extremely thankful to Smt. Sushama Pathak, and other staff of Department of Ayurveda, Tilak Maharashtra Vidyapeeth, Pune, for their patience and endurance in responding to our doubts and clarifications.

Last but not the least, I sincerely convey thanks from the bottom of my heart to all the participants who enthusiastically took part and cooperated in the study.

I express my thanks to all the persons who have directly or indirectly supported me in this work. If I have left any help extended by anybody unacknowledged, it is by sheer oversight for which I beg their excuse.

Dr. Varuni. S. J.

ABSTRACT

Food is considered as prana or vital force for which all the living beings aspire. Anything which fills up the stomach to free from hunger cannot be called as food. Food should constitute color, smell, taste & touch according to the likings of that person & it should be consumed according to the rules and regulations for taking food as said in Ayurveda classics, only then the person gets the benefits. Food provides color and complexion, happiness, mental satisfaction, nourishment, strength, memory etc. Presence of all these qualities in food serves the purpose of consuming it.

Ayurveda advocates that *ahara* (diet) plays an important role in our daily life. Among the *ahara*, *sneha* is considered as *rasayana* which means the intake of *sneha* like *ghrita* rejuvenates the body and promotes longevity. While explaining about the rules for taking food, it is said in Ayurveda classics that one should have food which is made *snigdha* (unctuous). This helps for easy digestion of food. Ayurveda supports the intake of *ghrita* daily as *ajasrika rasayana*.

Ghee is considered to be an integral part of the human diet in India since ages. Rate of consumption varies according to region, and individuals. Ghee has good nutritious and therapeutic value. Ayurveda suggests the use of cow's ghee as best among other ghee.

In recent years the over consciousness about one's fitness has made the people to believe the much hyped notion that "consumption of ghee increases cholesterol" which has made them to stop usage of ghee along with food.

Every food item we consume encounters with *agni* and results in the formation of *ahara rasa* and thus *rasa dhatu*. Even the ghee consumed will be making an entry in to the *rasa dhatu* thus circulating all over the body.

Rasa which is considered as the *aadya dhatu* continuously circulates and forms the *aadhara* for nourishment of consecutive *shad dhatus*. It circulates along with *rakta dhatu* all throughout the body.

Serum is mainly composed of water, blood proteins and inorganic electrolytes. It serves as transport medium for glucose, lipids, amino acids, hormones, metabolic end products, carbon dioxide and oxygen.

Lipid profile is a panel of blood tests that serves as an initial broad medical screening tool for abnormalities in lipids, such as cholesterol and triglycerides.

The current study is an effort to explore the effects of *goghrita* on *rasa dhatu* after undergoing *paka* through *jatharagni* keeping bio chemical changes in lipid values as an objective parameter and assessment of *rasa dhatu* in its totality as subjective parameter.

Need for study:

The general public are well aware of health risk factors because of the vast information available through media and internet. They know about the familial risk factors for diabetes mellitus, obesity and cardiovascular disorders thus, they totally avoid intake of ghee.

In Ayurveda it has been said that goghrita is one of the nitya sevaneeya aahara dravya. The rule for consumption of ahara is “snigdham ashneeyaat”

This process of consuming ghrita along with bhojana is fading out leading to increase in rukshata inturn leading to vata vruddhi which may have manifold implications on various aspects of health of the individual, ultimately reducing the quality of life. But, recent advancements in the research field recommend the low fat diet which is contradictory to the recommendations of Ayurveda.

There is a dilemma between these recommendations about consumption of ghee. Hence such a condition necessitated the study of ghee’s effect on the dhatus. As rasa dhatu is the foremost dhatu which nourishes other dhatus, also, effect of ghrita over rasa dhatu is to forms the vishuddhatara dhatu or pratyagra dhatu. Therefore it has been selected for the study.

REVIEW OF LITERATURE:

Goghrita is considered as best among the jangama sneha's. It promotes smriti, buddhi, agni, shukra and ojas. It is rasayana and chakshu hita. Ghrita alleviates vata due to its snigdha (unctuous) guna, and pitta due to its maduhra (sweetness) and sheeta (coldnesss). It has cooling and softening effect, provides clarity of the voice, and improves complexion. The study of goghrita with its matra, guna, karma etc, and the details of edible fats, daily requirement of fats for adults etc will be done in detail.

Rasa dhatu is the one which does preenana of whole body. Though hrudaya is said to be the sthana, it continuously circulates throughout the body in all directions.

Blood consists of plasma and cells (red cells, white cells and platelets). It is primarily a medium for the carriage of Oxygen, nutrient materials, hormones and antibodies to the tissues and for the removal of Carbon dioxide and other waste products from the tissues and their elimination from the body. Blood plasma is the liquid component of blood in which the blood cells are suspended. Serum refers to blood plasma from which clotting factors (such as fibrin) have been removed.

Serum resembles whey in appearance (transparent with a faint straw color). It is mainly composed of water, blood proteins and inorganic electrolytes. It serves as transport medium for glucose, lipids etc. Its protein content is necessary to maintain the oncotic pressure of the blood which "holds" the serum within the vessels. The Serum consist of Albumin, Globulin, Cholesterol, Triglycerides, Lipase, Lipoprotein, Glucose, Myoglobin, Insulin, Sodium, Urea, Creatinine, Uric acid, Zinc etc.

The lipid profile is a blood test done to assess the status of fat metabolism in the body. This includes measuring lipids and its derivatives known as lipoproteins. Lipoproteins are compounds containing fat and proteins and include free cholesterol, cholesterol esters, triglycerides, phospholipids and Apo proteins.
The study of lipids present in serum was done in detail.

METHODOLOGY

AIM AND OBJECTIVE:

- To analyze the effect on the status of *rasa dhatu* & lipid profile after intervention of *goghrita* (cow's ghee) as a dietary ingredient.

HYPOTHESIS:

Null Hypothesis

1. There is no effect of snigdham ashneeyat (goghrita) on the status of rasa dhatu with respect to its karma, vriddhi, kshaya, and sarata.

2. There is no effect of dietary goghrita on the parameters of lipid profile such as Total Cholesterol, Triglycerides, HDL, LDL, VLDL.

Alternate Hypothesis

1. There is effect of snigdham ashneeyat (goghrita) on the status of rasa dhatu with respect to its karma, vriddhi, kshaya, and sarata.

2. There is effect of dietary goghrita on the parameters of lipid profile such as Total Cholesterol, Triglycerides, HDL, LDL, VLDL.

Inclusion Criteria:

- Individuals having normal lipid profile.
- Both genders.
- Age group-20-40 yrs.
- As mentioned in the classics only ghrita sevanarha persons will be included in the study.

Exclusion Criteria:

1) Individuals with the history of any systemic disorders which affect fat metabolism.
2) Individuals taking internal medication which affects fat metabolism.
3) Women who are consuming oral contraceptive pills.
4) Pregnant and lactating women.
5) Alcoholics and smokers.

MATERIALS AND METHODS:

- ***Literary study***: References from various Ayurvedic classics, other ancient texts, and texts of modern physiology, reputed journals, articles and suitable websites which are relevant was collected and analyzed.

Clinical study

- **A. Level:** It was an Out Patient Department level study.
- **B. Center for the study:** The center for study was taken at Sri Sri College of Ayurvedic Sciences and Research, Bengaluru.
- **C. Number of groups:** The patients were categorized in to two groups.
- **D. Sample size:** The samples / subjects were divided into two groups, in which each group consisted of 50 individuals.
- **E. Duration of the study:** The duration of the study was 1 month.
- **F. Research Design:**
- **G**. **Sample size**: 100**.** The individuals were divided into 2 group**s –** each group consisting of 50 individuals. It is an interventional trial. Individuals following inclusion criteria was selected by judgment sampling method for the study after taking informed consent. Total number of individuals were randomly divided into two groups (using simple random sampling table method), each group containing 50 individuals.

  Group A: was given warm and liquid *goghrita* along with meals in 2 divided doses.

  Group B: was considered as control group and ghrita was not given.

  Goghrita was provided for **30 days** at the dose of 20 ml (**18 gms per day)** to the individuals in Group A. All investigations, *rasa dhatu pareekshana*, and *agni pareekshana* was carried out, before and after the study.

  [In order to maintain uniformity in the diet pattern, a simple diet chart was given to individuals participating in both the groups]

- **H**. **Assessment criteria:** The parameters used in the study are:
    - *Rasa dhatu karma, vriddhi, kshaya, pradoshaja vikara, and twak sara*
    - Lipid profile
    - Harvard step test
    - WHO's Quality Of Life (QOL) assessment questionnaire.

- **I. Source of ghee:** *Ghrita* used in the study was collected from a standardized diary product's firm. Ghee collected was from Karnataka milk federation – Bangalore unit with the brand name "Nandini Ghee".

- **J. Source of data**: Individuals for the study was recruited from various institutions run by SSRVM trust in Kanakapura road, Bengaluru.

ANALYSIS AND INTERPRETATION:

In this intervention study individuals fulfilling the inclusion criteria were selected at random. There were 50 individuals in each group (case and control) age group 20-40 years who participated in this study. Observations were recorded before and after the course of administration of goghrita. As per the specially prepared proforma which includes the demographical and vital data, observations were made regarding the distribution according age, gender, religion, educational status, habitat, diet factor etc. This part contains the description of statistical analysis of the data obtained along with the observation. All observations were tabulated and represented with charts wherever found essential.

Result was assessed based on the data obtained, & analysis of the data was based on the conceptual study and suitable statistical methods.

Discussion was based on the literary research made on the concepts, observations and the results obtained.

Discussion on literature review

Chapter on *sneha*

The etymology of the word *sneha,* is that which brings in lubrication. *Snigdha* is a resultant *guna* of *sneha dravya*, it brings about *kledana*, though the qualities of *ghrita* will be discussed in detail in the next chapter, the general or *samanya gunas* of *sneha* such as *snigdha, mridu, shlakshna* etc are discussed here.

Among the 4 *sneha's* - *ghrita, taila, vasa and majja*, three of them are from animal source. Only *taila* is derived from plant source. *Vasa* is considered as the *sneha* of *mamsa*. (*shuddha mamsa bhava sneha saa vasa parikeertita*). So *vasa* contains more *sadhrmya amsha* of *mamsa*. *Majja* though a type of *sneha*, it is itself a *dhatu*. So the *sukshmata* of *majja* in reaching deeper *dhatus* is much more when compared to other types of *sneha*. *Ghrita* is considered as the best among 4 *snehas* because of the property "*samskarasyanuvartnaat*", which means it attains the property of other substances when *samskara* is given to *ghrita*.

Sneha possess the *sukshma guna*. Though *sneha* is grossly assumed as guru because of the time taken for its digestion at the same time it possess *sukshma guna* also which helps in easy penetration into the minute *srotases* of the body. *Ghrita* is that *sneha dravya* which is having a unique quality ie; it is *swayam agnivardhaka*. Other *snehas* do not possess this quality. This makes *ghrita* one among the best *snigdha dravyas*.

Chapter on *ghrita*

Among the *chaturvidha sneha, ghrita* is considered to be the best by the virtue of its physical properties as well as therapeutic properties. The importance of *goghrita* and its applicability as a drug can be analyzed by noting its uniqueness under the following categories.

1. Physical properties
2. Chemical properties
3. Therapeutic properties
    a) *Doshaharatwa*
    b) *Vyadhiharatwa*

1. Physical properties

A detail study on the derivation of the word *ghrita* reveals that *goghrita* is the one which is a processed and refined form of diary product. The specialty of *goghrita* lies in the fact that a perishable diary product which is either milk or butter is converted into a non-perishable, preserve able edible product. The *goghrita* procured for the purpose of the current study was a standardized diary product from Karnataka milk federation, Bengaluru unit with the brand name "Nandini Ghee".

The information about the above product officially details that the product is processed from clarified butter derived from pasteurized, toned milk.

The *goghrita* used for the intervention was the ghee derived from milk and not from curd.

This throws a light on the fact that the properties which are found in the milk should be also present in the processed product, the ghee. However this is not seen practically and is evident in the form of its physical appearance and composition viz increased *snigdhatwa, mridutwa, sandratwa, shlakshnatwa* and reduced *dravatwa* and *saratwa* as compared to *ksheera*.

2. Chemical properties

Ghee is almost anhydrous milk fat. It is by far the most ubiquitous indigenous milk product and is prominent in the hierarchy of Indian dietary. Being a rich source of energy, fat soluble vitamins and essential fatty acids, and due to long shelf life at room temperature (20 to 400C), 80% of ghee produced is used for culinary purposes. The remaining 20% is used for confectionery, including small amounts consumed on auspicious occasions like religious ceremonies.

Cow's milk is a rich source of carotenoids which attributes to the colour of the ghee whereas, in other animal milk, due to lack of carotenoids e.g. in buffalo milk, ghee prepared from it is white, unlike cow ghee which has a golden yellow color. Because of its pleasing flavor and aroma, ghee has always had a supreme status as an indigenous product in India.

Ghee is obtained by clarification of milk fat at higher temperatures of around 120 °C (250 °F) till the water has cooked off, allowing the milk solids to brown. This process flavors the ghee, and produces antioxidants which help to protect it longer from rancidity. Ghee having more residues is a source of phospholipids and has a longer storage life. Because of this, ghee can be stored for six to eight months under normal conditions.

The detail analysis of the chemical properties brings to our notice that the change in the colour, consistency, and chemical composition is a result of the process involved in the conversion of milk into ghee. In Ayurveda this phenomena is attributed to the process called *manthana samskara*. The *manthana* and *agni samskara* can be considered as a key factor in bringing out the variation of the chemical properties in *goghrita*.

3. Therapeutic properties

By the virtue of physical and chemical properties, *goghrita* differentiates itself among other dairy products and is perceived by the organoleptic properties such as odour, taste, touch, and colour. Apart from the uniqueness in the organoleptic properties, *goghrita* interestingly possess distinctive therapeutic properties as explained in the classical *Ayurvedic* text. The therapeutic effects can be classified into 2 major categories viz,

a) *Doshaharatwa*

Any *dravya* possess *guna* which can be understood as physical/chemical property and an effect which can be either a general action or therapeutic action. *Goghrita* having the *guna* such as *snigdha, sara, mridudrava, shlakshana, sheeta* and *agneyatwa* on interaction with the *doshas* and *dhatus* results in therapeutic actions like *vata pitta hara, kaphakara, brimhana, pushti, balya, rasavardhaka, shukravardhaka, agnivardhana, hladana, ropana, varnya* etc. However it is significant to note that the above therapeutic effects are predominantly favorable in nourishing the *rasa dhatu* as all the above therapeutic effects are conducive to *rasa dhatu*.

b) *Vyadhiharatwa*

Indications of *goghrita* for various diseases as mentioned by various *acharyas* who are the authors of the Indian classical texts reveal the fact that *goghrita* is beneficial for the diseases like *unmada, shotha, jwara, udavarta, anaha, apasmara, visarpa, shiroroga, yoniroga, raktapitta, pandu, agnimandya,* etc by the virtue of its *doshaharatwa* and *dhatu vriddhikara* properties owing to its *samskarasyaanuvatana guna*. This in turn is an effect because of physical and chemical properties present and imbibed in the *goghrita* which is explained logically under the context of *guna* and *karma* in the various classical texts.

Chapter on *Rasa Dhatu*

The study of any physiological entity in an organism includes

i. Its physical existence in a certain form
ii. Structure
iii. Function
iv. Physiological phenomena
v. Pathological phenomena
vi. Pathology leading to a disease condition in the organism.

Its physical existence in a certain form

Physical existence of the components of an organism specifically in the case of a human body, in Ayurveda, is considered under the purview of *dhatu*. Among different *dhatu's*, *rasa dhatu* is one such physical component which is considered to be in the form of a liquid. This is backed by the evidences from the classical texts of Ayurveda. The physical existence of *rasa dhatu* in the form of a liquid makes this *dhatu* functionally potent to travel all across the body with the help of the *doshas*.

Structure

Components of human body are expected to be in a certain structure, macroscopically and microscopically. However in case of *rasa dhatu* macroscopic structure is defined in the classical texts of Ayurveda and the microscopic structure can be comprehended with the help of the functional phenomena explained under the context of conversion of the *dhatus*.

Function

Any physical component in the body will express its existence and is perceived by its function. *Rasa dhatu* being one of the components which expresses its existence in the form of a liquid has some innate functions like *saratwa, dravatwa, apdhatutwa, snigdhatwa/sneha, sukshamatwa*. These functions will be helpful in physiological functions of the same *dhatu*.

Physiological phenomena

A physiological phenomenon of *rasa dhatu* includes its origin as a component of the human body. The classical Ayurveda texts mention the origin of *rasa dhatu* from the *ahara rasa* which in turn is a product of appropriate metabolism. The conversion of the *ahara rasa* into a refined component called *rasa dhatu* can be understood from the literature of *vaishehsika darshana*. The conversion of a certain physical component having certain functions gets converted into a structurally and functionally different component with the help of a process called the *pilupaka*. The process of the *pilupaka* includes physical as well as chemical change. However this involves the influence of another component called the *vijatiya tejas* which comes in the form of rasa *dhatwagni*. Hence the conversion of *ahara rasa* into *rasa dhatu* happens with the influence of the *rasa dhatwagni*. This physiological phenomenon

helps the *rasa dhatu* to obtain the properties which are the cause for the functions mentioned above.

Pathological phenomena

Pathology indicates any variation from the normalcy; this is termed as *vikriti* or *dushti*. Any *dushti* can occur in 2 forms.

1. Quantitative
2. Qualitative

Quantitative

The quantitative *dushti* can be understood as *vriddhi* and *kshaya*. Though the increase or decrease in quantity are not perceived directly (by *pratyaksha*) still it can be inferred through the *vikritaguna* and *karma* (*vriddhi* & *kshaya lakshanas*)

Qualitative

The *praoshja vikaras* can be understood as caused due to qualitative disturbance in a *dhatu*.

Pathology leading to a disease condition in the organism

Though all the pathologies are conditions apart from normalcy, not all pathologies can be termed as diseases. The stage of *vriddhi* and *kshaya*, though pathological are capable of producing disease only if they enter the stage of *sthanasamshraya*. (Finding an association with *dhatu* and localizing at a particular site.)

Chapter on lipid profile.

Lipids are a class of organic compounds that are fatty acids or their derivatives. They have many functions in the body – forms the basic structural components of cell membranes, acts as energy reserves, act as signaling and regulating molecules.

In the present case study *goghrita* was administered along with food for a period of 30 days. *Goghrita* contains triglycerides, diglycerides, mono glycerides, ketoacid glyceride, glycerylesters, free fatty acids, phospholipids, sterols (cholesterol), etc. Hence lipid profile was evaluated as objective criteria before and after intervention.

Lipid Metabolism

The digestion of lipids takes place in the mouth, stomach and small intestines through the enzymes Lingual lipase, Gastric lipase, pancreatic lipase, Cholesterol Esterase and Phospholipase A2. Lingual lipase and gastric lipase breaks down the fat molecules there by initiating the process of digestion, has a slower activity than the pancreatic lipase. Pancreatic lipase acts on the emulsified fat molecules in the duodenum. Cholesterol Esterase and Phospholipase A2 act on cholesterol and phospholipids respectively. The main end products of lipid digestion are: 2 monoacylglycerides, 1 monoacylglyceride, glycerol, fatty acids, cholesterol, lysophospholipids.

The end products of lipid digestion are absorbed into the blood either directly through intestinal cell or through lymphatic vessels. Lipid molecules in the form of triglycerides, phospholipids and cholesterol esters are transported in the body through chylomicrons and other lipoproteins.

Chylomicrons have highest concentration of triglycerides, HDLs have higher concentration of proteins and lesser concentration of fat molecules; LDLs have higher concentration of cholesterol whereas VLDLs have higher concentration of triglycerides.

Lipid profile evaluates the serum concentrations of cholesterol, triglycerides, lipid carrier proteins majorly high density lipoproteins, low density lipoproteins and very high density lipoproteins in milligrams per deciliter. As end products of fat metabolism are attached to lipoproteins and transported freely in the blood to its target areas, serum is separated from the uncoagulated blood to evaluate Lipid profile hence the name serum lipid profile.

II. Discussion on Materials and methods.

Goghrita is a widely used product as both food and medicine in Ayurveda. The properties and effect of *goghrita* have been explained remarkably by all *Acharyas*. Though *goghrita* is explained as a *nitya sevaniya dravya* its effect on consumption on a daily basis is always questioned owing to the fact that fatty food is related to incidence of hyperlipidemia and other disorders. In this regard, the present study entitled "STUDY OF SNIGDHAM ASHNEEYAAT WITH THE INTERVENTION OF GOGHRITA (COW'S GHEE) IN RELATION TO THE STATUS OF RASA DHATU AND LIPID PROFILE" was undertaken towards the aim of evaluating the physiological effect of *goghrita* on lipid profile and the qualitative assessment of *rasa dhatu* in an honest way within the available limited sources and feasibility.

A cohort clinical trial was carried out on a sample size of 100 who fell under the inclusion criteria. They were divided into two groups of 50 each with simple random sampling method. Group A: was given warm and liquid *goghrita* (18gm /day) with meals in 2 divided doses. Group B: was considered as control group. Both the groups were given a simple diet chart to maintain a uniform diet pattern. The participants for the study were taken from SSCASR campus because the food which is being supplied from ashram will help in maintaining the uniformity in the diet pattern. The diagnostic and assessment criteria's including subjective and objective parameters were examined before and after 30 days of intervention. Harvard step test was included as an objective parameter for evaluating the cardiac efficiency as *hrudaya* is considered as the *moola* of *rasavaha srotas*. The acquired data was tabulated and subjected to statistical analysis through "paired t test", Annova and Pearson chi square test and other tests as per requirement.

III. Discussion on Observation & Results

The present study was conducted on 100 individuals who were divided into case and control group consisting of 50 persons in each group. Among them for the case group *goghrita* was administered whereas in control group nothing was given. The diet pattern in both the groups was similar. Both the subjective and objective parameters were assessed before and after the study. The following parameters are discussed below.

Age

The participants who took part in the present study belong to an age group of 20- 40 years. This factor in relation to the present study was not statistically significant.

Gender

Among the 100 study participants 60 of them were females and remaining 40 of them were males. The gender of the participants in relation to study was found to be statistically not significant.

Religion

All the study participants both in the trial and the control group belonged to the Hindu religion. It is usually noted that in Hindu religion dietary supplement of ghee is well accepted. This was one of the factors which contributed for the feasibility of administration of ghee.

Occupation

As the study was conducted in the campus of Sri Sri College of Ayurvedic science and research hospital, participants were selected from the same campus who were UG students, PG students, physicians, school teachers, laboratory technicians, students of solar energy training center, & persons working with transport department. Occupation did not show any significance in relation to this study.

Diet

The study participants include both vegetarians and non-vegetarians. Among them though vegetarians were in greater number this factor was found to be not significant in the current study. This indicates that dietary consumption of ghee had no role to alter the effect in individuals in relation to vegetarian and non-vegetarian food.

Frequency of diet

This factor was found to be highly significant statistically. The frequency of diet and also the type of food substances consumed by the individuals who were taken as participants were not altered during the study to avoid any kind of bias as altering the frequency of diet consumption would probably bring changes in the metabolism.

Weight

Weight of the participants was measured before and after administration of *goghrita*. While comparing the means it was observed that in both groups there was a slight increase in weight.

Slight increase in weight was seen in both the groups which were found to be Significant is probably by the virtue of increase in absorption and assimilation due to factors like increased appetite & humidity of the environment. Increase in the appetite could be a contribution of consumption of ghee in the case group as *ghrita* is known to be *agni deepaka dravya* which may cause increase in the amount of food intake which might cause *brimhana* effect on our body. In control group, factors such as humidity might be contributory. *Snigdha guna* has got *kledana shakti* which might be the probable reason for increase in weight in control group.

Harvard step test

The Harvard step test which was conducted before and after the trial for assessing the cardiac efficiency of the study participants of both the group; it was observed that in case group there was a slight increase in cardiac efficiency and a decrease in efficiency was observed in the control group.

The movement of *vata* in presence of sneha is said to be *asajjamana* which means the flow of *vata* will be feasible in the presence *sneha*. Therefore *vyana vayu* being a sub type of *vata* having its scope all over the body and its predominant seat in *hrudaya* (heart) is aided for its *prakrita karma*. This phenomenon was evident in the case group.

In the control group as there was no supplementation of dietary ghee, there was probably deficit of *snigdhaadiguna*, leading to reduction in cardiac efficiency. Meanwhile it is observed that the cardiac efficiency has decreased and the fundamental reason behind this could be slight increase in weight.

Discussion on *Rasa Dhatu Karma*

Tushti* and *Preenana

According to the *siddhanta ksheenaah vardhayitavyam*, Tushti and *Preenana* which is one among the *rasa dhatu karma*, in the case group were found to be statistically highly significant. In the control group there was no change in this *lakshana* among the participants and hence was statistically not significant.

By *swabhava* it is seen that the factors which are at the optimal level are maintained even with the increased usage of the corresponding enhancing factors, whereas the factors which are in deficiency are brought to normalcy with the usage of the corresponding enhancing factors. Meanwhile with the absence of corresponding enhancing factors the entity remains as it is.

So this might be the reason that the control group did not show any changes whereas there was significant increase in *tushti* and *Preenana karma* of *rasa dhatu* in case group.

Raktapushti

Raktapushti karma of *rasa dhatu*, was found to be statistically highly significant in the case group and in the control group there was no change in this *lakshana* among the participants and hence was statistically not significant.
Dietary ghee is considered as the best form of sneha.

Snehadravya, by the virtue of its properties like *drava, snigdha, mriduguna* are similar to the properties of *rasa dhatu*. Therefore dietary consumption of ghee will lead to increase in *rasa dhatu* by *samanyasiddhanta*. This has 2 aspects.

i. *Rasa dhatu* and *rakta dhatu* share similar properties such as *sara, drava, eeshat snigdhata*. Therefore *rasa pushti* will contribute for *raktapushti* simultaneously.

ii. By *ksheera dadhi nyaya*, it is understood that the preceding *dhatu* will nourish the subsequent *dhatu*.

In the control group, absence of the supplementation of sneha might be the reason for no change in the status of *raktapushti*.

Discussion on *Rasa Dhatu vriddhi lakshanas*

Agnisada

Agnisada which means reduction in the capacity of digestive fire was statistically found to be very highly significant& it was not found to be statistically significant in the control group.

Ghrita is *sheeta, snigdha* but *agneya* in nature by the virtue of its *samskara*. Therefore it has the capacity to increase the *agni*. Meanwhile the factors responsible for the digestion include *ushma ,vayu, kleda, sneha, kala* & *samayoga*. Among the above *ghrita* not only has *sneha guna* but simultaneously can aid for *anna kledana*. Therefore 2 significant factors responsible for the process of digestion is contributed by the use of dietary ghee. This might be the probable reason for relieving *agnisada*.

In the control group, absence of the supplementation of sneha might be the reason for no relief in *agnisada*.

Praseka

As *praseka* is *lakshana* of *vikruta kapha, ghrita* helps to rectify the *kapha dosha*. This *lakshana* was found to be reduced significantly.

Alasya

Ghrita by virtue of its *guna* does provide *pushti* to *shareera* which is helpful in increasing the energy level which helped to overcome *alasya* in the case group individuals. As in control group due to absence of *ghrita* supplementation significant changes were not observed.

Gourava

Ghrita does *agnivardhana*. *Gourava* is an *ama lakshana*. As treatment of *ama* is nothing but *agnivardhana,* so by using *ghrita gourava lakshana* was overcome.

Shwaitya

Shwaitya is one of the presentations of *varna vikriti* and *varna prasadana* is one of the functions of *ghrita*. Hence there is absence of *shwaitya* in case group though it was not significant statistically. In control group as there was no supplementation of ghee this effect of *ghrita* is found to be absent.

Shaitya

Sheeta is specific property of *ghrita*. So there was no change in both the groups.

Angashaithilya

As *ghrita* possesses the *rasayana* property this helps to overcome the *shaithilyata* of *anga* or *dhatus* because of this property it helps to build each and every *dhatu* to become more *prashasta* and each and every *anga* is made up of *dhatus*.

Shwasa* and *Kasa

Ghrita is *agni vardhana dravya*. So it is acting on *amashaya*. As *kasa* and *shwasa* are the 2 symptoms which require *agni vardhana chikitsa* and *ghrita* posess this property of *agnivardhana* that's why it works. It was not found to be significant because the duration of supplementation of ghee might not be sufficient to bring significant changes.

Atinidra

Intake or non-intake of *ghrita* has no role over *tamoguna* which is the root cause of *nidra*. Hence the finding is non-significant.

Rasa kshaya lakshanas

Roukshya

Rasa kshaya (depletion) *lakshanas* were assessed before and after trial in both the case group and control group participants.

As *ghrita* is known for its *snigdha guna* by the virtue *gunavisheha* of *samanya vishesha siddhanta* it reduces *roukshya lakshana*.

Shrama

Ghrita being a lipid substance is well known for its rich calories. So intake of ghee definitely brings down *shrama* which was seen in trial group significantly. Because of lack of supplementation of *ghrita* there was no change seen in the control group.

Shosha

Ghrita is derived from *ap mahabhuta* so it is nourishing in nature. So it combats *shosha* by providing the necessary element which is required. Due to absence of supplementation this was not found to be significant in control group.

Glani

Ghrita by virtue of its *karma* is *tarpana* in nature. This might be the probable reason for overcoming *glani* in the trial group which was found to be highly significant. Absence of supplementation of *ghrita* in the control group might be responsible for non-significant change was in the control group.

Shabdaasahishnuta

Rasa dhatu comprises of predominantly water element. In *rasa kshaya lakshana* as *rasa dhatu* decreased from body that means water element from body is depleted. By *samnyavishesha siddhanta* for managing it we need to supply water element which is predominantly present in *ghrita*. Hence these *lakshanas* including

shabdaasahishnuta was found to be relieved. In the control group as the *ap mahabhuta* has not been taken care of, the *lakshanas* were not relieved and it was found in more number of individuals.

Discussion on *Twak sara lakshana*

Among the *twak sara lakshanas snigdha, shlakshna* and *prabha* were found to be highly significant and *shlakshna* as very highly significant statistically among the case group other *lakshanas* like *mridu, sukshma, alpa, gambheera sukumaraloma* etc were statistically not significant.

Acharya Charaka has metioned *twak sara lakshana* instead of *rasa sara lakshana*. This means to say that there exists a close relationship between *rasa* and *twak*. When the *gunas* of *rasa dhatu* are being well nourished, it results in the formation of good quality *rasa dhatu*. So in turn *twak* also gets nourishment from the same. The requisite for rasa or *twak* nourishment is already present in *ghrita*. Many *acharyas* like *Acharya Charaka*, *Acharya Kashyapa* and in *Kaiyadevanighantu varna prasadana* is one among *ghrita karma's*. So by considering all these we can probably say that by consumption of *ghrita*, there is proper formation of *rasa dhatu*, and proper nourishment of *twak* which has led to improvement of *twak sara lakshanas* in the trial group, whereas in the control group as *ghrita* was not supplemented, *sara lakshanas* were not found to be statistically significant.

Discussion of *Rasa pradoshajavikara*

Rasa pradoshajavikara was assessed among the study participants before and after the study.

Discussion of non-significant features of rasa *pradoshajavyadhi* symptoms

For all these disorders *rasa dhatu* is one among the *dushya* but cannot be considered as the only *dushya*. Hence administration of *ghrita* in the said quantity and duration is probably not sufficient to overcome these *lakshanas*.

Discussion of significant features of rasa *pradoshajavyadhi* symptoms

Ashraddha, Aruchi, Agninasha

Ghrita possess the property of *agnideepana* and these 3 symptoms are directly depending upon status of *agni*. So as *ghrita* is correcting the *agni*, probably these symptoms shows significant outcomes.

Tandra

When the individual cases of case group is considered, 11 people had *tandra* and after treatment this was absent in all individuals. Hence the result was statistically highly significant. As consumption of *ghrita* increases *agni*, it also works as supportive elements to *indriyas* which will result in *prachurata* of their respective *karya*. That means to say the keenness of *indriya* functioning will increase and since *agni vardhana* effect will imply clarity in srotases, this *lakshana* of *tandra* was absent after treatment in case group. But in control group before treatment it was 14 and after 1 month it increased to 16 persons in the group. As *ghrita* was not supplemented to this group its beneficial effect in bringing *prachurata* to the *indriyas* was not seen and hence *tandra* increased.

Angamarda

Due to the consumption of *goghrita*, which possesses *snigdha*, *shlakshna guna*, it does *vata shamana* which probably helps in relieving *angamarda lakshana*.

Gourava* as in *pradoshaja vikara* & *Srotorodha

For relieving *gourava* & *srotorodha*, which is also one of the major symptom of *ama*, *agnivardhana* is most important treatment modality. *Ghrita* helps to improve the *agni*, hence probably *srotorodha* was relieved which was significant.

Discussion on Lipid Profile

Probable mode of action of *ghrita* on lipids:

Total Cholesterol

When both the means of before trial and after trial among the case group are compared there is a highly significant reduction seen in the total cholesterol level. When the means of before trial and after trial among the control group are compared there is an increase in the cholesterol level. When the change in between these groups and within the groups were measured using ANOVA test it was found to be statistically very highly significant.

Agni is a major component for any transformation. It view of total cholesterol - *jataharagni, bhutagni* and *dhatwagni vyapara* is at its normal functional capacity. The cholesterol in the diet which is administered for the case group, stimulates the liver cells for its incorporation in forming the bile acids. Bile juice and its constituents

are a major asset for digestion, absorption and excretion of fats. This can be explained as follows:

- ♣ Digestion- the dietary lipids is being acted upon by the bile juice in the intestine and after emulsification done by bile salts, it is rendered for the action of pancreatic lipase and other enzymes. After the enzymatic action it is rendered into the monomer forms.

- ♣ Absorption – The action of ACAT enzyme at the level of intestinal cells and the action of LCAT enzyme at the level of serum to incorporate these monomers into lipoproteins like LDL and VLDL and then transported through blood for storage in adipose tissue.

- ♣ Excretion – The cholesterol which is brought to the liver is being utilized for production of hormones, formation of bile acids which helps in excretion of cholesterol.

Hence secretion of more bile accounts for the decreasing cholesterol value.

The cholesterol oxides in the *goghrita*, decreases ACAT activity in the intestinal mucosal cells, thereby reducing the uptake of cholesterol. Liver is producing the cholesterol optimally as there is reduced dietary uptake. There by maintaining the levels of cholesterol in the blood. Probably this may send a negative feedback signal so that excess cholesterol production in the liver does not happen at the same time the cholesterol level in the blood may send a negative feedback signal to ACAT to reduce the uptake as it serves as a regulator of intracellular cholesterol homeostasis.

The decrease in total cholesterol in this study shows the equilibrium between its digestion, absorption and excretion. By this we can understand the *jatharagni*, *bhutagni* and *dhatwagni* is functioning well. Along with it even the optimal function of samana and *vyana vata* can be understood.

Triglycerides

The study participants were given a common diet chart which restricted the ingestion of calories. In the case group whatever food which was consumed was getting converted to their monomers after digestion & was completely utilized for

their respective functions. As the transportation of triglycerides is bidirectional in the blood, lipid profile just measures the amount of triglycerides which is present in the blood and does not differentiate between the triglyceride which is brought from the adipose tissue for metabolism or the one which is being taken towards the adipose tissue for deposition. By the statistically highly significant reduction seen in the triglyceride level we can understand, there was no added calories which was getting converted into triglycerides, at the same time, the fat metabolism absorption, storage and utilization, is in equilibrium.

HDL – High Density Lipoprotein

The means of before trial and after trial among the case group when compared showed an increase seen in the high density lipoprotein level. When the means of before trial and after trial of the control group were compared there was a reduction in the high density lipoprotein level. The change within the group was not significant and the change between the groups was found to be statistically highly significant.

The lipoproteins like HDL helps in transportation of the *sneha* from periphery to the liver for further metabolism and excretion of cholesterol. The main functions of HDL are -

i. They accept cholesterol from peripheral tissues and other lipoproteins → carry to the liver where cholesterol is metabolized and excreted via bile.

ii. HDL donates various apolipoproteins including apo - C to chylomicron and VLDL. The triglycerides of chylomicron and VLDL can be hydrolysed by lipoprotein lipase only after they (= chylomicron and VLDL) have acquired apo - C.

iii. HDLs also accept various apolipoproteins from other lipoprotein particles.

Lipoproteins carry the *snehamsha* to different parts of the body. In the body any movement is by the influence of *vata* and transportation in particular is because of *vyanavayu* which does the transportation of nutrients simultaneously all over the body.

After the digestion of go*ghrita* along with *ahara* (*snigdha ashana*) the *ahara rasa* which is formed is transported from one *dhatu* to the next. *Ahara rasa* which is

transported in the *srotases* gets transformed to the respective *bhoutika amsha* by its *bhoutikagni* and gets absorbed and metabolized by the respective *dhatus* and *dhatwagnis* thereby nourishing it.

HDL carries the *snehamsha* from the tissues and brings it to the liver for further metabolism. By the intake of *goghrita* the *agni* which has increased helps in the formation of good quality *ahara rasa*, which in turn nourishes all the *dhatus* through their respective *dhatuvaha srotases*, i.e., as explained in *khale kapota nyaya*. This indicates that the functional efficiency of *agni*, lubrication in the *srotases* have been improved, there by facilitating the movement of *vyanavayu* without any obstruction.

The increase in HDL can be understood that the *agni* has improved based on the observations that whatever food which is consumed is properly being metabolized by *jatharagni* and there is no extra storage of energy in the form of adipose tissue, at the same time it indicates the utilization of stored energy by bringing it to liver for further catabolism. Hence it shows that the *medo dhatwagni* has become *deepta*.

Thus this gives a direct indication that *jatharagni* is having better efficiency after intake of *ghrita* and the rise in HDL concentration after trial is a beneficial effect.

LDL – Low density lipoprotein and Very low density lipoprotein (VLDL)

The means of before trial and after trial among the case group when compared showed a reduction in the low density lipoprotein level. When the means of before trial and after trial of the control group were compared there was an increase in the low density lipoprotein level. When the change in between these groups and within the groups were measured using ANOVA test it was found to be statistically very highly significant.

The study participants were given a common diet chart which restricted the ingestion of calories. The digestion is optimal thereby the absorption is proportional to the ingested calories. At the same time we can also understand that there is no conversion of extra calories into fat which gets stored. This justifies the reduction in the levels of LDL and VLDL as these are the lipoproteins which carry triglycerides and cholesterol to their storage areas. This shows that the *agni vyapara* is happening at its maximal functional capacity.

As we see the physiological functions carried out by lipids, most of them we can correlate it to the functions of *rasa dhatu*. So we can understand that the effect of *ghrita* in the body, though it has brought in reduction of the values of lipid profile except HDL, the functions it carries out is being optimal. So in that way, we can say that the *rasa dhatu* is improving functionally.

Discussion on *Abhyavaharana Shakti* and other Components of *Agni Pareeksha*.

Abhyavaharanashakti

The status of *abhyavaharanashakti* (food intake capacity) was checked whether it was *pravara*, *madhyama* or *avara*.

To know the sustenance of the results when analyzed before, after and at the end of 1 month, it was observed that 4 individuals had the same status of *abhyavaharana shakti* after treatment also, whereas 46 participants showed improvement in the case group. In the control group all the participants had same status of *abhyavaharana shakti* after trial also with no any reduction in its status. So this was statistically very highly significant.

Jeerna lakshanas

Jeerna lakshanas of *ahara* were assessed before and after the study. Following were the outcomes

Abhyavaharana Shakti as well as *jeerna ahara lakshanas* is directly dependent upon the quality of *agni*. If *agni* is proper and if it is improved, *abhyavaharana shakti* as well as *jeerna ahara lakshanas* are seen improved properly in the individuals. Being *agnivardhan* is one of the most important characteristic feature of *ghrita* in *abhyavaharana shakti pariksha* and *jeerna ahara lakshana pareksha*. Hence in case group almost all features is seen improved significantly.

Benefits of *snigdha bhojana*

Benefits of *snigdhabhojana* were assessed before and after the study. Following were the outcomes

Bhujyamaanam Swadate

Bodhaka kapha and *goghrita* possess *samana bhavas* such as *snigdha, shlakshna, drava ,mridu* etc *gunas*. As *ghrita* does *upachaya* of *kapha* which includes *bodhaka kapha* also, this helps in enhancing the taste of the food.

Agni Udirana* and *Kshipra Jara

The *ushna, teekshna, laghu* qualities of *agneya pitta* are overcome by *sheeta, manda, guru* qualities of *ghrita*.

In treatises ghee has been described to alleviate *pitta* and increase *agni*. Here *pitta* is *agneya* matter and *agni* also in the body is not available anywhere else other than *pitta*. Hence Sushruta says –

"Na khalu pitta vyatirekatanyoagnihupalabhyate"

Thus *agni* is supposed to be a part of *pitta*. All *dravyas* which increases the *agni* also increase the *pitta*.

Here the question arises as to why *ghrita* does not follow this rule.

A study of the difference in the qualities of the *pitta* and *agni* will reveal that the *pitta* is only an *agneya dravya* but not the *agni* itself.

Pitta	***Agni***
Snigdha	*Ruksha*
Fluid	Not fluid, not solid
Taste - *katu, amla*	No taste
Smell of raw meat	No smell

The *panchabhoutik* composition of *agni* (*jatharagni*) is having the predominance of *agnimahabhuta* whereas the *pitta* is having the predominance of *Ap* and *Prithvimahabhuta* along with *agnimahabhuta* which can be attributed to the qualities of fluidity and taste which the *pitta* has. Thus in the body *pitta* and *agni* are the two different *mahabhoutik* entities. Similarly the *pitta* has the qualities of *rasa, gandha* etc while *agni* hasn't. Hence these two can be increased or decreased irrespective of each other.

Even when it is so, *ghrita* has the qualities like *sheeta* etc. which obviously may subdue *agni*. Then the question arises as to how *ghrita* is capable of *agnikaratwa*.

Agnikaratwa means, *agni- udeerakatwa*.

a) By decreasing the unwanted qualities like *ruksha, khara, chala*, etc of *samanavayu* due to *snehadi gunas* of ghee, the latter performs the functions of *prakriti sthapana* and hence helps *samana vayu* to inflame the *agni*.

b) Also *ghrita* itself acts as a fuel for combustion and helps in burning. By consumption of *ghrita* along with *ahara* as in "*snigdham ashneeyaat*" the *ghrita* helps in prolongation of the action of *agni* i.e; for longer duration. The very function of *sneha*, according to *Nyaya* philosophy is said as "*dahanukulam*".

Darshanashastra also believes that *ghrita* increases *agni*. They give yet another reasoning that *agni* is *panchabhoutik* and *apyagni* gets *bala* from *ghrita* due to *samanagunanyaya*.

Grahani is also said as *pittadharakala*. *Grahani* is the chief organ which receives *ahara* and it is in this region *annapachana, shoshana* and *sara kitta vibhajana* takes place. *Ghrita* provides *bala* to *grahani* and thereby does *agni vardhana* and helps in *kshipra jarana prakriya*.

Vatanulomana

As *goghrita* is having *snigdha, sara, mridu gunas* and it is also a *agni vardhaka* it facilitates *vatanulomana*.

Indriya Dhardhya

It is a known fact that intake of *goghrita* causes *shareeropachaya* and *balavardhana*. As the *indriyas* are one among the *shareera ghatakas*, it also improves the *indriya dardhyata* as similar effect is seen in *shareera* also.

Shariropachaya* and *Bala

Ghrita is having the *gunas* such as *snigdha, guru, picchila* etc. *Acharya Sushruta* explains the function of these *gunas* as *balakrit*. *Hemadri* explains the function of *guru guna* as the one which provides *pushti* to the *deha*. Also these *gunas* does nourishment of *kapha* so the *bala* also increases. *Kapha* provides *bala* to the *shareera*. Hence it is also called as *balasa*.

Varna

Acharya Sushruta mentions four *karmas* for *snigdha guna* present in *sneha dravyas* among which *varnakara* is also one. While explaining the functions of *pitta,* it is stated that the production of normal and abnormal colour of the skin is due to *pitta*. Chakrapani in his commentary has stated that these functions belong to the *bhrajaka pitta*. *Bhrajaka pitta* is located in the skin. Dalhana explained that *twak* is understood as the *bahyatwak* known as *avabhasini*. There is difference in the structure of the skin as explained by *Charaka* and *Sushruta*. According to *Sushruta,* the skin has seven layers, the first layer is called *avabhasini* and it serves to reflect all colours and is capable of being tinged with hues of all the five *mahabhutas*. The other six layers are *lohita, shweta, tamra, vedini, rohini, mamsadhara*.

The functions of *bhrajaka pitta* are as follows

1) Production of normal colour of the skin.

2) Maintenance of the lusture or complexion of the skin is by the *paka* (transformation or conversion) of the absorbed substances.

Goghrita is having a rich source of carotene. This imparts the yellow colour to the ghee. Intake of *sneha* nourishes all the fatty depositions present in the body. Therefore the subcutaneous fat layer also gets nourishment and further deposits the carotene. Because of the above said reasoning intake of *ghrita* is said as *varnya*.

Discussion on WHO assessment of quality of life

Domain 1

This section contains the questions related to the physical welfare of a being**.** The questions framed in this section includes information regarding various areas like pain, energy, sleep, mobility, activities etc. There was an improvement seen in the means when compared between the means of before trial and after trial. This suggests that in case group there was improvement in the physical wellbeing of the individuals with the consumption of ghee and in control group this improvement was not seen.

By virtue of the *gunas* of *ghrita* like *agni deepana, vatanulomana, mridukara, brimhana, ojovardhaka, balya rasayana, pushti, jeevana* etc the *ahara rasa* which is well formed is being transported in the *srotases* without any obstruction, hence all the *dhatus* are receiving proper nourishment. Thus the physical attributes like daily

activities, sleep, energy for daily activities etc have improved with the consumption of *ghrita*.

Domain 2

This section involved the questions regarding the psychological related areas such as, positive feelings, thinking, self-esteem, body image, negative feelings and spirituality. In the second domain, the means of the two groups when compared, we can see an increase in the means of the case group after the trial compared to before trial which was found to be statistically highly significant. This suggests that consumption of ghee had a positive effect in the case group regarding the psychological domain involved in the participants of the current study. In the control group, no difference in the means was observed.

Owing to the *gunas* of *ghrita* like *mridu, sukshma, snigdha* etc and *karmas* such as *vapusthairya, ayuhita, alakshmihara, medha vardhaka, buddhivardhaka, smriti karaka, rasayana ojovardhaka* etc both *manasika* and *shareerika swasthya* has improved. Thus the phychological attributes such as thinking, positive feeling, self-esteem, etc have improved with the consumption of *ghrita*.

Domain 3

This domain consisted of questions related to how the individual maintained social relationships such as personal relation, social support, sexual activity etc. The changes in the means of the case group after trial was highly significant and no changes were observed in control group.

Owing to the *gunas* of *ghrita* like *mridu*, *madhura*, *sukshma*, *snigdha* etc and karmas such as *vapusthairya*, *ayuhita*, *alakshmihara*, *medha vardhaka*, *buddhivardhaka, smriti karaka, vrishya, rasayana, prajakamahita, shukra shodhana*, *yoni shodhana, ojovardhaka* etc both *manasika* and *shareerika swasthya* improves making an individual present himself healthy , sound and thriving with good personal and social conduct. Thus the social relationships such as personal relations, social support and sexual activities, etc have improved with the consumption of *ghrita*.

Domain 4

This domain consisted of questions related to the environment in which the person is living. Questions were based on areas such as safety, financial status, services availability, information, leisure, transportation etc. The changes in the

means of the case group after trial was highly significant and no changes were observed in control group.

Owing to the *gunas* of *ghrita* like *snigdha, mridu, sukshma*, etc and *karmas* such as *alakshmihara, rakshoghna, medha vardhaka, vapusthairya, ayuhita, buddhivardhaka, smriti karaka, ojovardhaka, rasayana* etc both *manasika* and *shareerika swasthya* has improved. The way an individual responds to the outside stimulus has improved positively which shows the *satwa guna* of the *manas* has improved. Hence the daily hurdles, challenges, disappointments which he/she comes across is not affecting his mental status and is still happy and satisfied within oneself. Thus the environmental attributes such as financial status, services availability, information, etc have improved with the consumption of ghrita.

Thus with the observation of all the above subjective and objective parameters it can be said that "Snigdham Ashneeyaat" which is mentioned as one among the first rule for consumption of ahara is found to be highly beneficial in the good quality formation of rasa dhatu and also bringing about beneficial changes in the lipid values of the individuals.

CONCLUSION:

After discussion, outcome of the study was concluded.

In the current study it has been observed in the case group that because of administration of ghee following were the outcomes.

- There was optimum level of rasa dhatu karma
- Vriddhi and kshaya lakshanas were brought back to normalcy
- Pradoshaja vikaras was reduced to a very great extent.
- Total cholesterol, Triglycerides, LDL, VLDL concentration reduced
- HDL (Good Cholesterol) concentration increased
- There was no change in rakta sara lakshanas.
- Harvard step test suggests good health of heart or increased cardiac efficiency
- There was an improvement in all the domains which assessed the quality of life of an individual
- All the above mentioned details were not found in control group.

KEY WORDS:

Ghee, Rasa Dhatu, Total Cholesterol, Lipid Profile

CONTENTS

LIST OF TABLES

LIST OF CHARTS

LIST OF GRAPHS

ABBREVIATIONS

- च.सं. – Charaka Samhita
- सु.सं. – Sushruta Samhita
- अ.सं. – Ashtaanga Sangraha
- अ.हृ. – Ashtaanga Hrudaya
- भे.सं. – Bhela Samhita
- का.सं – Kaashyapa Samhita
- हा.सं. – Haareeta Samhita
- यो.र. – Yoga Ratnaakara
- भा.प्र. – Bhaava Prakaasha
- शा.सं. – Shaarangadhara Samhita
- मा.नि. – Maadhava Nidaana
- भै.र. – Bhaishajya Ratnaavali
- श.क.दृ. – Shabda Kalpa Druma
- सू – Sutra Sthaana
- नि – Nidaana Sthaana
- वि – Vimaana Sthaana
- चि – Chikitsaa Sthaana
- Su. - Sushruta
- Ch. - Charaka
- As.H - Asthanga Hrudaya
- Ka. - Kashyapa
- Sha. - Sharangadhara
- Su. - Sutra
- Chi. - Chikitsa
- Si. - Siddhi
- Utt. - Uttara

INTRODUCTION

Food is considered as *prana*[1] or vital force for which all the living beings aspire. Anything which fills up the stomach to free from hunger cannot be called as food. Food should constitute of taste, colour, smell, & touch as per the likings of that person & it should be ingested according to the rules and regulations for taking food[2] as said in Ayurveda classics, only then the person gets the benefits. Food provides various health benefits such as happiness, mental satisfaction, colour and complexion strength, nourishment, memory[3] etc. Presence of all these qualities in food serves the purpose of consuming it.

Ghee is considered to be an integral part of the human diet in India since ages. Rate of consumption varies according to region, and individuals. The nutritious and therapeutic value in ghee is good. Ayurveda suggests the use of cow's ghee as best among other ghees[4].

Every food item we consume encounters with *agni* and results in the formation of *ahara rasa* and thus *rasa dhatu*. Even the ghee consumed will be making an entry in to the *rasa dhatu* thus circulating all over the body.

Rasa which is considered as the *aadya dhatu* continuously circulates and forms the *aadhara* for nourishment of consecutive *shad dhatus*. *Rasa* circulates along with *rakta dhatu* all throughout the body[5].

Blood is said to be the basic component in the formation of life. Blood constitutes of plasma and cells (red cells, white cells and platelets) [6]. The ubiquitous distribution of blood in the body and its exclusive chemical characteristics make it a most efficient transport system.

Serum[7] refers to blood plasma which is devoid of clotting factors (such as fibrin). It is transparent with a faint straw colour and resembles whey in appearance. Serum is mainly composed of water, blood proteins and inorganic electrolytes. It serves as transport medium for glucose, lipids, amino acids, hormones, metabolic end products, carbon dioxide and oxygen.

Lipid profile[8] is a set of blood tests that suggests abnormalities in lipids, (if any) such as cholesterol and triglycerides.

The current study is an effort to explore the effects of *goghrita* on *rasa dhatu* keeping bio chemical changes in lipid values as a parameter.

Need for study:

People now a days are having sufficient knowledge regarding the risk factors of health. They know about the familial risk factors for diabetes mellitus, obesity and cardiovascular disorders thus, they totally avoid intake of ghee.

In Ayurveda it has been said that *goghrita* is one of the *nitya sevaneeya aahara dravya*[9]. Among the *dwadasha ashana pravichara* the rules mentioned for consumption of *ahara*, "*snigdham ashneeyaat*"[10] is one of them.

This process of consuming *ghrita* along with *bhojana* is fading out leading to increase in *rukshata* inturn leading to *vata vruddhi* which may have manifold implications on various aspects of health of the individual, ultimately reducing the quality of life. But, recent advancements in the research field recommend the low fat diet which is contradictory to the recommendations of Ayurveda. There is a dilemma between these recommendations about consumption of ghee.

Hence such a condition necessitated the study of ghee's effect on the *dhatus*. As *rasa dhatu* is the foremost *dhatu* which nourishes other *dhatus*, also, effect of *ghrita* over *rasa dhatu* is to form the *vishuddhatara dhatu* or *pratyagra dhatu*[11]. Therefore it has been selected for the study

LITERARY REVIEW

CHAPTER -1 : SNEHA

Historical aspect

Vedas are considered as the oldest recorded documents, wherein lies some of the earliest record of the diseases and treatment of mankind. In Rigveda – the word '*ghrita*' is used as a synonym for the nutritious diet. Description regarding ghee and its capacity to inflame *agni* are available in the chapters of nutrition.

In Atharvaveda, *ghrita* has been much complimented but there is hardly any information regarding *snehapaka*, etc.

Purana

In Markandeya purana, *ghrita, taila, vasa* and *majja* were quoted as *sneha dravyas*[12]

Classical age

In Kashika, *panchakarma* seems to be a common method of treatment prescribed along with *purvakarma* such as *snehana, swedana* and *pashchat karma – anna samsarjana* etc. Ghee was also advised to take with meals.

In Harshacharitra, it is quoted that *snehana* and *swedana* were used commonly, the former to pacify *vayu* and the latter to relieve hardness and eliminate doshas from the body.

In Shankara bhashya – ghee mixed with gold was given to the child orally before taking breast milk.

Etymology of the word *sneha*

The word *sneha* is derived from the root '*snih'* by the addition of '*ghai'pratyaya*.[13] It has two meanings. One being "*snih –preetau*"[14] means to render affection and the other "*snih- snehane*"[15]meaning to render lubrication.

In Ayurvedic texts, the word *sneha* has different meanings in different contexts. It represents:

1. A character of property or quality (*guna*)[16]
2. Essence (*sara*)[17]
3. Affectionate[18]
4. One of the eight active principles[19]
5. A classification of shadow[20]
6. Any sneha substances like *ghrita, taila, vasa, majja* etc
7. Lubricator

Synonyms of *sneha*[21]

1. *Prema*
2. *Hardam*
3. *Dohadam*
4. *Iccha*
5. *Akanksha*
6. *Spriha*
7. *Trishna*
8. *Vancha*
9. *Lipsa*
10. *Manoratha*

Snigdha

Snigdha is a word to denote a *guna* present in a *dravya* and it indicates the presence of *sneha* in it. The quality which is capable of promoting *bala, varna, kanti, snigdhata* and *mridutwa* in the body is called as *snigdha*.[22]According to Hemadri, *snigdha* is a *guna* capable of rendering *kledana* in the body.

Synonyms of *snigdha*[23]

1. *Vayasya*
2. *Sa vayah*
3. *Mitram*
4. *Sakha*
5. *Suhrit*
6. *Sakhyam*
7. *Saptapadeenam*
8. *Anurodha*
9. *Anuvartanam*
10. *Picchila*
11. *Vijilam*
12. *Samsrishtam*
13. *Chikkana*
14. *Masrina*

Snehana

The word *snehana* is derived from the root *snih* + *nich* + *lyut pratyaya*.[24]*Snehana* is a word to denote the therapy which promotes mainly *snigdha guna* in the body. The term *snehana* is used only for external application of *sneha* to the body in the text Shabdastoma mahanidhi whereas in Ayurvedic texts it is often used for internal administration also.

Definition

"Snehanam sneha vishyanda mardavam kledakarakam"[25]

The procedure by which *snigdhata, vishyandana, mridutwa* and *kledana* are brought about is known as *snehana*. It also alleviates aggravated *vata*, softens the body and dislodges the *doshas* which are adherent to the walls of the srotases.

Sources of *sneha dravyas*[26]

There are two sources of *sneha dravyas* viz.

1. Plant source (*sthavara*) and
2. Animal source (*jangama*)

The one which is derived from *vanaspati* (plant source) is called as *sthavara sneha*. Among them the best one is considered as *tila taila*. The herbs from which *sneha* is extracted is called as *snehashaya*. *Sneha* which is derived from the animal source is called as *jangama sneha*. It includes curd, milk, *ghrita, vasa*, *majja,* etc., which are all animal products. *Ghrita* is said to be the best among all the *jangama snehas* because it is having a special property of adaptability, i.e., '*samskarasyanuvartanam.*'

SNEHA GUNAS- PROPERTIES OF *SNEHA*[27, 28]

The properties of the drugs that are mostly employed in the *snehana* therapy are as follows-

1. *Snigdha* (unctuous)
2. *Guru* (heavy)
3. *Sheeta* (cold)
4. *Mridu* (soft)
5. *Drava* (liquid)
6. *Picchila* (slimy)
7. *Sara* (fluid)
8. *Manda* (sluggish)
9. *Sukshma* (subtle)

The drugs which possess the above qualities are used in *snehana* therapy.

Snigdha guna

The term *snigdha* is derived from the root "*snih bandhane*" which means to hold together or to bind. It is the adjective of *sneha* which generally means viscous. It brings about compactness in all the dhatus of the body. It is *chakshugrahya guna,*i.e., can be identified by naked eyes.[29]*Snigdha guna* is predominantly constituted with *Ap* and *Prithvi mahabhutas*.[30]

Sushruta has stated four *karmas* of *snigdha guna*[31]

1) *Snehakrit* 2) *Mardavakrit* 3) *Balakrit* 4) *Varnakrit*

Snigdha guna is the cardinal property of *sneha dravyas*. The modus operandi of any *sneha dravya* is by this *guna* itself. It is opposite to *ruksha guna*. *Snigdha guna* is *vatahara*, *kaphakara* and *vrishya*. This *guna* also helps in *sangraha*, *pindikarana*, etc. By the help of this *guna*, even up to the subtle level *snehana*, *kledana*, and *vishyandana* will be done to the body tissues.

Guru guna

Generally the term *guru* means heaviness. Those dravyas which undergo delayed digestion[32]by *jatharagni* and produce heaviness of the body are known as *guru*.

The action of *guru guna* are-

1) *Sada* 2) *Upalepa* 3) *Balakara* 4) *Tarpana* 5) *Brimhana*[33]

Sada generates *glani* in *shareera,* i.e., exhaustion. By consuming *guru dravyas* it causes *agnisada* and *angasada*. It does *upalepana* also, i.e., it increases the *mala*. *Balakara* means which increases the strength of the body. Dalhana has opined as *kapha vriddhikara*. By *guru dravyas* (*guna*) both *bala* and *kapha vardhana* takes place. It is *tarpana* means that which causes satisfaction or *triptijanaka*. *Brimhana* means *deha vriddhikara*. Hemadri defines *guru guna* as that which has the capacity to cause *brimhana,* i.e., which nourishes is known as *guru*. This *guna* is *vatahara, kaphakara, pushtikara* and difficult for digestion. It is chiefly constituted with *prithvi mahabhuta*.[34, 35, 36]

Sheeta guna

Sheeta is the quality which provides coldness. This *guna* produces the following actions.

1) *Hladana*
2) *Stambhana*
3) *Murchaharana*
4) *Trishna prashamana*
5) *Sweda harana*
6) *Daha prashamana*[37]

The quality which increases pleasure and joy is *hladana. Sheeta* causes *sankocha,* i.e., contraction/constriction. It causes stambhana. Here *stambhana* should be understood as *dridhata* of *mamsa,*etc., done by *sneha* and not as to cause *avarodha*. *Sheetaguna* relieves *trishna, sweda, daha*. It is predominantly constituted by *apya* and *vayu mahabhuta*.[38]Those which are *snigdha* and *sheeta*, are predominantly of *apya mahabhuta*, and those which are *ruksha* and *sheeta*, are predominantly of *vayu mahabhuta*. *Sneha dravyas* are *apya mahabhuta* dominant. *Sheeta guna* incrases *kapha* and *vata*, and helps to increase the dhatus. This property is perceptible through tactile sensation (*sparsha grahya*).[39]

Mridu guna

Mridu literally means softness. It is predominantly composed of *Ap* and *Akasha mahabhutas*.[40]Arunadatta and Hemadri both have explained this *guna* as that which causes the *shaithilya* (looseness) of the *avayava.* This *guna* increases *kaphadosha* and does the *shamana* of *pitta*. It brings about the *shaithilya* in tissues, softens the *srotases* and loosens the *malas*. It is a *sparsha grahya guna*. [41]

Drava guna

The literal translation of the word *drava* is fluidity. The *guna* which brings moistness and which is having the liquefying and dissolving capacity is defined as *drava guna*.[42, 43,44]*Drava guna* diffuses all over the body, even upto the minutest particles. Hemadri clarifies that the quality which has *vilodana* capacity is *drava*. Because of *drava guna, sneha* travels easily all over the body. It causes *dosha vilayana* and increases *sravana shakti* thereby increasing mobility. *Drava guna* is predominant of *Apmahabhuta*[45]and is perceivable by *chakshu*. It increases *kapha, pitta, rasadi dhatus, and mutra* etc.

Picchila guna

It means sliminess, or sticky in nature. Hemadri defines the substances which are having the quality of *lepana,* i.e., smearing or coating is known as *picchila*. Arunadatta has explained *picchila guna* as *Sandra*. It is primarily constituted by *Ap mahabhuta*.[46, 47, 48]This *guna* is perceivable by *chakshu* and *sparsha*.[49]

Sushruta has stated five actions of *picchila guna.*[50]

1) *Jeevana* - That which does the maintenance of *ayu*. Its action is in *raktadi dhatus*.
2) Increases *bala*.
3) *Sanghata nirmana* - Building up compactness in body tissues from micro to macro level
4) Increases *kapha* thereby increasing *bala*.
5) Brings heaviness / *guruta*. This *guna* is said to be *guru,* i.e., heavy for digestion and brings heaviness in the bodily tissue elements.

Sara guna

Sara means mobility. The property which brings about *anulomana* is called *sara*.[51]This *guna* helps in the movement of *dosha*, *dhatu* and *malas* and also help in the evacuation of *vata*, *mutra* and *pureesha*. Hemadri defines that the property of *prerana* is called as *sara*. In Charaka and Sushruta samhit*a*s *saraguna* has been defined as opposite *guna* of *sthira* whereas in Ashtanga Hridaya and Sangraha the opposite *guna* of *sthira* is *chala*. But some of the authors consider *chala* and *sara gunas* as synonyms. *Chala guna* cannot be attributed to *sneha dravyas* because it is having *vayu mahabhuta* predominance. Hence *sara guna* is quite suitable for *sneha dravyas* which is predominantly constituted with *Ap mahabhuta*. [52]

Manda guna

Manda guna is expressed in terms of time taken for execution of action which is very late /delayed. [53]*Manda* means dullness. Hemadri says that which does *shaman* is known as *manda*. By this, *sneha* spreads slowly all over the body and does *shamana*. This *guna* present in *sneha* helps it to maintain contact with *dosha, dhatu* and *mala* for long duration. This *guna* is having the predominance of *Prithvi* and *Ap mahabhuta*.[54, 55]This guna is *kapha vardhaka* and *pitta shamaka*.

Sukshma guna

The meaning of the word *sukshma* is subtle, or fine, or minute. The *guna* by which the substances have the capacity to enter even into minute pores of the *srotas* is known as *sukshma*.[56]Hemadri defines it as having the capacity to produce *vivarana*. This is described as *avagahaka* which can percolate deep into the body. *Sukshma guna* has got great importance in *sneha dravyas*. By this *guna*, *sneha* attains the capability to enter the *dhatuvaha srotases*. This *guna* increases *vata* and *rasadi dhatus*. It produces desiccation of *malas. Sukshma guna* is predominant of *Agni*, *Vayu* and *Akasha mahabhutas.*[57, 58]

BHOUTIKA SANGHATANA

All the drugs and diets are composed of *panchmahabhutas*. Although, *Sneha* are considered as *panchabhoutic* in composition, they are predominantly constituted by *apya mahabhuta*. The qualities such as *snigdha, sheeta, manda, sara, mridu, picchila* which are present in *sneha dravyas* are the properties of *Ap mahabhuta*. *Sukshma* and *mridu gunas* are the properties of *Akasha mahabhuta* and *guru guna* is the property of *Prithvi mahabhuta*. So we may justify that *sneha* is of *apya mahabhuta* predominance.

In *sneha dravyas agni guna* is diminished but it should not be understood as *abhava*. Because the very definition of *sneha* by Nyaya, is said as '*yadvashat dahanukulam,*' i.e., that which is conducive for combustion. It is seen that by *sneha, agni vriddhi* takes place. *Sneha* consists of both *apya* and *agneya guna* which is quite contradictory to each other. But according to *siddhanta* and *tatwa* it is not *viruddha*. If *sneha* is given *samskara* with *ushna dravyas,* it acts as a potent *agnivardhaka*.

It is explained that, the *tridoshas, saptadhatus* and *malas* increases by the use of substances possessing homologus properties, and decreases by the use of antagonistic substances, i.e., substances possessing opposite properties. *Panchabhoutic* configuration of the above mentioned *gunas* are shown in the table.[59, 60]

Table No 1

Panchabhoutic configuration of the *gunas* of *sneha*

Guna	***Bhoutikata***	**Sensorial perceptibility**	***Bhoutika shareera dravya***	***Shareera karya***
Snigdha	*Apya*	*Chakshu*	*Rasa, rakta, mamsa, meda, majja, shukra, vasa, kapha, mutra etc.*	*Snehana, ahladana, kledana, bandhana, vishyandana.*
Guru	*Parthiva*	—	*Nakha, mamsa asthi, danta, mala, kesha,shmashru, loma, khandara etc*	*Sthairya, sanghata, bala, upachaya etc.*
Sheeta	*Apya, Vayavya*	*Sparsha*	*Rasa raktadi, apya, asthi, mamsa, vayu, twak etc*	*Hladanadi apya, vaishadya, laghava, shwasa, prashwasa, akunchana prasaranadi.*
Mridu	*Nabhasa*	*Sparsha*	*Anu srotas, maha srotas, shrotra, amashaya, pakwashayadi, mridu avayava.*	*Mardavata, shaithilyakara, laghavakara.*
Drava	*Apya*	*Chakshu*	*Rasa, rakta, mutra, shukradi.*	*Prakledana, alodana.*
Picchila	*Apya*	*Sparsha*	*Rasa, meda, vasadi, majja, shukradi.*	*Bala, sanghata, jeevana, gouravakara.*
Sara	*Apya , Agneya*	*Chakshu*	*Rasadi, rakta, pitta, prabhadi*	*Snehadi, pachana, varna, prakashanadi.*
Manda	*Apya*	—	*Rasadi*	*Snehadi.*
Sukshma	*Nabhasa*	—	*Sukshma srotas, maha srotas, indriya*	*Sukshma sroto pravesha soushiryakara.*

From the above table it is obvious that the quantity of *Ap mahabhuta* present in *sneha* is maximum. Thus it can be said that *snehas* are *Ap mahabhuta pradhana*.

Due to this quality only, *snehas* are lubricating and *kledakara* and protects the body from early wear and tear. It is essential that even a machine needs oiling off and on, so that its parts work properly.

CLASSIFICATION OF SNEHA

Sneha is of various types. It is classified as follows based on various parameters.

I. According to *yoni*[61, 62]

Yoni means the source of origin or *utpatti*. It is of two types. They are

1. *Sthavara sneha* - Plant source
2. *Jangama sneha* - Animal source

Sthavara sneha

That which is derived from *vanaspati* (plant source) is called as *sthavarasneha*. *Tila taila* is considered as the best among them. The herbs from which *sneha* is extracted is called as *snehashaya*.

Jangama sneha[63]

Sneha which is derived from the animal source is called as *jangama sneha*. It includes curd, milk, *ghrita, vasa, majja* etc. *Ghrita* is said to be best among all the *jangama snehas* because it is having a special property of adoptability, i.e., '*samskarasyanuvartanam.*'

II Based on action [64, 65]

Based on action it is of three types. They are

1. *Shodhanasneha*
2. *Shamanasneha*
3. *Brimhanasneha*

1. ***Shodhana sneha*** - It is of two types. They are

   i. *Sneha* used for proper *shodhana karma,* i.e., *vamanopayogi, virechanopayogi snehas*etc.

ii. *Sneha* employed as the preparatory procedure for *shodhana karma*. It is to be given in more quantity, in the morning when the previous night meal gets digested.

2. ***Shamana sneha***

The one which will neither increase nor expel, but mitigates the *doshas* is called as *shamana*. The *shamana sneha* is administered when the person feels hungry. It is given in *madhyama matra*.[66, 67]

3. ***Brimhana sneha***

The *sneha* which is administered for the *brimhana* of the body is called as *brimhanasneha*. It is given with *mamsa*, *madya* or meal in *alpa matra*.[68]

III. Based on *matra* (dose)

Based on *matra*/dose it is of four types.[69, 70, 71]They are

1. *Hrasiyasi*[72]
2. *Hraswa*
3. *Madhyama*
4. *Uttama*

IV. Based on *paka*[73]

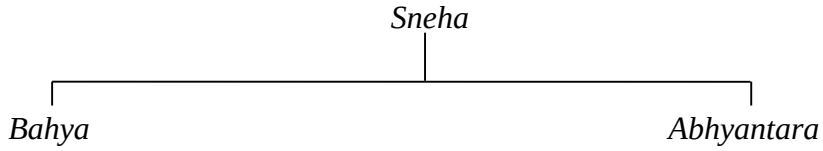
Based on the *snehapaka* it is of three types. They are

1. *Mridupaka*
2. *Madhyamapaka*
3. *Kharapaka*

V. Based on method of usage

Based on the mode of usage it is of two types.[74, 75] They are

1. *Bahya*
2. *Abhyantara*



a. *Abhyanga*
b. *Lepa*
c. *Udvartana*
d. *Mardana*
e. *Samvahana*
f. *Padaghata*
g. *Murdhataila*
h. *Gandusha*
i. *Karnapurana*
j. *Akshipurana*
k. *Parisheka*
l. *Pichu*

a.*Pana*
b.*Bhojana*
c.*Nasya*
d.*Basti*

VI Based on mode of intake

According to mode of intake *sneha* are classified into two groups. These are

1) *Acchasneha*[76]
2) *Vicharanasneha*[77]

VII According to combination[78]

Based on the combination of *sneha* it is of three types. They are

1) ***Yamaka sneha*** – the combination of two *snehas* e.g. *sarpi + taila, taila+ majja* etc.

2) ***Trivrit sneha*** - the combination of three *snehas* e.g. *sarpi + taila+ vasa, vasa + majja+ taila* etc.

3) ***Maha sneha*** - the combination of four *snehas* e.g. *sarpi + taila+ vasa+ majja*

SNEHA PARIPAKA – ACCORDING TO AYURVEDA

The knowledge of digestion and assimilation of *sneha dravyas* is very important. But in Ayurveda, the *paka krama* of *sneha* is not vividly explained by *Acharyas*. Hence no clear references are available about the digestion of *sneha dravyas*. However the process of *sneha* digestion can be studied on the basis of *sneha jeeryamana* and *jeerna lakshanas*.

The body is the outcome of food. The healthy and unhealthy conditions of the body depends on the status of digestion. To understand the digestion process of *snehas* reference has to be taken from the process as described by Charaka.[79, 80] Any food item cannot be assimilated without proper elementary level digestion. This process is to be performed by three types of *agnis*, viz *jatharagni, dhatwagni* and *bhutagni*.

In nut shell –

The food,i.e.,*vijateeya* form

Parinamana ↓ By means of *jatharagni* and its representatives in *dhatus* etc.

Sajateeya form

Parinamana ↓ *Dhatwagni* and *Bhutagni*

Formation of the body tissues

Agni digests the four types of *ahara*[81] and provides energy for sustaining life. It protects body from wear and tear. Hence *agni* performs both the functions of digestion and metabolism.

Jatharagni

Jatharagni is the leader of all factors concerned with digestion and metabolism in the body. The activities of all the normal and abnormal factors are dependent upon an increase or decrease of it.[82] The term *jatharagni* stands for and

comprise of several enzymes involved in the digestion of the different components of food. It is mainly concerned with chemical processes involved in gastro-intestinal digestion.

According to Charaka, the food which has reached the *amashaya* (stomach and small intestine as *urdhwa* and *adhoamashaya*) after undergoing digestion is absorbed and distributed to all *ashayas* in the body through *dhamanies*.[83]

Here the term *dhamani* literally means the channels of internal transport. Absorbed food is transported through small *srotases* of intestine which proceeds to *yakrit*, from where it is transported to the *hridaya and* it is distributed to all parts of the body through circulation.

The factors which take part in digestion of food stuffs in *koshtha* are as follows[84]

1. *Ushma*
2. *Vayu*
3. *Kleda*
4. *Sneha*
5. *Kala*
6. *Samayoga*

1. ***Ushma-*** *Ushma* is the main factor which converts the food into assimilable form.

2. ***Vayu***– Particularly *samanavayu* helps *agni* to digest food by bringing the food stuffs near to it and carrying the digested part.

3. ***Kleda*** – The digestion of food is possible after softening of the food with the help of *drava guna* of diet articles and digestive juices including saliva. Soft food breaks into fine particles easily which can be digested smoothly. Absorption and assimilation of water soluble food contents is easier.

4. ***Sneha*** – It is said that the consumed food should have little or moderate quantity of *sneha*. It helps in absorbing *sneha* soluble substances from the *koshtha*. It enhances digestive power.

5. ***Kala*** – For proper food digestion certain time period is required and this depends upon the qualities of the food ingested e.g. *laghu, guru, mridu, kathina* etc.

6. ***Samayoga*** – *Samayoga* means the proper combination or co-ordination of all the factors related to *ahara* which makes the *aharahita* and *pathya*.

Bhutagni

According to Ayurveda, *bhutagnipaka* follows *jatharagnipaka*. Digestion of food by *jatharagni* leads to the *sanghata bheda* or breakdown of the former into five distinct physiochemical groups viz *parthiva, apya, tejasa, vayaviya, nabhasa*. The *agni amsha* present in the substances belonging to each group is said to digest the substance of that group, bringing about a drastic change in its qualities: *vailakshanya guna*.[85]

Thus food substances are rendered fit for being assimilated into the corresponding *bhoutika shareera dravya*.

According to Sushruta, the food consisting of five *mahabhutas* is in turn digested by the *bhutagnis* and each of its principles proceeds to increase its own analogue in the human organism[86].According to some the reactions comparable to *bhutagni paka* takes place in *yakrit* and not in *amashaya* which drives the support to the post digestive functions and metabolic events in liver as per modern physiology and biochemistry.

Proceeding on the basis of Ayurvedic principle that the general (similar) or *samanya* classifies and the particular (dissimilar) or *vishesha* differentiates, [87]a *parthiva* substance can alone contribute to an increase of *parthiva* constituent of the body. *Sneha* is said to be *apya* substance. So it increases the *apya* constituent in the body. According to V*a*gbhata, *sara – kitta vibhajana* takes place after the completion of *bhutagni paka*.

Dhatwagni

The specific *agni* corresponding to each *dhatu* is called as *dhatwagni*. *Dhatwagni paka* is stated to metabolize the products of *bhutagni paka*. *Rasa*

dhatwagni is said to help in the synthesis of several constituents of *rasa dhatu*. Similarly the constituent formation of *rakta dhatu* is catalysed by *rakta dhatwagni* and likewise in cases of *mamsa, meda* etc. The nutrients that support the body are subjected to *paka* again, acted upon by the seven *dhatwagnis,* leading to the formation of *dhatus* through their respective *srotases*. [88]

The substances produced are known as *asthayi* or *poshaka dhatus*.[89] *Dhatwagni paka* is said to have two aspects-

a) *Prasada paka* and
b) *Kitta paka*

The end products of *prasada paka* are utilized for the nourishment of *dhatus*, whereas, those of *kitta paka* provide the materials for the formation of various kinds of excretions such as *sweda, mutra, pureesha, vata, kapha, karna-nasa-asya-romakupa malas* etc. [90] The *prasada* fraction is transported by *rasa* → *rakta* – and so on to the next dhatus. The final synthesis of *asthayi dhatus* into *sthayi dhatus* takes place in *dhatu* themselves by the help of *dhatwagnis*.

Stages of *sneha paripaka*

There are three stages of *sneha paripaka*. They are as follows.

Madhura Avasthapaka

The change in the state or form of food substances in *amashaya* and *pakwashaya* in course of digestive process is known as *avasthapaka*. Two phases of this *paka*, the *prapaka* and *vipaka* has been explained. The *prapaka* has been defined by Chakrapanidatta as *prathama paka*.**[91]**These changes have been described in terms of the *rasa* or taste of the end products of gastro intestinal digestion viz *madhura, amla* and *katu*.[9**2**]

Prapaka commences from the time, the food is introduced into the mouth. This aspect of digestion in the upper portion of *urdhwa amashaya* attains *madhura bhava*. The next event which takes place is *vibhajana* of food by the *tejas* element of *lalasrava*. The movements are brought by *prana vayu*. [9**3**]

Amla avasthapaka

The second phase, i.e., *amla avasthapaka* involves the *vidagdha avastha* of food. The term *vidagdha* has been interpreted by Chakrap*a*nidatta as '*pakwapakwam*' or '*kinchit pakwam kinchit apakwam,*' i.e., partly digested and partly not digested.[94]As the partly digested food which has attained *amla bhava* is moved down, *accha pitta* is secreted.[95]The term *amla* refers to the production of *pitta* under the influence of *ahara* which has since assumed *amla bhava*. The food reaches to *pittashaya*.

Katu avasthapaka

The third aspect of *avasthapaka* is the *katu bhava*. This aspect relates to pungent nature of the reactions that occur in the *pakwashaya*. Charaka opines that the material passed down from the *amashaya* having reached the *pakwashaya* is dehydrated and converted into lumps by heat and pungent gas is being produced in this process. [96]

Chakrapanidatta has observed that the term *shoshana* used by Charaka instead of *pachana* is significant. The former relates to the dehydration of food residues which has been brought to *pakwashaya* whereas the later refers to the food digestion in the *amashaya* by *agni*. The phrase '*paripindita pakwasya*' according to him refers to the process of formation of fecal lumps. The phrase '*vayusyat katubhavatah*' describes the production of pungent gas. [97]*Pakwashaya* is the seat of *vayu* where *panchatma vayu's* are produced. According to Sushruta, the separation of *rasa*, *mala* and *mutra*is brought about by *pachaka pitta*. Sharngadhara and Bhavamishra have stated that the *sara bhaga* is known as *rasa* and the *sara heena bhaga* is *mala bhaga*. The latter fraction is transported to *vasti* through *siras* and is converted to *mutra*.

The molecular qualities and properties of three kinds of end products of *jatharagnipaka* are

1. *Madhura rasanus- guru, snigdha, mridu, sheeta*
2. *Amla rasanus- laghu, snigdha, teekshna, ushna*
3. *Katu rasanus- laghu, ruksha, teekshna, ushna*

Chakrapani while commenting on the action of *sneha guna* on *madhura, amla* and *lavana rasa's* has written that these *rasa* even after undergoing *nishthapaka* will be having *snigdha guna* in them which causes easy evacuation of *vata*, *mutra* and *pureesha*. As per Chakrapani and Arunadatta, the *paka* of *sneha* takes place in *pakwashaya*. This fact has been mentioned while dealing with the action of *anuvasana basti*, gives a strong voice to say that *sneha* is digested in *pakwashaya* more than in any other part of the digestive system.

In Ayurveda, mode of digestion has also been agreed for where sequential digestion process may not take place. Many drugs may directly reach to the deeper *dhatus*. Such drugs include *vrishya yogas*.

Thus it can be said that- while *sneha* is taken internally, it may be changed in each stage of digestion.

The *sneha* after *pachana* goes through the same chain. This internal assimilation process is explained in old classics as *dhatwagni* and *bhutagni vyapara*. The *sneha pachana* requires the assimilation in the *dhatus* – where the *sneha* has to perform the function of *dosha shamana* or *dosha shodhana* accordingly.

Ghrita is one of the *ahara dravya*. So according to "*rasapradhanam aharadravyam, veerya pradhanam oushadham*", it will follow the same path of assimilation and will go from *dhatu* to *dhatu*.[98]But exception exists in following two cases-

1) If it is imposed with some other medicinal properties, i.e., *siddha* or *samskarita sneha kalpana*, it will be diverted to the destination accomplished to the specific *veerya- karmukata* of the drugs.

2) If *sneha poshakamsha* are more than the threshold in *rasa dhatu* , this extra quantity will directly reach to the deeper *dhatus* like *meda, majja* etc.[99]

In case of *brimhana sneha, khale kapota nyaya* is more suitable because here the *dhatus* pick up only its *poshaka bhaga*. *Dhatus* are *poshya* and *poshaka* is the site of action rendered to *sneha*. The *poshaka dhatu* in *srotas* when acted upon by

respective *dhatwagni* and *bhutagni* will play supportive or nutritive role for *poshya dhatu.*

Necessity of *sneha* digestion

Sneha dravyas are not present in the nature of body elements, i.e., it is *vijateeya*. These are to be converted into the structure of the body and made suitable for assimilation, i.e., *sajateeya*. *Sneha* as it is cannot be absorbed through the *pakwashaya* even after assuming the form of *sajateeyatwa*.

The size of the *sneha dravya* should be minute, then only it is absorbed, i.e., *sukshmatwa* of *sneha* is necessary. By the digestion of *sneha* it becomes *sajateeya* and anu or *sukshma* by the action of *agni*, which is later absorbed into the body structures which modify the *sneha* according to their necessity for their buildup and function.

Anupana also influences the digestion of *sneha*, warm water is used in case of *ghrita* which is *sheeta veerya* to make it quick dispensible. *Taila* being *ushnaveerya dravya* is followed by *yusha*. *Manda* being *laghu, deepana,* and *vatanulomana* will promote quicker digestion for *vasa* and *majja* which are heavy for digestion. Thus *anupana* plays an important role by its virtues.[100]

The ingested *sneha* after internally absorbed in the body will increase *snigdha guna*. Seven *dhatus*, in which *snigdha guna* is a co- existent factor, will become strong and grow rapidly due to the additional *sneha guna* of the *sneha dravya* used. However it should be noted that there is a threshold of assimilation of *sneha* in the body.

The mode of consuming *sneha* has an important role in rendering *snehana*. Thus *avastha*, *prakshepa*, *anupana*, *sevanakrama,* etc., also plays an important role in influencing the action of *sneha dravya*.

CHAPTER 2 : GHRITA

Historical glimpse

Veda*kala*

In Atharvaveda the role of *ghrita* in ritual fire, i.e.,*havana* has been mentioned. It has been said that *ghrita* is responsible for *agnivriddhi*.

"Ghritam ne agni divye sadyasthe ghritenatwam manuradhasamindhe"
"Ghritam ne vevinitya havahantu ghritam tubhyam duhwam gavo agne"[101]

In this text the word *ghrita* is used as a synonymfor *teja*.

Also there is a prayer which goes as 'please bring the ghee for human beings, since it dwells in the holy place of fire'.

"Sa sinchani gavaksheeram samajyena balam rasam"
"Imam goshtham idam sado ghritenasyanatsamukta"
"Ghritasya dhara madhumat pavantam"

By these and such other verses *ghrita* has been much complimented. But again there is hardly any information regarding preparation of ghee and *snehapakas*. Only one verse is available.

"Karabham kritwa tiryapeevasyamudathim"
"Kshudha klitwa dushtaneejakshivantsanarurupah"

The word *ghrita* has been used as a synonym for the nutritious diet derived from cow's milk.

Description is available in the chapters of nutrition and also the capacity of the *ghrita* to inflame the *agni* has been described. [102]

Br*a*hmana grantha

In this treatise, the description of butter and fat from goat is available in the context of religious functions, holy fire etc.

Shathapatha brahmana

It has been written that in the process of continuous change the cow's milk is completely transformed into ghee. Further it states that ghee is the body fluid of *tejas* and *prithvi*, and is nourished by clouds. Hence ghee is used for holy fire. In the chapter of discussion between King of Videha and Gautama, the fire has been said to get inflamed by utterance of mere word "ghee."

"Agniresha yadajyam tejovai ghritam va ajyam"

Many such quotations are available stating the equivalence of *ghrita* and *agni*.

Sutra grantha

In the Koushika s*u*tra, in the diseases like *dhanurvata, shareera bhanga*, dominance of *vata*,etc.,the drops of ghee are instilled in the nose.

Nirukti

The word *ghrita* is derived from *"ghriti ghriyate ghri seke anji ghrisibhyah ktah"*[103]

Ghritanishpatti – ghrita is used in the meaning of 'extracted from milk.'

Synonyms of *ghrita*[104]

The various synonyms of *ghrita* according to different *Acharyas* have been shown below.

Table no 2.1

Synonyms of *ghrita* according to various *Acharyas*

Sl.no	Qualities	Amarakosha	B.P	RN	SKD
1	*Ghrita*	+	+	+	-
2	*Ajyam*	+	+	+	-
3	*Havih*	+	+	+	-
4	*Sarpi*	+	+	+	-
5	*Navaneetam*	+	-	-	-
6	*Navodhritam*	+	-	-	-
7	*Navaneetajam*	-	-	+	-
8	*Pavitram*	-	-	+	+
9	*Navaneetakam*	-	-	-	+
10	*Amritam*	-	-	+	+
11	*Abhigharah*	-	-	+	+
12	*Homyam*	-	-	+	+
13	*Ayuh*	-	-	+	+
14	*Tejasam*	-	-	+	+
15	*Pakvanavaneetam*	-	-	-	+

['+' indicates presence and '-' indicates absence]

Origin of *ghrita*

Ghrita is said to be a *jangamasneha* i.e. animal product got by the milk of *gau*(cow), *mahisha, aja, avi, oushtra, ekashapha, manushya*.

Classification

Sneha dravyas belonging to *jangama varga* are classified as natural and manufactured, e.g., meat, milk, *majja, vasa* can be called as natural, where as ghee, butter etc, are manufactured.

I. Hitherto ghee has been classified as- [105]

1. *Dadhyuttha* – Obtained from curds.
2. *Ksheerottha* – Obtained from milk.

One specific nomenclature "*haiyangaveenam*"[106]has been used for the ghee obtained from the curds which is kept overnight. The *santanika* of curds is collected, butter is extracted from itand then ghee is prepared.

II. According to period :

1. *Nutana* – For a period of 1 year after production
2. *Purana* – After 1 year it gets old.

Purana has been further classified into four types

1) *Purana* – Between 1- 10 yrs[107]
2) *Prapurana* – Between 10-100 yrs[108]
3) *Kumbhasarpi*– 100 yrs[109]
4) *Mahaghrita* – After 100 yrs[110]

Pharmacological properties of *Ghrita*

Table no 2.2

Pharmacological properties of *Ghrita*

Rasa	*Madhura*	*Puranaghrita– Amla*
Guna	*Snigdha, sheeta, guru, mridu, sowmya, sukshma, anabhishyandi, alpabhishyandi*	*Puranaghrita - Sara, teekshna,laghu*
Veerya	*Sheeta*	*Puranaghrita – Ushna*
Vipaka	*Madhura*	*Puranaghrita- Katu*
Doshaghnata	*Vata pitta shamaka, kaphakara*	*Puranaghrita – Tridoshanut*
Bhoutikasanghatana	Dominated by *Prithvi* and *Ap*.	
Chemical	100% animal fat.	

composition

Ghrita is said to be the best among all the *jangamasnehas* because it is having a special property of adaptability, i.e., 'samskarasyanuvartanam'. Among all types of *ghrita*, *goghrita* is said be the best.

Qualities of *goghrita*[111]

Table no 2.3

Qualities of *goghrita* according to different *Acharyas*

Sl.no	Qualities	Ch	Su	A.S	A.H	B.P	YR	KN	SKD
1	*Guru*	-	+	-	-	+	-	+	+
2	*Sheeta*	+	+	+	+	+	-	+	+
3	*Snigdha*	-	-	-	-	+	-	-	+
4	*Sowmya*	-	+	-	-	-	-	-	-
5	*Shlakshna*	-	-	-	-	-	-	+	-
6	*Madhura*	-	+	-	-	+	+	+	+
7	*Alpaabhishyandi*	-	-	-	-	+	-	+	+
8	*Anabhishyandi*	-	+	-	-	-	-	-	-

Chemistry [112]

The colour of ghee is yellow to white depending upon the carotene content. Cow ghee contains triglycerides 97-98% , diglycerides 0.25- 1.4%, mono glycerides 0.16-0.0387% , ketoacid glyceride 0.015- 0.018%, glycerylesters0.011-0.015%, free fatty acids 0.1-0.44%, phospholipids 0.2-1.0%, sterols 0.22-0.41%, vitamin A2500IU/100 gms, vitamin D 8.5x10.7gm /100 gms; vitamin E 24 x 10.3gm / 100gms; vitamin K 1x10.4gm / 1100gms. Glycerides in cow ghee are butyric acid 4.5-6.0%, caproic acid 1.0-1.36%, caprylic acid 0.9-1%, capric acid 1.5-1.8%, lauric acid 6-7%, myristic acid 21-23%, palmitic acid 19-19.5%, stearic acid 11-11.5%, arachidic acid 0.5- 0.8% , oleic acid 27-27.5%, linoleic acid 4-5%. Ghee resists spoilage by micro organisms or chemicals. Some animal studies have shown that protein casein present in butter elevates cholesterol, but it is removed along with

water content by heating the butter just over 100^0C to get pure ghee after filtration of the residue. The composition of this residue (pure ghee) obtained from Indian cow, contains moisture 14.4%, fat 32.4%, protein 36% lactose 12%, and ash 5.2%. The melting point of ghee is 35^0C which is less than the normal body temperature. Its digestibility co-efficient or rate of absorption is 96%, which is highest of all oils and fats.

Functions and indications of *goghrita* described by different *Acharyas* have been tabulated in the following tables.

Functions / *karma* of *goghrita* [113]

Table no 2.4

Functions of *goghrita* according to different *Acharyas*

Sl.no	Functions	Ch	Su	A.S	AH	B.P	KA	HA	YR	KN	SKD
1	*Vatahara*	+	+	+	+	+	+	+	+	+	+
2	*Pittahara*	+	+	+	+	+	+	+	+	+	+
3	*Kaphakara*	-	+	-	-	+	-	-	-	+	+
4	*Balakara*	+	+	+	+	+	+	+	+	+	+
5	*Pushti*	+	-	-	-	-	-	-	+	+	-
6	*Jeevana*	-	-	-	-	-	-	-	-	+	-
7	*Brimhana*	-	-	-	-	-	-	-	-	+	-
8	*Rasayana*	-	-	-	-	+	-	-	-	-	+
9	*Vrishya*	-	+	-	-	-	-	+	+	+	-
10	*Tarpana*	-	-	-	-	-	-	+	-	-	-
11	*Vayasthapana*	-	+	+	+	-	-	-	-	+	-
12	*Mridukaraka*	+	+	-	-	-	-	-	-	+	-
13	*Swaraprasadana*	+	+	+	+	+	-	-	+	-	+

14	*Varna prasadana*	+	-	-	-	-	+	-	-	+	-
15	*Papanasha*	-	+	-	-	+	-	-	-	+	+
16	*Rakshoghna*	-	+	-	-	+	-	-	-	+	-
17	*Balahita*	+	-	+	+	-	-	-	-	+	-
18	*Vriddhahita*	+	-	+	+	-	-	-	-	+	-
19	*Prajakamahita*	+	-	+	+	-	-	-	-	+	-
20	*Shukrashodhana*	-	-	-	-	-	+	-	-	-	-
21	*Yoni shodhana*	-	-	-	-	-	+	-	-	-	-
22	*Netrahita*	+	+	+	+	+	-	+	-	+	+
23	*Ayuhita*	+	+	+	+	+	+	-	-	-	+
24	*Vapusthairya*	-	-	-	-	-	-	-	+	-	-
25	*Alakshmihara*	-	+	+	+	+	-	-	-	+	+
26	*Pavitra*	-	-	-	-	-	-	-	-	-	+

Goghrita increases the following components of the body.

Table no 2.5

Components of the body which *goghrita* increases according to different *Acharyas*

Sl.no	**Components**	**Ch**	**Su**	**A.S**	**AH**	**B.P**	**CD**	**KA**	**YR**	**KN**	**SKD**
1	*Rasa vardhaka*	+	-	-	-	-	-	-	-	-	-
2	*Shukravardhaka*	+	-	+	+	-	-	-	-	-	+
3	*Medovardhaka*	-	-	-	-	-	-	-	-	+	+

4	*Agni vardhaka*	+	+	+	+	+	+	+	+	+	+
5	*Ojovardhaka*	+	+	-	-	+	-	+	-	+	+
6	*Kantivardhaka*	-	+	+	+	+	-	-	+	+	+
7	*Tejovardhaka*	-	+	-	-	+	-	+	-	+	+
8	*Lavanyavardhaka*	-	+	-	-	+	-	-	-	+	+
9	*Soukumarya*	+	+	+	+	-	-	+	-	+	-
10	*Buddhivardhaka*	+	+	-	-	-	+	-	-	+	+
11	*Medhavardhaka*	+	+	+	+	+	+	+	+	+	-
12	*Smritivardhaka*	+	+	+	+	+	+	+	+	+	+
13	*Dhee*	-	-	+	+	-	+	-	+	-	-

The conditions in which *ghrita* is indicated are as follows.

Table no 2.6

Indications of *goghrita* according to different *A*charyas.

Sl.no	**Indications**	**Ch**	**Su**	**A.S**	**A.H**	**B.P**	**CD**	**KA**	**HA**	**YR**	**KN**	**SKD**
1	*Visha*	+	+	+	+	+	-	+	-	-	+	+
2	*Unmada*	-	+	+	+	+	-	-	-	-	+	+
3	*Shotha*	-	-	-	-	-	-	-	-	-	-	+
4	*Jwara*	-	+	-	+	+	+	-	+	-	+	+
5	*Udavarta*	-	+	-	-	+	-	-	-	-	+	+
6	*Shula*	-	+	-	-	+	-	-	-	-	+	+
7	*Anaha*	-	+	-	-	+	-	-	-	-	+	+
8	*Vrana*	-	-	+	-	+	-	-	-	-	+	+
9	*Kshaya*	-	-	+	+	+	-	-	+	-	+	+

10	*Visarpa*	-	-	+	+	+	-	-	-	-	+	+
11	*Apasmara*	-	+	+	-	-	-	-	-	-	-	-
12	*Kshata*	+	-	+	+	+	-	-	-	-	+	-
13	*Ksheena*	+	-	+	+	-	-	+	-	-	+	-
14	*Shastrahata*	+	-	+	+	-	-	+	-	-	+	-
15	*Agni hata*	+	-	+	+	-	-	+	-	-	+	-
16	*Murcha*	-	-	+	-	-	-	-	-	-	-	-
17	*Shiroroga*	-	-	+	-	-	-	-	-	-	-	-
18	*Karnaroga*	-	-	+	-	-	-	-	-	-	-	-
19	*Netraroga*	-	-	-	-	-	-	-	+	-	-	-
20	*Balakshaya*	-	-	-	-	-	-	-	+	-	-	-
21	*Yoni roga*	-	-	+	-	-	-	-	-	-	-	-
22	*Granthi*	-	-	+	-	-	-	-	-	-	-	-
23	*Nadi*	-	-	+	-	-	-	-	-	-	-	-
24	*Krimi*	-	-	+	-	-	-	-	-	-	-	-
25	*Raktapitta*	-	-	-	-	-	-	-	+	-	+	-
26	*Ajeerna*	-	-	-	-	-	-	-	-	-	+	-
27	*Shrama*	-	-	-	-	-	-	-	+	+	-	-
28	*Kamala*	-	-	-	-	-	-	-	+	-	-	-
29	*Pandu*	-	-	-	-	-	-	-	+	-	-	-
30	*Vibandha*	-	-	-	-	-	-	-	+	-	-	-
31	*Visuchika*	-	-	-	-	-	-	-	+	-	-	-
32	*Arochaka*	-	-	-	-	-	-	-	+	-	-	-
33	*Agni mandya*	-	-	-	-	-	-	-	+	-	-	-
34	*Madatyaya*	-	-	-	-	-	-	-	+	-	-	-
35	*Raktanasha*	-	-	-	-	+	-	-	-	-	-	+

36	*Kaphajaroga*	-	-	+	-	-	+	-	-	-	-	-
37	*Medoroga*	-	-	+	-	-	-	-	-	-	-	-
38	*Vataroga*	+	-	+	-	+	+	+	-	-	-	-
39	*Pitta roga*	+	-	-	-	+	+	+	-	-	-	-
40	*Vata prakriti*	+	-	-	-	-	-	+	-	-	-	-
41	*Pitta prakriti*	+	-	-	-	-	-	+	-	-	-	-
42	*Heenamedha*	-	-	-	-	+	-	-	-	-	-	-
43	*Heenasmriti*	-	-	-	-	+	-	-	-	-	-	-

CHAPTER 3 : RASA DHATU

I) ***DHATU***:

Vyutpatti:

"Dha Sitanigamati Iti Tun Unam

Sarira Dharaka Vastuni |" [114]

The word *'Dhatu'* is derived from the root "*Dha*" which means to support and nourish.

"Dhiyate Sarvam Asmin Iti |" [115]

That which is existing is supported by this entity or because they bear does *deha dharana* and support the body, they are termed as *Dhatu*.

Nirukti:

a) "*Dadayati Sarira Samvardhakan Iti Dhatu |"*[116]

The one which supports the growth of the body is termed as *Dhatu*.

b) "*Ete Sapta Swayam Sthitva Dehan Dadhati Yan Nrnam |"* [117]

Dhatus are stable constituents, the basic elements of the body, which make the body exist.

Overview of *Dhatu*:

The entity that sustains and grows, nourishes the body is called *Dhatu*. *Dhatu* indicates the sustenance of the body and the nourishment of only the *sara* part of *Ahararasa*. Food should be digested by: *Pachakagni*, then *dhatwagni* (along with *bhutagni*). *Dhatu* receives nourishment from other *Dhatu* and nourishes other *Dhatu*.

***Dhatu* criteria**

These are functional tools of the *Dosha*. It is through this medium of *Dhatu* that all the functions of the living body take place. It should be noted that the location of *Dosha, Mala,* etc. exists in other entities of *Dhatu* like *Agni, Bala* takes support from *Dhatu*.

- They are nourished by *sara bhaaga* of food.
- This entity is mainly intended for the sustainability of the living body.
- It is the *dhatu* that gives rise to *upadhatu*.[118]
- It is *dhatu* that gives origin to the *mala*.[119]
- It is *Dhatu* who gives rise to the next *dhatu*.[120]
- Their formation happens in "*srotas*".

- ♣ They are never the main cause of illness.
- ♣ They are seven in number.[121]
- ♣ With the progress of age, the strength of the *dhatus* naturally decreases.
- ♣ They find their origin in intrauterine life.
- ♣ *Dhatu* is "*Nityaga*". It means an entity that never stops short of anything. The structure, and its function continues, the new replace the old and life goes on.
- ♣ *Dhatu* is also "*Anubandha*". This means that the entity that gives rise to the same type to offer the same type of function.
- ♣ *Dhatu* has the quality "*Jivitam*". It means that entity which helps a person to live. Without *Dhatu* it is not possible to live.
- ♣ It is *Dhatu* which supports *Dosha, Mala, and Updhatu*.

***Dhatu poshan prakriya*:**

Dhatu are the main components in the body that are functioning normally. Every component of the body is *dhatu*, including *Tridosha, Sapta dhatu,* and *Trimala*.

In the normal state, every component of the body is called "*Dhatu*". Trividha dosha is the first element which deviates from the normal state for some reason, that is why they are called "Dosha", that is to say; which are the reason for other abnormal conditions.

दोषा एव हि सर्वेषां रोगाणां एककारणम्। [122]

And because of Dosha, other constituents deviate from the normal state, which is why they are called "Dushya", that is to say; the one that gets vitiated.

General mechanism of production of Dhatu in Srotas:[123]

1. Dhatu Replinishment: The whole body is believed to be made up of srotases. The dosha circulating throughout the body can vitiate these srotases. Likewise, drugs also circulate in the body.

2. Maintaining Dhatu homeostasis: in addition to the main function of replenishing Dhatu; The srotas have another very important function in keeping Dhatu in a homeostatic state.[124]

Disturbed and aggravated doshas, which roam in the body freely, cause disease in a place where they are confined due to an obstruction in their natural passage.

Nourishment of Dhatu by three nyayas:

Various acaryas introduced the nyayas into the process of explaining dhatu utpatti and poshana.Three nyayas arose in this context, namely kshira dadhi nyaya, kedari kulya nyaya and khale kapota nyaya

1. Sarvatmana parinama paksha or kshira dadhi Nyaya:[125]

After the digestion of Ahararasa by Dhatwagni, the required nutritional portion of Ahararasa is digested and becomes Dhatu. Since the conversion is total, it is called kshira dadhi nyaya. As the milk becomes curdled in its entirety, the dhatu portion is completely bioconverted.

If the previous dhatu becomes the next dhatu in total, then if a person fasts for a few days, then there cannot be only shukra dhatu as a remainder in the body, so this nyaya alone has not been accepted. Eventually, the first nyaya alone is insufficient.

2. Kedarikulya Nyaya:[126]

Part of Dhatu is converted immediately and part of it takes time. Since the channels through the field soak some plants directly and others after moistening the soil, Ahararasa must transmit few nutrients immediately and few after some time.

This nyaya also indicates that some Dhatu like Rasa can get nourished before Mamsadhatu. It is assumed that Rasadhatu is closer to the canal and mamsadhatu is further away.

Yet there must be a selection of Ahararasa nutrients for a particular Dhatu, so a third nyaya is needed. If the portion of Ahararasa required for dhatu is not fully converted, Dhatu will not be well nurtured. Therefore, the first nyaya is necessary.

3. Khalekapota Nyaya:[127]

This nyaya indicates the nutritive selection of Ahararasa for each Dhatu. No nyaya is complete without it. Based on the above discussion, all three nyayas are important and no nyaya satisfies the bioconversion of nutrients into Dhatu.

Dhatwagni

The seven tissue elements of the body contain their own agni to metabolize the nutrients supplied to them through the circulation channels.

- Rasagni in Rasa dhatu or plasma.
- Raktagni in Rakta dhatu or blood.
- Mamsagni in the Mamsa dhatu or muscle.
- Medagni in the Meda dhatu or fat.
- Asthyagni in Asthi dhatu or bone.
- Majjagni in the Majja dhatu or bone marrow.
- Shukragni in Shukra dhatu or reproductive fluid.

Role of Dhatwagni and Bhutagni in the generation of dhatu

If Rasa Dhatu and Rakta Dhatu are taken into account; they are fluids, both are mobile in nature, both circulate in the body through the heart; however, the panchabhoutika composition of the two varies slightly. Rakta carries Prana[128] (प्राणा: शोणितमनुवर्तन्ते).This indicates that the Apya part of Rasa-Dhatu is different from the Apya part of Rakta-dhatu. The Apya part of Rakta-Dhatu is more Teja than Rasa. The Apya portion of the two dhatus is different in proportion. The Apya part of Rasa-Dhatu is more in proportion of Jala than other mahabhuta. The Apya part of Rakta-Dhatu is more in Jala and Teja than other mahabhutas.

It is the interrelation and conjugation of two mahabhuta paraspara samyoga, namely Jala and Teja. Panchabhoutika agni must control this. Agni of Rakta has

intimate needs of Rakta-dhatu to panchbhoutika agni. It is this sign of Dhatwagni that makes panchabhoutika agni decide what to do. Therefore, it is read that Bhutagni also plays at the level of Dhatu, (व्यापार धातुष्वपि), along with Dhatwagni.

Of these two types of agni, Bhutagni is the one who gives a complete conversion. Dhatwagni, digested in two portions, namely "sara" and "kitta". The same nyaya applies to the digestion of food. Pachaka Pitta digests food in two portions, namely "sara" and "kitta". However, Bhutagni here is concerned with helping in the genesis of the dosha in the avasthapaka. Breaking down the complexity of food is the job of jatharagni. This jatharagni must be supplemented with internal Bhutagni food.

RASA DHATU NIRUKTI- PARYAYA

a. Shabdakalpaduma[129] –

रसः, पुं (रसतीति । रस् + पचाद्यच् । यद्वा रस्यते इति ।

रस आस्वादने + "पुंसि संध्न्याया घः प्रायेगा |"

The product which is available after digestion, the one which helps in relinquishing the taste is known as rasa.

b. Vaidyakshabdasindhu [130]–

शरीरस्यधातुषु प्रथमधातौ । स चाहारसारभूतः ।

आहारस्य रसः सारः । [131]

सम्यक्प्क्वस्य भुक्तस्य सारो निगदितो रसः |

Rasa is considered as the first dhatu amongst all the shareerika dhatus. it is formed as the resultant of the sara bhaga of ahara.

Sharangadhara opines rasa is the essence of ahara which has undergone proper digestion.

c. Amarakosha [132]–

रुपं शब्दो गन्धरसस्पर्शाश्च विषया अमी ।

गोचरा इन्द्रियार्थास्च हृषीकं विषयीन्द्रियम् । हृषीकम् – विषयि (विषयिन्) इन्द्रियम्

Amarakosha says roopa, shabda, gandha rasa and sparsha are considered as the sense objects of the 5 sense organs.

RASA DHATU UTPATTI – PARINATI [133]

According to the kedari kulya nyaaya, the poshana of rasa, it is through the ahara and its further nirmiti of ahara rasa. Part of this ahara rasa, through the rasavaha srotas, nourishes the rasa dhatu. Of this, the remaining ahara rasa, a part gains the rakta varna, gandha, and through the raktavaha srotas, nourishes the rakta dhatu. Likewise, part of the ahara rasa through the mamsavaha srotas nourishes the mamsa dhatu, and so on until shukra dhatu. From shukra dhatu, prasadrupa garbha is formed

Various scholars are of the opinion that by following the kedari kulya nyaya, the ahara rasa through the stroto marga nourishes the dhatus. The contact of ahara rasa with agni and its transformation into rasa dhatu does not take place here. So what happens is ahara rasa, rasa poshak bhaag goes and nourishes rasa dhatu, rakta poshak bhaag goes and nourishes rakta dhatu. After the rakta dhatu gets nourished, the mamsa poshaka bhaga will nourish the mamsa dhatu. Likewise, the medo dhatu poshak bhaag nourishes the medo dhatu. So from this nyaya one should understand that after the rasa poshana there is rakta poshana, after the complete nourishment of rakta there is nourishment of mamsa and so on until shukra.

Through kedari kulya nyaya, when one consumes vrishya dravyas, the ahara rasa formed through it nourishes the shukra dhatu through prabhava. Now when there is rasa dhatu dushti, then its next dhatus, i.e. rakta will also be dushita because the main rasa dhatu is dushita, therefore uttar uttara dhatu will also be dushita. However, by kedari kulya nyaya, that dhatu which is dushita remains confined to that dhatu only, it is not transferred according to the transformation to the dhatus to originate. As in the sthaulya, it is the meda dhatu which is extra supplemented, however the other dhatus are generally observed in the kshaya avastha.

Kedari kulya nyaya is tulya bala with khalekapota nyaya. When the concept of vrishya dravya is explained, in the context of kedari kulya nyaya, the ahara rasa has to go through rasadi dhatus to reach shukra, however in khalekapota nyaya, vrishya karma reaches shukra dhatu through prabhava. In this, when there is rasa dhatu dushti, it will not result in rakta dhatu dushti. Now, regarding kedari kulya nyaya, not all

ahara rasa turns into rasa, so part does, even if there is rasa dushti, then only part of ahara rasa that reaches rasa dhatu will be dushita. Through this nyaya, the previous dhatu is not responsible for the nourishment / growth / vitiation of the latter dhatu as the ahara rasa is distributed equally to each dhatu as needed. Therefore, in the case of sthaulya, although there is meda vridhi, asthi vridhi will not be marked, because it is not responsible for asthi dhatu. Now the acaryas have accepted both views, but they haven't ruled out either. It is not believed that the two are similar in action, therefore the use of one should be omitted; however, both have the same importance in dhatu poshana prakriya.[134]

In the sutrasthan it is mentioned that the rasa dhatu receives its nourishment. Ahara rasa is the nutrient that nourishes the rasa dhatu, this rasa dhatu nourishes the rakta dhatu and thus forms the prasad bhaag of rakta dhatu and so on.

In the grahani chikitsa, it is said that it is from the Prasad bhaaga of the dhatus, that the uttara uttara dhatus are formed. Therefore, it is from the prasada bhaag of rasa dhatu that rakta dhatu is formed and nourished, and it is from the Prasad bhaag of rakta dhatu that mamsa dhatu is formed and nourished, and so on.

Panchbhautikatwa of Rasa Dhatu, Swarupa and Pramana [135]

Rasa is the ultra-fine or subtle form of a food extract or essence. The essence of the food we eat is used to create Rasa Dhatu. Shad Rasas, or six tastes, will be added to the food we eat, including Madhura (sweet), Amla (sour), Lavana (salt), Katu (spicy), Tikta (bitter), and Kashaya (astringent).

We consume food in 4 forms [136]i.e;

Ashita - those items which can be chewed and eaten, Khadita those items which are eaten by biting and then swallowed, Peeta those food items which are drinkables, Leeda- those items which are eaten by licking, - these are the forms of food which are Pancha Bhoutika in nature (made up of components of 5 elements of nature i.e. prithvi, vayu, jala, agni and akasha). The following traits will be added to this food: Shat Rasa comes in six different flavours, while Dwividha Veerya comes in two different potencies: Sheeta Veerya (cold potency) and Ushna Veerya (hot potency) (hot potency). Sheeta (cold potency), Ushna (hot potency), Guru (heavy

potency), laghu (light potency), mrudu (soft potency), teekshna (strong potency), snigdha (oily potency), and ruksha (oily potency) are the eight categories of potency in Ashta vidha veerya (dry). Aneka Guna has a variety of attributes, such as Guru (heavy), Laghu (light), and so on. Food becomes an extract or a micro-fine essence when it is loaded with these properties and undergoes good digestion by Jatharagni (belly fire) (like juice extracted from food). Rasa is the essence of food.

Rasa dhatu pramana [137]

- Nava anjali

The rasa dhatu which is formed in our body is 9 anjali's in quantity.

Types of Rasa Dhatu and Sthana of Rasa Dhatu [138]

Each dhatu has its own agni. It is called dhatwagni. Rasa Dhatwagni is a separate agni for Rasa Dhatu. This agni breaks down the ahara rasa or poshaka rasa into the following components:[139]

Poshak rasa dhatu - A portion of the rasa travels forward to form Rakta dhatu, the following dhatu. Rakta dhatwagni takes this part and process it. Ranjaka Pitta is said to give colour to the rasa that has the property of water. This occurs when the circulating dhatu enters the Yakrit (liver) and Pliha (spleen), which are the roots of the Raktavaha srotas. The liver and spleen contain Ranjaka pitta. When circulating rasa is exposed to ranjaka pitta and enters certain organs, it turns red in colour.

Sthayee rasa dhatu –

24 dhamanis are arising from Hridaya. Which includes 10 up, 10 down and 4 on the sides. In addition, they divide into thousands of small branches and supply all the cells in the body. These branches of dhamnis appear in the form of a large network. Their terminal endings open at the roots of hair follicles (skin pores - romakupa), through which they excrete waste products in the form of sweat. These branches carry Rasa through its small branches and nourish every corner of the body. The terminal branches of the dhamanees located near the surface of the skin or near the roots of the hair follicles absorb the veerya (active ingredients) of drugs when performing treatments such as Abhyanga (herbal oil massage), Parisheka (stream of

medicinal liquids such as oils, ghee, milk, etc.), avagaha (tub bath in medicinal liquids), Lepa (herbal pastes), etc. are made or applied to the skin. The active ingredients of the drugs are digested and processed by Bhrajaka Pitta (subtype of pitta located in the skin) located in the skin, into a form beneficial to the body and they are transported to Rasa dhatu through its terminal openings of dhamanees on the skin. So, dhamanees also help nourish the Rasa Dhatu through the skin. These dhamanes also transmit the pleasure and pain signals felt by touch (skin) to the Atma (soul), that is, dhamanees make us feel many beneficial and non-beneficial sensations.

Small pore-like apertures will appear on the lotus flower and stem. The materials leave the lotus and enter the water through these pores, while nutrients and water enter the stem and lotus through these pores. The terminal branches of the dhamanees have similar openings. The Rasa dhatu will emerge from the dhamanees through these pores to replenish the body's tissues and pores. "Sthayee Rasa Dhatu" is the rasa dhatu that seeps from the dhamanees' terminal branches.

The Rasa dhatu component is termed "Dhatu Rasa" because it nurtures the Rasa dhatu. Because the form of both Rasa is similar (same), the function and flow in identical channels can be considered as the same. Poshaka Rasa is so named because nutrients (poshaka amsha) are only present in Ahara Rasa (essence of food digestion). It is known as Sthayee Rasa because it is a stable element that is found in the body's composition together with other tissues (e.g., rakta, mamsa, asthi, etc). (stable rasa). In due course of time, Poshaka rasa will naturally convert into Sthayee rasa. The tissues Poshaka Rasa and Sthayee Rasa are one and the same.

Rasa Samvahana[140] –

Rasa dhatu, like sound waves, fire flames, and water flow, circulates in a micro-fine manner throughout the body without interruption. The rasa dhatu pushes the section of the rasa dhatu in front of it into the channels and takes its place, much similarly as one sound wave pushes the other sound wave and takes its place. This forward push of the succeeding portion of the rasa dhatu into the channels by the part of the rasa dhatu that preceeds it, causes the rasa dhatu to flow.

The concept of a pressure gradient is as follows. When the provided rasa dhatu is used up by the tissues or portions of the body, it is replaced by the circulating rasa

dhatu. The rasa dhatu oozes from its terminal ends dhamanees into the tissues to nourish them, just as water seeps or flows into its surroundings due to pressure.[141]

By consuming the above mentioned bhojya padartha on a regular basis, repeatedly, the cycle of shukra nirmitti keeps on moving, and stays continuous.

Faeces and urine are the waste products of food; its essence is Rasa, this is purveyed by vyana vata all over the body and nourishes all the dhatus.

तत्र 'रस' गतौ धातुः अहरहर्गच्छतीत्यतो रसः । [142]

Circulation is main function of Vyana. It circulates in entire body at a time. This act of circulation is ceaseless and is done all the time.

Rasa Dhatu Pramana

Charaka Samhita: –

Rasadhatu formed from the digested food measures about 9 anjalis.[143] (3 anjali = 1 litre), (measures of something which fills in one's own hollowed out hands/palms is equal to 1 anjali. This is said to be the maximum quantity of Ras dhatu in the body. The quantity can increases even in normal individuals. Any tissue is said to be present in normal quantity (in a given person) when its functions are seen to be normal and in the presence of normal physical and mental health along with a feel of pleasure and happiness, a feeling of well being deep in the soul. This rule is applicable to Rasa dhatu also.

Day to day metabolism does not allow stating measure of any particular physiological body entity. Measure of each entity changes as it depends on eating and other activities by individual everyday. This is perfect postulation of Sushruta Samhita.

RASA DHATU KARMA

रसस्तुष्टिं प्रीणनं रक्तपुष्टिं च करोति । [144]

Rasa dhatu provides satisfaction, nutrition and supplies nourishment to rakta dhatu [145]

Rasa which is the (This) essence of food will not be able to satisfy aged person by nourishing, since their tissues are over matured by senility

स खलु द्रवानुसारी स्नेहनजीवनतर्पणधारणादिभिः विशेषैः सौम्य इति अवगम्यते । [146]

On this 'Rasa' which is moving in the entire body its different parts, organs, dosas, dhatus, mala and viscera, there is a debate; Is this soumya (cold in properties and actions) or taijasa (hot in properties and action) ? On this we say, since it is a liquid possessing properties such as unctuousness, envlivening (sustaining life), nourishes, supporting etc., it should be considered as soumya (cold in properties and actions) only.

यथा स्वभावतः खानि मृणालेषु बिसेषु च । धमनीनां तथा खानि रसो यैरुपचीयते ॥ [147]

Just as by nature, vacant spaces are present in the flower stalk and tuber of the lotus plant, similarly, vacant spaces are present in the dhamani also, through which the rasa (nutrient tissue) gets increased during spreading to the entire body.

तत्र गर्भस्य.... श्शरीरोपचयो बलं वर्णः स्थितिर्हानिश्च रसजानि । [148]

Growth of the body, strength, colour of the body, existence of the body in normalcy and its destruction are derivations from rasa dhatu.

रसजं पुरुषं विद्याद्रसं रक्षेत् प्रयत्नतः । अन्नात्पाानाश्च मतिमानाचाराच्चाप्यतन्द्रितः ॥ [149]

We are all made up of the essence of food that has been digested. Our health is determined by how well it is created, how well it circulates throughout the body, and how well it nourishes other tissues. Only by providing our stomach with good food in terms of quality, quantity, and time we can achieve the best quality and amount of rasa. That will be taken care of by judicious and conscious eating.[150] If the rasa is not adequately formed or is contaminated, it might cause a variety of systemic disorders. Obesity and emaciation are also influenced by the quality and quantity of rasa dhatu, as well as its distribution, conversion, and utilisation in the body by body components.

- Rasa dhatu works from intrauterine life. The growth, nutrition, strength and entire life of the fetus depend on Rasadhatu.
- Rasa dhatu works primarily to refresh the individual.
- Rasa dhatu satisfies the metabolic urges of an individual.

- Even though Rasa dhatu is believed to produce nutrition for all entities of the body and is responsible for the growth of the body, this fact holds true for growing children. For adults, it satisfies the body. In old age, it does not do its function well. It just carries on life in old age.

- Rasa dhatu is responsible for the nutritional status of the living body whether a person is thin or obese. This condition only applies to adulthood. In old age, it does not perform its function adequately, but it supports the life of the elderly.

- As this Rasadhatu is fluid and works for the smoothness of the body, for the maintenance of life, for refreshing the bodily entities and for the homeostatic state of the body, it is logically deduced that it is soumya.

- Rasadhatu works for the nutrition of all areas of the living body. It is compared to the stem of the lotus flower, which provides nutrients to the lotus.

- Rasadhatu in the form of an excellent part of dhatu nourishes the body, which is called "Oja".

- Rasadhatu brings Ahararasa to all bodily entities and keeps them fresh. Hence, it is essential to save Rasadhatu in the body and keep it in a physiological state.

- Rasa dhatu performs the afore mentioned functions not just with respect to tissues, but also with respect to body parts, doshas, upadhatus (sub-tissues), and malas (excreta).These Rasa dhatu functions are mandatory for bodily functions to continue to function smoothly.

- As a result, proper Rasa dhatu circulation keeps all physical and mental functions (activities) in a regular rhythm. Rasa is also known as "ojus" or "essence of life" because it is in charge of all bodily functions.

Rasadhatu Sara

Twaka Sara Lakshana [151]–

The skin and the Rasa dhatu have a proximal relation. This rasa dhatu's richness (in terms of quality and quantity) or inadequacy of rasa dhatu is mirrored on the skin. The symptoms of a high-quality rasa dhatu in the body are as follows:

- Snigdha – oiliness or unctuousness at the base of hair follicles (skin surface)
- Slakshna – smoothness and softness of body hairs and skin
- Mrudu – soft skin
- Prasanna twak – pleasant and attractive skin
- Saprabhava – good lustre and complexion of skin
- Alpa (not thickly distributed)
- Gambheera roma - hair follicles with deep roots
- Sukumara - delicate and soft skin and follicles
- Twak Sarata, or Skin with Enriched Qualities, signifies -
- Sukha – comfort and happiness
- Saubhagya - prosperity
- Aishwarya – fortune, wealth
- Upbhoga - luxury
- Buddhi - Intelligence
- Vidya - knowledge
- Arogya - good health
- Praharshan – exhilaration, natural tendancy to be happy
- Aayushyatwa - longetivity of life

Rasa is a form of water. It keeps skin fresh as first exhibition of water content of body is always on skin. Skin looks fresh, hairs on skin are soft in sara individual. Skin is unctuous, smooth, with soft, fresh, thin, deeprooted hairs. Such people always get happiness, luck, wealthy, they are intelligent, healthy, long lasting ones.

RASA DHATU VRIDDHI-KSHYA-VIKARA

Ras Dhatu Vriddhi Lakshan –

Great increase of Rasa dhatu produces oppression in the heart (nausea), increased salivation etc.

रसोऽपि श्लेष्मवत [152]

Rasa vriddhi (pathological increase in rasa dhatu amount) has symptoms that are comparable to kapha vriddhi. They are as stated below –

1. Agnimandya – slow digestion
2. Praseka - excessive salivation
3. Aalasya – a lack of motivation to work (inspite of intact physical strength)
4. Chardi - vomiting
5. Shweta varna (pallor)
6. Gaurava - feeling of heaviness
7. Shwaitya – whitish discolouration of body
8. Shaitya – unnatural coolness in the body
9. Anga shaithilya – sensation of looseness or lack of integrity of body parts
10. Shwasa – dyspnoea, difficulty to breath
11. Kasa - cough
12. Atinidra – excessive sleep

Rasa Dhatu Kshaya Lakshana [153] -

When there is a lack of rasa, the body's regular activities, including nutrition, get impeded. As a result, the body receives inadequate nutrients.mukha shosha – dryness of mouth

sharira shosha – dryness of body parts
karshya – emaciation
trishna – thirst
Shunyata refers to a feeling of emptiness in the stomach, heart, and mind. shabda asahishnuta intolerance to sound (phonophobia)

shrama – fatigue hridaya ghattana - heartache with the sensation of someone clutching and violently shaking the hearthrit kampa – an increase in the number of heartbeats (tachycardia)

hrit drava – palpitation
hrit shula – cardiac pain (coronary thrombosis)
shrama – klama –exhaustion even after accomplishing a tiny amount of effort.

Vata vitiation occurs when dhatu kshaya (tissue depletion) occurs. This rule also applies to the deficiency of rasa dhatu. All of the above symptoms are caused by vata vitiation as a result of rasa kshaya.

घट्टते सहते शब्दं नोच्चैर्द्रवति शूल्यते । हृदयं ताम्यति स्वल्पचेष्टस्यापि रसक्षये ॥ [154]

On depletion of rasa dhatu, even on minor exercise or physical work, there is a sensation of a pressing pain over the cardiac region. It is almost impossible to hear high pitched sounds. Frequent and easy palpitations over the cardiac region. Pricking sensation over the cardiac region and blurring of vision

रसे रौक्ष्यं श्रमः शोषो ग्लानिः शब्दाऽसहिष्णुता । [155]

Twaka rookshta (dryness of skin)

- Shrama (exhaustion)
- Shosha (dehydration)
- Glani (malaise)
- Shabdasahishnuta (phonophobia)

Rasapradoshaja Vyadhi [156]
Ashraddha (disintrestedness)
Aruchi (anorexia)
Asya vairasya
Arasagnatha (inability to recognise the taste)
Hrillas (acid brash)
Gaurava (heavinss)
Pandutva (pallor)

Srotorodha

Jwara

Angamarda (lassitude)

Napumsaktwa (Impotancae)

Saada (extreme weakness)

Krushtwa (emaciation)

Agnimandya

Akalpalitwa (premature onset of old age symptoms)

RASA DHATU CHIKITSA [157]

Rasapradoshaja Vyadhi Chikitsa – In the management of vitiation of Rasavaha srotas and the disorders of their origin, all types of Langhana should be followed. Langhana means lightening therapies (which produce lightness in the body). Langhana is of 10 types –

- Vamana - therapeutic emesis
- Virechana – therapeutic purgation
- Shirovirechana (nasya) – nasal medications
- Niruha basti – evacuation or cleansing enemas
- Pipaasa – not driniking water
- Maruta – exposure to breeze
- Aatapa – exposure to sunlight
- Pachana – medicines or treatments which can digest and destroy ama (metabolic wastes)
- Upavasa – starvation
- Vyaayaama - exercise

RASAVAHA SROTAS

ध्मानात् धमन्यः स्रवणात् स्रोतांसि सरणात्सिराः । यत् विविक्तं यदुच्यते महान्ति चाणूनि स्रोतांसि तदान्तरीक्षं । [158]

Rasavaha srotas Mulasthana:

रसवहानां स्रोतसां हृदयं मूलं दश च धमन्यः । [159]

According to Charaka, the origin of the Rasavaha srotas can be found in

- ♣ Hriday – the heart, and
- ♣ Dasha Dhamanis – the ten larger arteries that originate in the heart and divide into small branches as they travel throughout the body.

RASA VAHA SROTAS DUSHTI HETU

Charak Samhita – Since Rasa increases and vitiates due to eating heavy, cool, unctuous food in large quantities, Rasadhatu must be bearing all these qualities. Mental pressure also seems to disturb normal Rasadhatu.

Rasavaha sroto-dushti karana: [160]

- Guru aahara – heavy foods
- Sheeta aahara – cold foods
- Ati snigdha – excessive consumption of oily foods
- Ati maatram – overeating
- Ati chintanaat – overthinking (stress)

Rasavaha Sroto-dushti chikitsa:

Srotas Vyakhya:

मूलात खादन्तरं देहे प्रसृतं त्वभिवाहि यत् । स्रोतस्तदिति विज्ञेयं सिराधमनीवर्जितम् ॥ [161]

Srotas Mulasthana:

रसवहे द्वे, तयोर्मूलं हृदयं रसवाहिन्यश्च धमन्यः, तत्र विद्धस्य शोषः प्राणवहविद्धवच्च मरणं तल्लिंङ्गानि च ॥ [162]

According to Sushruta –

Rasavaha, there are two srotas or channels that convey the nutritive essence to every region of the body. They have their origins in –

Hridaya – the heart and

Rasa vahini dhamnees – the arteries that transport rasa to all parts of the body.

Symptoms of Rasavaha srotas damage or injury include:

• Shosha – emaciation

• Pranvaha srotas viddha lakshana – symptoms similar to those seen with pranvaha srotas injury

• Maranam – death

RASA DHATU – A MODERN PERSPECTIVE

Rasa dhatu is principally responsible for preenana, or the transportation and supply of nutrition and food to all of the body's cells. The blood is responsible for this function. Rakta dhatu, or blood tissue, is the second tissue in the chronological order of tissues, according to Ayurveda. Blood is made up of two parts: a liquid component called plasma or lymph and a cellular component that includes red blood cells, white blood cells, platelets, and other components. The liquid component of blood is known as Rasa dhatu, whereas the cellular component is known as Rakta dhatu.

There are two ways to look at the body's total water content:[163]

• Intracellular fluids (fluid that exists within cells)
• Extracellular fluid (fluid present outside the cells)

Transcellular fluid, such as cerebrospinal fluid (CSF), peritoneal fluid (present between the layers of membranes covering the abdominal viscera), pleural fluid (present between the layers of membranes covering the lungs), etc., can be observed as the distribution of extracellular fluid in the body.

The fluids that surround and bathe the cells of the tissue are known as interstitial or tissue fluids. Intravascular fluid is the fluid of connective tissue.

The liquid that's inside the blood vessels are two types -

• Plasma

• Lymph

Plasma [164]-

After red blood cells, white blood cells, platelets, and other components have been removed, this is the clear, straw-colored liquid part of the blood that remains. It makes up roughly 55 percent of human blood and contains water, salts, enzymes, antibodies, and other proteins, among other things. Plasma usually has complete blood cells suspended in it. The extracellular matrix of red blood cells is made up of it. The human body also uses plasma as a protein reserve. It is essential for the intravascular

osmotic action, which maintains electrolyte balance and protects the body from infections and other blood disorders.

Plasma functions -

Nutritional transport -

Transporting nutrients throughout the body is one of plasma's most vital roles. Food is broken down into its constituents as it is digested in the stomach and intestines. Amino acids, lipids, carbohydrates, and fatty acids are all examples of this. These nutrients are sent to cells all across the body, where they are used to keep cells healthy and functioning.

Transport of wastes: Plasma also carries wastes such as uric acid, ammonium salts, creatinine, etc. from cells to the kidneys. The kidneys filter this waste from the plasma and excrete it in the urine.

Maintains blood volume:

Protein, primarily albumin, makes up around 7% of plasma (a protein important for tissue growth and repair). This concentration is required to keep the blood's osmotic pressure constant. Albumin can also be found in the fluids surrounding cells (interstitial fluid). This liquid has a lower concentration of albumin than plasma. As a result water cannot move from the interstitial fluid into the bloodstream. Water would enter into the circulation, causing the blood volume to rise incase of absence of plasma albumin. Blood pressure would rise as a result of this. It would also place a significant strain on the heart by increasing the workload.

Balance electrolytes -

Electrolytes are salts found in plasma. Sodium, calcium, potassium, magnesium, chloride, and bicarbonate are among them. Electrolytes are necessary for a variety of bodily functions. Electrolytes perform a variety of critical tasks, including muscular contraction, nerve impulse transmission, and signal transmission.

Provides defense or immunity to the body.

Immunoglobulins are another type of protein found in plasma (antibodies). They defend the body against foreign substances such as bacteria.

Fibrogen is a protein that aids platelets in the formation of blood clots. Plasma plays an important part in the body's defence mechanism against infections and blood loss by carrying these proteins.

Lymph [165] -

All of the components of plasma are more or less the same in lymph, it is merely another kind of plasma that has come out of the blood vessels. Lymphocytes and other white blood cells are found in it. It also contains bacteria and proteins, as well as cellular waste and debris. The lymphatic system is a collection of tissues and organs that aid in the removal of toxins, wastes, and other undesired substances from the body.

The lymphatic system's primary job is to transfer lymph. Lymphatic vessels, which are analogous to veins and capillaries in the circulatory system, make up the majority of the lymphatic system. The lymph nodes, where the lymph is filtered, are attached to the lymph vessels. The lymphatic system includes the tonsils, adenoids, spleen, and thymus. The lymphatic system is made up of plasma components that do not enter the venous system. In the form of lymphatic capillaries, this system begins in the subcutaneous tissue, muscle spaces, abdominal and thoracic organs. Lacteals are lymphatic capillaries in the intestinal villi that transport absorbed fat. The left thoracic duct connects these lacteals. The lower limbs, abdominal viscera, and the left upper limb are all drained by the left thoracic duct. The right lymphatic duct drains the right thorax and right upper limb. The contents of the right and left thoracic ducts drain into the right atrium, where they join the right lymphatic duct and the left subclavian vein, respectively. Interstitial pressure, arterial pulsation, and intrathoracic pressure all affect lymphatic flow.

Lymph nodes -

The lymph flows via filter units in lymph nodes as it travels through the body. They're mainly located in the groin (inguinal lymph nodes), armpits (axillary lymph nodes), neck (cervical lymph nodes), abdomen (abdominal lymph nodes), lungs'

hilum (hilar lymph nodes), and other places. A lymph gland has a spherical body. The outer cortex and the inner medulla make up the 2 parts of the lymph node. The hilum refers to the gland's core.

As an afferent lymphatic capillary, lymph vessels enter the gland through the cortex. Then it spreads through the gland's lymphatic sinuses. These sinuses' reticulo endothelial cells engulf and eliminate the toxic substances caught by the lymphatics, purifying the lymph. The purified lymph exits the lymph node through the hilum.

The inguinal lymph nodes enlarge within 2-3 days after a thorn prick or injury to the leg, indicating that the lymph nodes have filtered the poisonous compounds from the leg and are thus inflamed. Lymphatics drain metabolites and are found throughout the subcutaneous tissue beneath the skin, close to blood capillaries.

Lymphatic functions –

- Removes interstitial fluid from tissues;
- Absorbs and transports fatty acids and fats from the digestive system in the form of chyle; transfers white blood cells to lymph nodes and lymph nodes to bones.
- Delivers antigen-presenting cells, such as dendritic cells, to lymph nodes, where they promote an immune response.
- Because blood plasma is a vital component of the blood that is released into circulation by the heart (rasa vaha srotas), it can be linked to "rasa dhatu" because of their comparable appearance, function, and circulation.

Capillary filtration eliminates plasma and leaves blood cells in the human circulatory system, which processes an average of 20 litres of blood every day. Around 17 litres of filtered plasma is reabsorbed straight into blood vessels, leaving 3 litres in the interstitial fluid.

The lymphatic system's main function is to provide an additional return pathway to the blood for the remaining 3 liters. Thus, the lymphatic system is also an important part of the circulatory system, and can therefore be included in the rasa dhatu.

Lymph does likewise work as Sthayee Rasa Dhatu (poshak rasa dhatu or circulating rasa dhatu) like sifting out toxins etc. so plasma and lymph can be correlated as rasa datu.

CHAPTER 4 : Lipid Profile

The lipid profile includes analysis of total cholesterol, triglycerides, HDL, LDL and VLDL. All of these tests will be performed with the serum taken from the coagulated blood. Therefore, we need to know all these components directly from the serum.

SERUM

Blood is made up of plasma and cells (red blood cells, white blood cells and platelets). It is mainly a means of transporting oxygen, nutrients, hormones and anti-infective agents, for example, antibodies to tissues and for the removal of carbon dioxide and other wastes from the tissues and their removal from the body. The ubiquitous distribution of blood throughout the body and its unique chemical characteristics make it a more efficient transport system.

Plasma is the liquid component of blood in which the formed elements are freely suspended. Serum refers to blood plasma from which clotting factors (such as fibrin) have been removed .[166]

The word serum is derived from the word "Sera", which means clear liquid. [167]

The serum is clear with a slight straw color and looks like whey in appearance. It is made up of water, inorganic electrolytes and blood proteins. It carries gases such as carbon dioxide and oxygen, nutrients such as glucose, lipids, amino acids, hormones, and metabolic end products. [The oxygen carrying capacity and oxygen content of plasma / serum is much lower than that of hemoglobin]. The serum remains in the vessels due to the protein content which maintains the oncotic pressure. [168]

The word serum is used in various places as follows.

1. Serum obtained from the tissues of immunized animals, which contains antibodies is used to transfer immunity to another individual.
2. Any serous fluid, especially the fluid that moistens the surfaces of the serous membrane.
3. Aqueous liquid from animal tissues, such as that found in edema.
4. Whey: the watery material of the curd that has coagulated.

5. The clear yellowish fluid that is obtained when whole blood separates into its solid and liquid components after it has been allowed to clot, also called serum.

Plasma vs serum

Blood contains plasma and formed elements. If the blood is taken from an individual and its clotting is prevented by adding anticoagulants and then sufficiently centrifuged, the blood is separated into two layers, called plasma and a lower layer, where the formed elements are packed.

On the other hand, if the blood is collected and stored without the addition of anticoagulant and when the whole blood coagulates and the clot retracts, a straw-colored liquid separates from the clot which can be further centrifuged and the transparent supernatant part is called serum. The composition of serum is almost (but not entirely) the same as that of plasma, whereas

• Plasma contains fibrinogen and other procoagulant factors, unlike serum (as they have been used to form clots).

• Chemicals have different concentrations in plasma and serum.

The Serum Contents [169]

Albumin, Alpha-1 antitrypsin, Alpha-fetoprotein (adult), Aspartate Aminotransferases (AST, SGOT) Alanine Aminotransferases (ALT, SGPT), Amylase, Angiotensin-converting enzyme (ACE), Bicarbonate (HCO_3^-), Bilirubin (Total, Direct, Indirect), Calcium, ionized Calcium, Chloride, Cholesterol, Complement C, Complement C_4,Creatine kinase, Creatine kinase-MB, Creatinine, Erythropoietin, Ferritin, Gastrin, Glucose, Iron, Lactate dehydrogenase, Lactate dehydrogenase isoenzymes (Fractions 1,2,3,4,5), Lipase, Lipoprotein (a), Magnesium, Myoglobin, Acid Phosphatase, Alkaline Phosphatase, Phosphorus, Inorganic Potassium, Prostate-specific antigen (PSA), Total Protein, Protein fractions- Albumin, Globulin ($Alpha_1$, $Alpha_2$, Beta, Gamma),Insulin, Insulin-like growth factor, Parathyroid hormone, Sodium, Transferrin, Triglycerides, Troponin I, Troponin T, Urea nitrogen, Uric acid, Urobilinogen, Carotenoids, Ceruloplasmin, Copper, Folic

acid, Lead, Vitamin A, Vitamin B_1 (thiamine), Vitamin B_2 (riboflavin), Vitamin B_{12}, Vitamin C (ascorbic acid), 1,25-dihydroxy Vitamin D_3, Vitamin E, Zinc are some of the important serum contents.

Among these, the following items have been selected for this research work based on their merits and the feasibility of conducting research work on them. The essential literal abstract on them are

LIPIDS

Lipids are a heterogeneous group of compounds, consisting primarily of carbon (C), hydrogen (H), and oxygen (O). Lipids contains fewer oxygen molecules than carbohydrates. This small amount of oxygen molecules makes lipids insoluble in water, but soluble in non-polar organic solvents such as benzene, chloroform, ether, acetone, alcohol, gasoline, etc. They are of great importance to the body as the main concentrated forms of energy storage, in addition to its role in cell structure and various other biochemical functions.[170]

Classification of lipids [171]

There is no standard classification of lipids. Generally, the well accepted classification is as follows

I. Simple lipids

Esters of fatty acids with glycerol or higher alcohols.

For example. TAG, Waxes.

II. Compound lipids

They are simple lipids with a few additional groups.

- Phospholipids
- Non-phosphorylated lipids

III. Derived lipids

These are lipids derived from lipids or their precursors.

For example. Fatty acids, cholesterol, steroids, prostaglandins, etc.

IV. Lipids complexed with other compounds.

For example. Lipoproteins

Functions of lipids[172]

- Important functions of lipids are mentioned below.
- Energy storage (in the form of triglycerides)
- Structural components of biomembranes (phospholipids and cholesterol)
- Provides shape and contour to the body
- Provides insulation against changes in the external environment (Subcutaneous fat)
- Protects internal organs by providing a cushioning effect (pads of fat)
- Metabolic regulators (steroid hormones and prostaglandins)
- They act as surfactants, detergents and emulsifying agents (amphipathic lipids)
- They act as electrical insulators in neurons
- Helps in the absorption of fat-soluble vitamins (A, D, E and K)
- Adds flavor and palatability to foods.

Fat storage[173]

The main function of adipose tissue is to remove triglycerides from chylomicron and VLDL and store them until they are needed for the production of ATP in other parts of the body. Triglycerides stored in fatty tissue make up 98 percent of all the body's energy stores. They are more easily stored than glycogen because triglycerides are hydrophobic and do not exert osmotic pressure on cell membranes. Fat tissue also insulates and protects various parts of the body. The adipocytes in the subcutaneous layer contain about 50% of the stored triglycerides. The other fatty tissues make up about 12% around the kidneys, 10-15% in the omentum, 15% in the genital areas, 5-8% between the muscles and 5% behind the eyes, in the sulci of the heart and attached to the outside wall of the large intestine. Triglycerides in adipose tissue are continually broken down and resynthesized.

Body lipids

Fat is the second major group of organic compounds in our body (carbohydrates are the first). They represent 18 to 25% of the lean body mass of an adult. They are hydrophobic and only the smallest lipids can dissolve in aqueous plasma. To become more soluble in blood plasma, other lipid molecules complex with hydrophilic protein molecules called lipoproteins. Important lipids in our body include:

1. Fatty acids
2. Triglycerides
3. Phospholipids
4. Steroids
5. Eicosanoids and
6. Other lipids[174]

I. Fatty acids

These are derived lipids and are the most common component of lipids in our body. In nature, free fatty acids are only present in very small amounts. They are usually found in ester linkages or amide linkages in different classes of lipids. In the human body, free fatty acids are formed only during metabolism.

A fatty acid is made up of a long carbon skeleton of 16 or 18 carbon atoms, although some are even longer. Carbonyl group, which is a carbon atom with a double bond to an oxygen atom and a single bond to oxygen bonded to hydrogen (OH-C = O), is the acid group of fatty acids. The acidic property is determined by the ability of hydrogen to dissociate or separate from the oxygen atom. A long chain of attached carbon atoms follows the carbonyl group, known as the hydrocarbon "tail". The long hydrocarbon tail gives fatty acids their hydrophobic or "water resistant" property. Fats cannot dissolve in water because fats are non-polar (an equal distribution of electrons) and water is polar (an uneven distribution of electrons). The polarity of water is unable to bind and break the nonpolar fatty acid molecule.

Types of fatty acids[175]

- **Saturated fatty acids**

Saturated fatty acids have single bonds between the carbon atoms that make up the tail. This lipid is solid at room temperature. Carbon atoms are "full" or saturated and therefore cannot absorb more hydrogen, eg palmitic acid and stearic acid. Foods high in saturated fatty acids include most animal fats, such as butter, milk, cheese, egg yolks, fatty meats (eg, beef, lamb, and pork), coconut oil, chocolate, etc. Saturated fatty acids are the most important factor that can increase a person's cholesterol level.

- **Unsaturated fatty acids**

Unsaturated fatty acids have one or more double bonds between the carbon atoms that form the tail. A double bond is the sharing of four electrons between atoms, while a single bond is the sharing of two electrons. The double bond has the ability to lend its two extra electrons to another atom, thus forming another bond. It is of two types as mentioned below.

1) Monounsaturated fatty acids

2) Polyunsaturated fatty acids.

1) **Monounsaturated fatty acids**

It contains only one double bond, such that each of the carbon atoms of the double bond can bond with a hydrogen atom. An example of monounsaturated fatty acids is oleic acid, which is found in olive oil.

2) **Polyunsaturated fatty acids**

It contains two or more double bonds between the carbon atoms of the fatty acid. Most vegetable fats are polyunsaturated fatty acids. Double bonds change the structure of the fatty acid, so there is a slight bend where the double bond meets. Foods high in polyunsaturated fatty acids include vegetable oils (eg, safflower, corn, cottonseed, soybeans, sesame, sunflower), salad dressings made from vegetable oils, and fish such as salmon, tuna, and herring.

The human body contains a specific pattern of fatty acid composition (but they are included in triglycerides or other lipids). It is as follows: [176]

- 50% - Oleic acid (18 carbon atoms, monounsaturated)
- 25% - Palmitic acid (16 carbon atoms, saturated)
- 10% - Linoleic acid (18 carbon atoms, polyunsaturated)
- 05% - Stearic acid (16 carbon atoms, saturated)

❖ **Essential fatty acids[177]**

Essential fatty acids (EFAs) are those that are necessary for health, but cannot be synthesized by the body. Therefore, it is important to provide the body with essential fatty acids through daily food intake. These are important ingredients for the growth and maintenance of cells. The body uses essential fatty acids for the production of hormones, especially for the production of prostaglandins, which help reduce high blood pressure, migraines, and prevent arthritis and inflammation. Essential fatty acids also have a positive effect on the body, including lowering cholesterol and triglyceride levels, reducing the risk of blood clotting, protecting the body from cardiovascular disease, candidiasis, eczema and psoriasis. They play a fundamental role in the development of the brain.

There are basically two types of essential fatty acids. These are

★ Omega-3 fatty acids
★ Omega-6 fatty acids

★ **Omega-3 fatty acids**

They are also known as linolenic acids. Omega-3 essential fatty acids are found in deep-sea fish, fish oil like salmon, mackerel, anchovies, sardines, and herring; certain vegetable oils such as canola, flax and walnut oil; Nuts such as hazelnuts, almonds, cashews and walnuts; Flax seeds are also a good source, they are low in saturated fat and calories and have no cholesterol. Omega-3 fatty acids help lower triglyceride levels in the body, thereby reducing the risk of heart disease.

★ **Omega-6 fatty acids**

They are also called linoleic acids. Omega-6 fatty acids are found in raw nuts, seeds, legumes, and unsaturated vegetable oils, such as borage oil, grape seed oil, evening primrose oil, oil sesame and soybean oil. Omega-6 fatty acids have been shown to be beneficial in lowering cholesterol levels when they replace saturated fat in a person's diet, thereby reducing the incidence of coronary artery disease, arteriosclerosis in any arteries etc.

★ **Omega-9 fatty acids** [178]

This is a family of unsaturated fatty acids which have in common a final carbon-carbon double bond at ω-9 position; that is, the ninth bond from the end of the fatty acid. Some ω-9s are common components of animal fats and vegetable oils.

II. Triglycerides (Tri acyl glycerol)

The basic structure of lipids is a glycerol molecule made up of three carbons, each attached to a chain of fatty acids. Triglycerides are the body's main form of energy storage. They are also the main form of fat in food. It is the main component of adipose cells / tissues. It provides comparatively more energy than carbohydrates and proteins. Excess fat, protein, and carbohydrates from food are stored in adipose tissue as triglycerides. Since triglycerides are non-polar and hydrophobic in nature, they are stored in pure form without any association with water. Triglycerides are used in the body primarily to provide energy for various metabolic processes.

III. Phospholipids

They contain a phosphate group in their structure (i.e. glycerol + 2 fatty acids + phosphate). It is an amphipathic lipid (i.e. it has polar and nonpolar ends). Important phospholipids are lecithins, cephalins and sphingomyelins. Their functions are: [179]

1. It is the main component of the cell membrane.
2. They are also an essential structure of lipoproteins and therefore help transport cholesterol.

3. Thromboplastin, necessary to initiate the coagulation process, is mainly composed of one of the cephalins.

4. There are large amounts of sphingomyelin in the nervous system; This substance acts as an insulator in the myelin sheath around nerve fibers.

5. They are donors of phosphate radicals when they are necessary for different chemical reactions in the tissues.

IV. Steroids [180]

They have a cyclopentanoperhydrophenanthrene ring (4 carbon atom rings).

Cells in the body make steroids from cholesterol.

This group includes:

a) Cholesterol is a tiny component of all animal cell membranes and serves as a precursor to bile salts, vitamin D, and steroid hormones.

b) Bile salts: they are required for fat digestion and absorption in the diet.

c) Vitamin D: it aids in the regulation of calcium levels in the body and is required for bone growth and repair.

d) Hormones produced by the adrenal cortex: these hormones aid in the regulation of metabolism, stress resistance, and salt and water balance.

e) Sex hormones: promote sexual characteristics and reproductive activities.

V. Eicosanoids [181]

These are lipids derived from a 20-carbon fatty acid called arachidonic acid. The two main subclasses of eicosanoids are prostaglandins and leukotrienes. Prostaglandins have a wide variety of functions. They alter the responses to hormones, contribute to the inflammatory response, prevent stomach ulcers, dilate the airways to the lungs, regulate body temperature and influence the formation of blood clots, etc. Leukotrienes are involved in allergic and inflammatory responses.

VI. Other lipids [182]

This group includes

i. Carotenes: orange-yellow pigments in egg yolks, carrots and tomatoes necessary for the synthesis of vitamin A, which is used to produce visual pigments in the eyes. They also act as antioxidants.

ii. Vitamin E: promotes wound healing, prevents tissue scarring, contributes to the normal structure and function of the nervous system, and acts as an antioxidant.

iii. Vitamin K: necessary for the synthesis of blood coagulation proteins.

iv. Lipoproteins: Carry lipids in the blood, carry triglycerides and cholesterol to tissues, and remove excess cholesterol from the blood.

Lipid digestion [183, 184]

The digestion of lipids takes place in the GIT. The enzymes involved in the digestion of lipids are mentioned below.

- ★ Lingual lipase (acts in acidic pH)
- ★ Gastric lipase (works at acidic pH)
- ★ Pancreatic lipase (works at alkaline pH)
- ★ Cholesterol Esterase (acts in alkaline pH and secreted by the pancreas)
- ★ Phospholipase A2 (acts at alkaline pH and secreted by the pancreas)

About 30% of triglyceride digestion occurs in the stomach and the rest of fat digestion occurs in the small intestine. The main end products of lipid digestion are: -
2 monoacylglycerides, 1 monoacylglyceride, glycerol, fatty acids, cholesterol, and lysophospholipids.

Lipid absorption [185, 186]

The end products of lipid digestion are absorbed in two different ways, as follows:

I. Short and medium chain fatty acids (<14 carbon atoms) and glycerol are partially soluble in water. Therefore, they are absorbed directly from the intestinal epithelium without requiring prior hydrolysis or micelle formation. They pass through the villous blood capillaries and are transported as free fatty acids to the portal circulation. Therefore, they are preferentially directed to the liver for further metabolism.

II. Monoglycerides, long chain fatty acids, cholesterol, fat soluble vitamins, phospholipids, etc. They are insoluble in water. They are absorbed by the formation of micelles. The lipid particles aggregate with the bile salts and produce a circular structure called a micelle. This micelle is soluble in water and is therefore useful in transporting lipids from the lumen of the gut to cells in the intestinal lining. After entering the cells of the mucosa, monoglycerides and long chain fatty acids re-esterify to form triglycerides. Then there will be formation of chylomicrons which are the aggregation of triglycerides (87%), cholesterol esters (3%) and fat soluble vitamins. Chylomicrons are lipoproteins. They enter the lymphatic vessels through villous interstitial space and lacteals, then thoracic duct and finally to the systemic circulation.

Fate of fat after absorption:

A fat molecule can have one of the following fates after absorption[187]

- It may undergo complete oxidation in tissue.
- Can be stored as neutral fat in fat stores.
- Can be used as a building block.

Fat reserves or fat deposits:

Large amounts of fat are stored in two main tissues of the body, adipose tissue and the liver. Adipose tissue is generally referred to as fat deposits or simply adipose tissue. [188]

Adipose tissue:

The main function of adipose tissue is to store triglycerides until they are needed to provide energy to other parts of the body; it also provides thermal insulation for the body. Adipose tissue is very specific for accumulating or releasing fat depending on the situation. There are two types of fatty tissue: brown fatty tissue and white fatty tissue.

1. **Brown adipose tissue**:

It is only found in newborns. Cells contain more mitochondria. Its main function is thermogenesis.

2. **White adipose tissue:**

It represents the largest ubiquitous energy reserve in the body. Its main function is to maintain the concentration of free fatty acids in the blood.

Fat cell:

Fat is stored in fat cells from fat stores in the form of triglycerides. Fat cells in adipose tissue are modified fibroblasts that store nearly pure triglycerides in amounts up to 80-95% of total cell volume. The triglyceride inside the cell is usually in liquid form. Fat cells can synthesize very small amounts of fatty acids and triglycerides from carbohydrates. The triglycerides in fat cells are renewed about once every 2-3 weeks.

Liver lipids:

The main functions of the liver in lipid metabolism are:

- Break down fatty acids into small compounds that can be used for energy.
- To synthesize triglycerides, mainly from carbohydrates.
- Synthesize other lipids from fatty acids, especially cholesterol and phospholipids.
- Large amounts of triglycerides appear in the liver during starvation.

Triglyceride metabolism:

Dietary triglycerides are absorbed into the body and are also used in the body for the purposes of growth, development, and energy. Triglycerides are generally used when carbohydrates are not available for producing energy i.e. they have a carbohydrate sparing effect, especially when carbohydrates are deficient. The different stages of the use of triglycerides (catabolism) are [189]

- Hydrolysis: decomposition of TG into one molecule of glycerol and three molecules of fatty acid. This is done with the help of enzymes called lipases.
- Glycerol and fatty acids are transported to active tissues, where they are used.
- Glycerol is converted to glycerol-3-phosphate and enters the glycolytic pathway for energy.
- A process called "beta-oxidation" oxidizes fatty acids. Here, there will be production of acetyl-co-A (active acetate), a two-carbon atoms. The number of acetyl-co-A produced depends on the number of carbon atoms present in the fatty acids.
- Acetyl-co-A enters the Kreb cycle for the production of ATP.

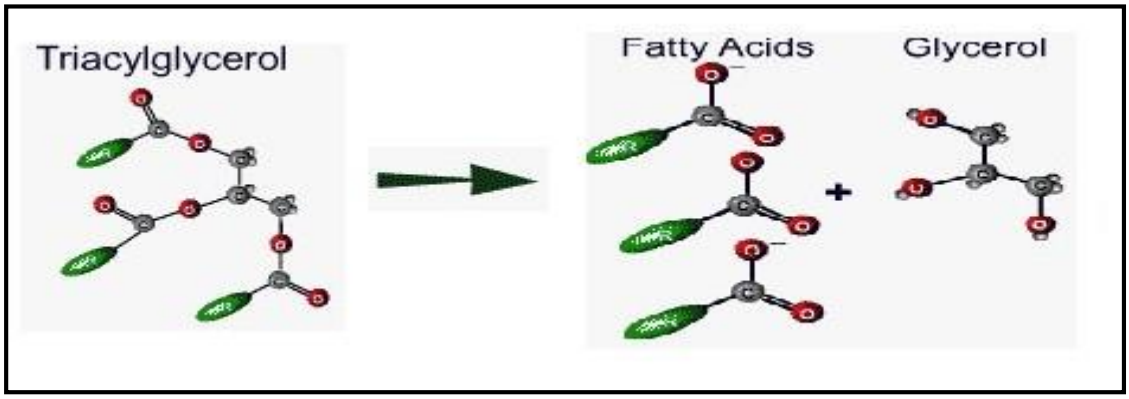


Figure 4.1: Byproducts of Triglyceride Hydrolysis

- The acetyl-co-A thus produced can have the following destinations: -[190]
- It can enter the Kreb's cycle to produce energy, CO_2 and water.
- May self-condense to acetoacetic acid (a ketone body).

a. It can enter into the Kreb's cycle.
b. It can form other ketone bodies which are used by the tissues.

- Can be used for acetylation reactions (eg synthesis of acetylcholine, etc.).
- Can be used as a construction element of bodywork elements.
- a) Cholesterol
- b) Hem-porphyrins
- c) Intermediates in the citric acid cycle and its derivatives.
- It can be used for the resynthesis of fatty acids, then fats.

Cholesterol metabolism

Cholesterol is distributed widely throughout the body. It is a light yellow crystalline solid. It is absent in plants. Its main functions are [191]

- It is a component of all cell membranes.
- Precursor of all steroid hormones, bile salts, vitamin D.
- It is a poor conductor of electricity, so it is used to insulate nerve fibres.
- A large amount of cholesterol precipitates on the cornea of the skin. This, along with other lipids, makes the skin very resistant to the absorption of water soluble substances and to the action of many chemical agents because cholesterol and other lipids are very inert to acids and many solvents which might otherwise easily penetrate on the body and above, they help prevent water evaporation from the skin. Structurally, it has 27 carbon atoms (including the cyclopentane perhydrophenanthrene ring). [192]

The structure of cholesterol is shown below.

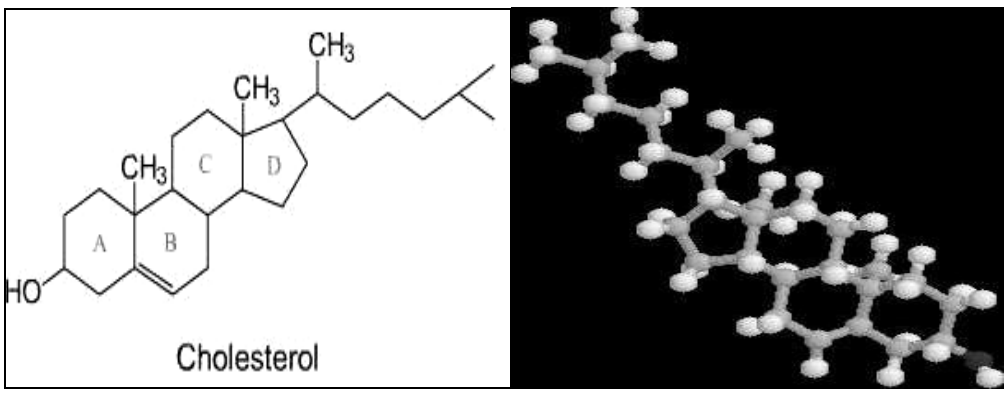


Fig 4.2: Structure of Cholesterol

Biosynthesis:

All cholesterol carbon atoms are derived from acetyl-co-A. All nucleated cells can produce cholesterol, including the arterial wall. But the main places of production are the liver (80%), the adrenal cortex, the testes, the ovaries and the intestines. The different stages involved in the production of cholesterol are shown below. [193]

- Acetyl-co-A + acetyl-co-A gives aceto-acetyl-co-A
- Aceto-acetyl-co-A + Acetyl-co-A gives HMG Co-A (a 6 C compound)
- HMG Co-A is reduced (using 2 molecules of NADPH) to form mevalonate. Here the HMG Co-A reductase enzyme is needed.
- Mevalonate decarboxylates and phosphorylates to form isopentenyl pyrophosphate (a 5C compound).
- These condense to form 30 C compounds called squalene.
- Custom cyclization and cutting processes take place in squalene to produce cholesterol.

Note: The regulatory enzyme HMG Co-A reductase is subjected to feedback regulation by cholesterol. HMG Co-A reductase will be active when the diet is low in cholesterol and through the influence of insulin and T3; but cortisol and glucagon decrease their activity.

Some of the body's cholesterol comes from food, but cholesterol is made by all body tissues. It is present in plasma, in free or esterified form. Cholesterol is the precursor to other steroid hormones. Bile is the main route of cholesterol excretion[194].

Body cholesterol pool:

A balance between the rate of cholesterol synthesis and the rate of metabolism and excretion determines the concentrations of cholesterol in tissues and body fluids. The total body cholesterol content varies from 130 to 150 g. [195]

Transport:

Cholesterol is transported by different lipoproteins [196]

- From liver to tissue via LDL
- Tissues to the liver via HDL

Cholesterol pool inside cells:

Extrahepatic tissue cells can utilize cholesterol in the following ways [197]

- To be incorporated into the cell membrane.

- To be preserved by formation of esters using acyl cholesterol acyl transferase (ACAT)
- For excretion by esterification with PUFA and adding to HDL → Liver →excretion. Here, the enzyme lecithin cholesterol acyl transferase (LCAT) helps.

Cholesterol excretion:

Out of 1000 mg of cholesterol intake:

- 500 mg are excreted (as cholesterol itself) through the bile. It can be partially reabsorbed in the intestines (30-60%); the rest is excreted in the stool.
- Another 500 mg is converted to bile acids and excreted.[198]

Blood fats (plasma lipids):

- Plasma lipids are: triglycerides, phospholipids, cholesterol, steroids, free fatty acids, etc. They are not free, but are bound to proteins.
- Free fatty acids bind to albumin and are transported to metabolically active tissues.
- Others bind to proteins (called apolipoproteins) to form ***lipoprotein complexes***, the density of which varies depending on their lipid content. Over 95% of all plasma lipids are in the form of lipoproteins. They are smaller than chylomicrons, but qualitatively similar in composition, containing triglycerides, cholesterol, phospholipids and proteins[199].

Formation and functions of lipoproteins: [200]

Almost all lipoproteins are formed in the liver (where most of the plasma cholesterol, phospholipids, and triglycerides are synthesized). In addition, small amounts of high density lipoproteins (HDL) are synthesized in the intestinal epithelium during the absorption of fatty acids.

The main function of lipoproteins is to transport the lipids that make them up in the blood. Its outer periphery contains proteins and polar heads of phospholipids and cholesterol, while the core contains triglycerides and non-polar tails of cholesterol and phospholipids.

Note: Apo lipoproteins play a crucial role in the regulation of lipid transport and lipoprotein metabolism.

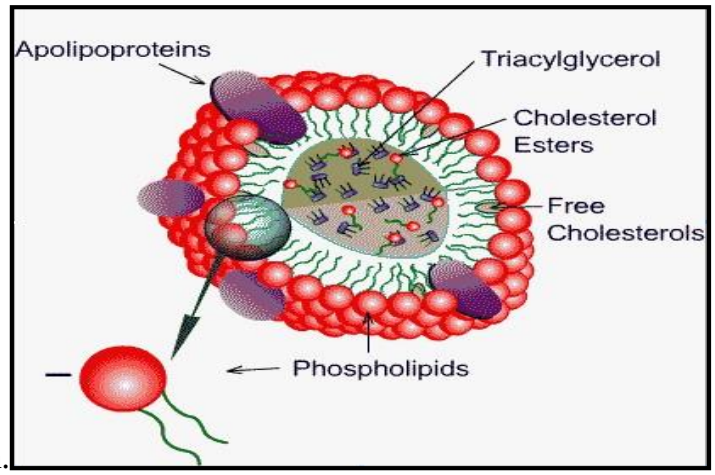


Figure 4.3: Structure of a Typical Lipoprotein

Normal Values of Plasma Lipids:[201]

- Total plasma lipids : 400 – 600 mg/dl
- Total plasma lipoproteins : up to 700 mg/dl
- Total Cholesterol : 150 –220 mg/dl
- HDL Cholesterol : Male → 30 – 60 mg/dl
  Female → 35 –75 mg/dl
- LDL Cholesterol : 80 – 175 mg/dl
- Triglycerides : Male → 50 – 200 mg/dl
  Female → 40 – 150 mg/dl
- Phospholipids : 150 – 200 mg/dl
- Free fatty acids : 10 – 20 mg/dl

Classification of Lipoproteins:

Depending upon density (by ultra-centrifugation) or on the electrophoretic mobility, the lipoproteins in plasma are classified into 5 major varieties:[202]

1. Chylomicrons
2. Very low density lipoproteins (VLDL) or pre-beta lipoproteins
3. Intermediate density lipoproteins (IDL) or broad-beta lipoproteins
4. Low density lipoproteins (LDL) or beta lipoproteins
5. High density lipoproteins (HDL) or alpha lipoproteins

Table no 4.1

Contents of different lipoproteins

Lipoprotein	Protein %	Triglycerides %	Phospholipids %	Cholesterol %
Chylomicrons	1-2	85	7	6-7
VLDLs	10	50	20	20
LDLs	25	5	20	50
HDLs	40-50	5-10	30	20

Functions of apolipoproteins:

Apolipoproteins (apos) ensure the structural stability of lipoproteins and determine the metabolic fate of the particles on which they reside. Proteins in the outer layer of lipoproteins are called apoproteins and are designated by the letters A, B, C, D, and E plus a number. In addition to helping lipoproteins become soluble in body fluids, each apoprotein has specific functions.

The main functions of apolipoproteins are: [203]

- Helps in plasma solubility
- Has a structural role (in particular Apo B 48)
- Activate enzymes:
  - Apo C II activates lipoprotein lipase
  - Apo C I activates lecithin cholesterol acyl transferase (LCAT)
- Receptor binding:
  - Apo A I is an HDL receptor ligand
  - Apo B 100 binds to LDL receptors

Characteristics of the different classes of lipoproteins:

VLDL and IDL

The liver secretes VLDL into the blood. They are acted upon by the endothelial lipoprotein lipase which are comparable to chylomicrons. The fatty acids released are stored in adipose tissue and muscles. In this manner, the function of VLDL is to transport triglycerides from the liver to adipose tissue and muscle. The remnant, called intermediate density lipoprotein (IDL), contains more cholesterol than

triglycerides. Liver cells take back half of the IDL by binding to another type of LDL receptor. From there, triglyceride molecules are gradually released, leading to the formation of LDL[204].

LDL

It is high in cholesterol (approximately 75% of plasma cholesterol is incorporated into LDL). Its half-life is 2 days. Its function is to transfer cholesterol from the liver to peripheral tissues. The LDL receptor population of the particular tissue regulates its absorption.

Whenever there is an elevation in plasma lipoprotein levels, the macrophages become activated and phagocytose them. When there is an excess of lipoproteins, cholesterol is deposited in atheromas and xanthomas.

LDLs, especially oxidized LDLs, create a procoagulant surface on the endothelium, causing blood clots to form. Oxidized LDL is found at higher levels in cigarette smokers, DM and insulin resistance. LDL cholesterol is therefore considered to be bad and atherogenic. LDL infiltrates through the artery walls and is taken up by macrophages or scavenger cells. It is the first stage of atherosclerosis[205].

HDL

It carries cholesterol from the periphery to the liver, which is then excreted in the bile. Whenever the cell membrane breaks down, cholesterol is released and rapidly absorbed by HDL through an esterification reaction mediated by the enzyme LCAT.

Factors Influencing Plasma Lipid Values[206]

I. Hormones:

- ♣ Insulin lowers plasma lipid levels. Insulin promotes the synthesis of fatty acids. Insulin inhibits lipolysis by inhibiting hormone-sensitive lipoprotein lipase in adipose tissue, and therefore the FFA concentration is lowered.

- ♣ Hormones such as cortisol, epinephrine, glucagons, ACTH, TSH, and GH cause elevation of blood lipid levels by mobilizing FFAs from adipose tissue.

- ♣ Thyroxine also mobilizes FFAs. But in Grave's disease, plasma lipid levels are lowered, and in myxedema there will be hypercholesterolemia and hypertriglyceridemia. This is because thyroxine causes increase in both lipid synthesis and catabolism. In myxedema, catabolism is more strongly inhibited, leading to the accumulation of lipids in the plasma.

- ♣ Prostaglandins also affect blood lipid levels.

- ♣ Estrogen, contained in high-dose oral contraceptive tablets, increases susceptibility to impaired lipid metabolism and predisposes the subject to atherosclerosis.

II. Nutritional factors: People who consume a lot of saturated fat in their diet are more vulnerable to hyperlipidemia and atherosclerosis.

III. Diseases: Diseases such as type II nephritis, myxedema, xanthomatosis, idiopathic hyperlipidemia, diabetes mellitus, etc. are associated with hyperlipidemia.

IV. Exercise: People who work hard tend to have relatively low plasma lipid levels.

V. Heredity: Plasma lipid values also depend to some extent on heredity.

MATERIALS AND METHODS

Ayurveda, being an ancient medical science, is established on the scientific parameters available in those times. As scientific knowledge on biology, chemistry, physics and other allied subjects started to pour into the minds, reasoning and explanation started to occupy the driver's seat. Necessity of research in Ayurveda was created due to this reason. Research is the only way available to re-establish old facts through modern methodology. It is not only useful to expand the area of knowledge, but can also help to develop and advance in various new dimensions.

"Research is an endeavor to discover new facts or correlate old facts, by scientific study of a subject or a course of critical investigation".[207]

In fact the term research is not any new thing for Ayurveda. Many centuries before modern science took its birth, Ayurveda stressed on the constant need for research in all aspects of the healing science.

Dinacharya is one of the major aspects of Ayurvedic management for the maintenance of health and sometimes to cure disease. Our *Acharyas* have set forth some rules and regulations which are to be followed during intake of food. One such rule is to take *ghrita* along with *bhojana* daily. Nowadays people remain under the misconception about *sneha* and they are scared about the high incidence of hyperlipidemia, particularly due to the intake of fatty foods, which also include *ghrita*. So the general public usually avoid taking *ghrita* in their daily diet. Whether *ghrita* really is the cause for hyperlipidemia is quite questionable.

In this regard, the present study entitled "STUDY OF SNIGDHAM ASHNEEYAAT WITH THE INTERVENTION OF GOGHRITA (COW'S GHEE) IN RELATION TO THE STATUS OF RASA DHATU AND LIPID PROFILE" has been undertaken. This work is pointed towards the aim of evaluating the physiological effect of *goghrita* on serum and the qualitative assessment of *rasa dhatu* in an honest way within the available limited sources and feasibility.

MATERIALS

- Literary study: References from various Ayurvedic classics, other ancient texts, and texts of modern physiology, reputed journals, articles and suitable websites which are relevant was collected.

- Interventional study: Individuals fulfilling inclusion criteria of both genders was collected for the study. A detailed proforma was prepared in order to collect various relevant details which are necessary for the assessment. The outcome will be based on the findings of these assessments.

- *Ghrita* used in the study was collected from a standardized diary product's firm. Ghee collected was from Karnataka milk federation – Bangalore unit with the brand name "Nandini Ghee".

- Study center: Sri Sri College of Ayurvedic Sciences and Research, Bangalore.

- Study population: Individuals for the study was recruited from various institutions run by SSRVM trust in Kanakapura road, Bengaluru.

METHODS:

A. Sample size: 100.

The individuals were divided into 2 groups. The case group consisted of 50 individuals and also control group included 50 participants in it.

B. Inclusion Criteria:

- Individuals having normal lipid profile.
- Both genders.
- Age group-20-40 yrs.
- Only *ghrita sevana arha* persons were included in the study as mentioned in the classics

C. Exclusion Criteria:

1) Individuals with the history of any systemic disorders which affect fat metabolism.
2) Individuals taking internal medication which affects fat metabolism.
3) Women who are consuming oral contraceptive pills.
4) Pregnant and lactating women.
5) Alcoholics and smokers.

D. Research Design:

Source of data: The data were collected from normal, healthy individuals of various institutions run by SSRVM trust.

Process of data collection

The demographic data of each individual was collected based on special proforma which includes the relevant data like personal data, dietary habits, bowel and bladder habits, findings of systemic examination and Ayurvediya Pareekshas.

It is an interventional trial. Healthy individuals fulfilling the inclusion criteria were selected by judgment sampling method for the study after taking informed consent. Total number of individuals was randomly divided into two groups (using simple random sampling table method), each group containing 50 individuals.

Group A: was given warm and liquid *goghrita* with meals in 2 divided doses.

Group B: was considered as control group.

Goghrita was provided for 30 days at the dose of 18 gms per day[208]. All investigations, *rasa dhatu pareekshana*, and *agni pareekshana* was carried out, before and after the study.

[To maintain uniformity in the diet pattern, a simple diet chart was given to individuals participating in both the groups]

E. Diagnostic and Assessment criteria:

1. The subjective parameters include –

i. *Rasa dhatu karma*[209]

ii. *Rasa vriddhi lakshana*[210],

iii. *Rasa kshaya lakshana*[211],

iv. *Twaksara lakshana*[212],

v. *Rasa pradoshaja vikara*[213]

vi. *Rakta sara purusha lakshana* [214] was considered.

Presence or absence of all these subjective parameters was assessed before and after the study.

Tushti (mental happiness), which is a function of *rasa dhatu*, was assessed using the questionnaire of WHO for assessment of "Quality of Life". [215]

2. The objective parameters include ---

a. Total Cholesterol
b. Triglycerides
c. H.D.L.
d. L.D.L. and
e. V.L.D.L.

Research methodology– The methodology used will be 'cohort clinical trial'.

Statistical analysis:

Scoring was given to the subjective findings. The data collected was subjected to statistical analysis through "paired t test", Annova and Pearson chi square test and other tests as per requirement.

Ethical clearance

The study topic with its aims and objectives was presented before ethical committee on July 1st 2014. Discussion about the Ethical aspects of the study was done. Ethical clearance was granted by the committee after taking into consideration the following points.

1. Collection of blood will be done twice, before and after trial.
2. Confidentiality will be strictly maintained.
3. Informed consent will be taken from the individuals who participate in the study. They will be given freedom to withdraw from the study at any point of time. They will be well informed about the nature of the study.
4. Incase any imbalance occurs in health status of the individuals during the study period, they would be referred to OPD at our hospital and treatment would be provided free of cost by the PhD scholar.

Details of intervention

On the beginning day of the course of administration of *goghrita*, the vital data such as pulse rate, heart rate, temperature, blood pressure, body weight, and respiratory rate were recorded, apart from doing all pre-assessments. Also Harvard step test was conducted to assess cardiac efficiency. Fasting blood samples (after 12 hours of fasting) were collected from the individuals. Five ml of venous blood was drawn from the median cubital vein for the purpose of investigations using disposable syringes. Blood was now put in clot activator tubes and was allowed to clot for one hour. After centrifugation it was used for assessment of serum investigations like total cholesterol, triglycerides, HDL, LDL, VLDL, which were analyzed for the study.

After 30 days of completion of study duration, the subjects were assessed again for subjective parameters, objective parameters, quality of life, weight and Harvard step test.

Method of administration

The ghee was procured from Karnataka milk federation (KMF) and all their product are sold under the brand name “Nandini”. In the initial level milk is collected in all the small branches of diary in every village by measuring its standards using lactometer. Milk is then transported to main dairy units located at district headquarters. The milk collected from various places is now collected in big tanks and milk is subjected to centrifugation. The butter which is available after centrifugation

is then collected and heated to obtain ghee. Thus produced ghee is maintained at "Agmark standards". [216]

The required dose of *goghrita* for the full study period of 30 days, for an individual was calculated as 600 ml and was measured and separately bottled. A bottle along with a spoon which had a capacity of 5ml was given to the individuals. The individuals were advised to liquefy the ghee by keeping it in a hot water trough and consume two spoon of *goghrita* twice in a day along with food and were advised to take hot water after that. A simple diet chart was provided (which was prepared for the study purpose) and individuals were advised to follow the same.

Monitoring of study subjects

Individuals were regularly monitored and enquired whether they were facing any sort of change in health status during the study period and necessary modifications and advice were given to them.

Diet Chart

Diet pattern was more or less similar to all the individuals who participated in the study as the participants were selected from various institutions of SSRVM trust they receive a common food from the Art of Living ashram kitchen. A simple diet chart was prepared in order to check the intake of any high calorie food items.

Assessment Parameters of Vitality

In the present study the following vital data have been checked thoroughly and accurately before the blood sample was collected initially.

- **Blood Pressure**

The arterial blood pressure from the left upper limb, when the individual was in sitting posture, was recorded. Palpatory method and auscultatory method both were employed.

Instruments used: Deluxe BP apparatus, Stethoscope.

- **Resting Pulse Rate**

The individual was asked to sit comfortably and then the pulse of the radial artery at left wrist joint was counted for 1whole minute. While counting the pulse, the rhythm, volume and character were also noted to odd out any impending pathology.

Materials used- Stopwatch.

- **Temperature**

The body temperature of the study participant was recorded by using the standard clinical thermometer. Despite the variations of body temperature at different parts of the body, temperature recorded in Fahrenheit scale from mouth (oral temperature) was used for assessment.

Materials used: Standard clinical thermometer, Surgical spirit, Cotton, Stopwatch.

- **Resting Heart Rate**

The subject was asked to be seated comfortably on the examination table. Heart rate was recorded at the apex of the heart by auscultation. Other auscultatory areas, were also auscultated to rule out any abnormalities, apart from looking for normal cardiac sounds and adventitious sounds. The HR was counted for the period of one whole minute.

Materials used- Stethoscope, Stopwatch.

- **Resting Respiratory Rate**

The respiratory rate was assessed, while the subject was in the sitting posture and with least clothes at chest region.

Materials used- Stopwatch.

- **Body weight**

The weight of the individual was checked before and after the trial using the weighing machine. While checking the weight, the machine was calibrated every time and the subject was wearing minimum clothes, without footwear, standing erect on

the platform of weighing machine and facing in the forward direction. The same machine was used throughout the study.

Materials used- Digital Weighing machine.

- **HARVARD STEP TEST** [217]

The Harvard step test is a type of cardiac stress test for measurement of fitness and a person's ability to recover after a strenuous exercise. The more quickly the heart rate returns to resting, the better shape the person is in.

Procedure: The study participant steps up and down on the platform having a height of 20 inches at a rate of 30 steps per minute (every two seconds) for 5 minutes or until exhaustion. Exhaustion is defined as when the person cannot maintain the stepping rate for 15 seconds. The participant immediately sits down on completion of the test, and the total number of heart beats is counted between 1 to 1.5 minutes after finishing. **Scoring:** The Fitness Index score is determined by the following equations.

Fitness Index (short form) = (100 x test duration in seconds) divided by (5.5 x pulse count between 1 and 1.5 minutes).

The ratings and the fitness index is as mentioned below:

Table no. 5.1

Ratings and fitness index of Harvard step test

Rating	Fitness index (long form)
Poor	< 54
Low average	54 - 67
Average	68 - 82
Good	83 - 96
Excellent	> 96

Fitness Index (long form) = (100 x test duration in seconds) divided by (2 x sum of heart beats in the recovery periods).

The long form of the fitness index calculation method was adopted in this study. i.e; pulse rate was calculated between 1 to 1.5 min, 2 to 2.5 min and 3 to 3.5 min. the sum total of this was multiplied by two. The test duration in seconds was multiplied by 100 and was calculated.

Harvard step test was repeated after the study to assess improvement in cardiac efficiency.

Assessment of *Aharashakti*

Two ways were used to assess abhyavaharana Shakti viz., assessing the *Abhyavaharana shakti* and *Jaranashakti,* using standard scoring methods of subjective symptoms related to them.

Abhyavaharanashakti

Person taking food in much quantity –1
Person taking food in moderate quantity – 2
Person taking food in less quantity – 3

***Jaranashakti*:**

Based on the presence of *Jirnaahara lakshana* (symptoms of digested food) such as: *laghuta* (lightness), *utsaha* (enthusiasm), *kshudhapravritti* (feeling of hunger), *trishna pravritti* (feeling of thirst), *udgarashuddhi* (purification in belching), *yathochita malotsarga* (proper evacuation of fecal matter) scorings were given.

In addition to this *lakshanas* of benefits of *snigdha bhojana* were also assessed before, after and after completion of 1 month of the study to check whether continued effect is present or absent.

Assessment of parameters

Rasa dhatu karma, *vriddhi* and *ksahya lakshana*, *twak sara lakshana*, *rakta sara lakshana*, symptoms of *rasa pradoshaja vikara*, were assessed as per the format prepared for the same in the case record form

WHOQOL [218]

The WHOQOL-100 quality of life assessment is developed by the WHOQOL Group with fifteen international field centers, in an attempt to develop a quality of life assessment that would be applicable cross-culturally anywhere in the world. This document gives a conceptual background to the definition of quality of life and describes the development of the WHOQOL-BREF, a version which is abridged.

Assessment of Serum contents

The lipid profile investigation, carried out in this work was done at the Clinical Laboratory of Sri Sri College of Ayurvedic Science and Research Hospital, Bangalore. All the serum investigations were done with the help of erba chem 5 plus semi auto analyzer using the biochemical reagent kits supplied by the erba company. Kits from the same company and same batch number were retained for each examination throughout this study.

The fasting blood samples (after 12 hours of fasting) were collected from the individuals before intervention. After 30 days of continuous intake of goghrita the procedure was repeated. The extracted blood samples were carefully labeled with the sample name and number at the time of collection. The investigator (laboratory technician) was blinded to avoid bias in the study. After allowing the blood samples to clot at room temperature for 20 minutes, they were centrifuged for 15 minutes at a speed of 3000 rpm.

Daily QC (quality control) was maintained and standard was run prior to test conduction.

OBSERVATIONS AND RESULTS

In this intervention study individuals fulfilling the inclusion criteria were selected at random. There were 50 individuals in each group (case and control) age group 20-40 years who participated in this study. Observations were recorded before and after the course of administration of goghrita. As per the specially prepared proforma which includes the demographical and vital data, observations were made regarding the distribution according age, gender, religion, educational status, habitat, diet factor etc. This part contains the description of statistical analysis of the data obtained along with the observation. All observations were tabulated and represented with charts wherever found essential.

The variables used in the case record form were analyzed statistically and its outcomes have been enlisted below.

Age

Table 6.1

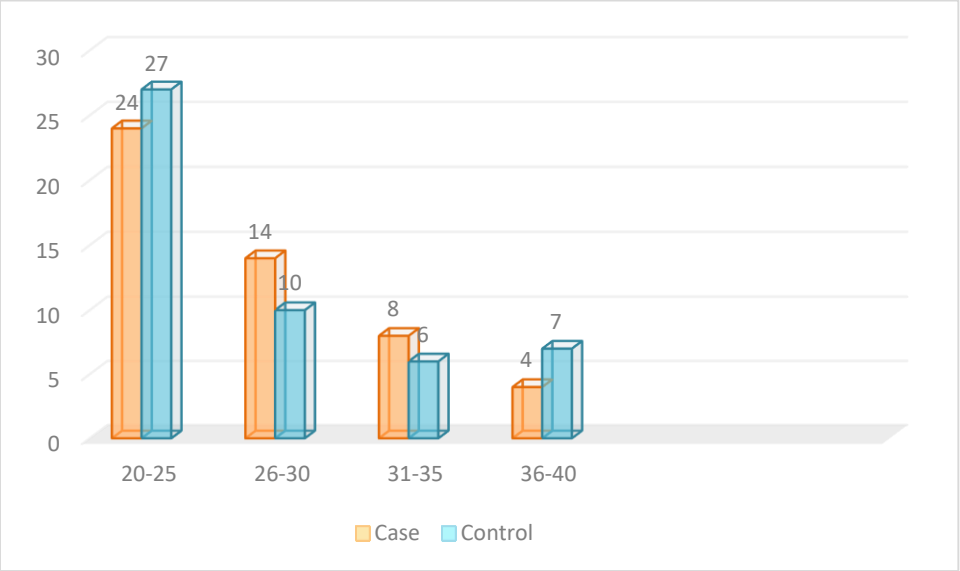
Agewise distribution of study participants

		Case	Control	Total	Pearson Chi-Square	Remarks
Ages	20-25	24	27	51	.583	Not significant
	26-30	14	10	24		
	31-35	8	6	14		
	36-40	4	7	11		
Total		50	50	100		
Mean		26.5600	26.6800	26.6200		

The participants who took part in the present study belong to an age group of 20- 40 years. Out of them total 51participants belonged to an age group of 20-25 yrs. Next highest number of participants was in the age group of 26 to 30 yrs. 14 participants were found to be in the age group of 30 to 35 years and 11 of them were belonging to the age group f 36 to 40 years. As there as varied number of people in different age groups, the age factor was not statistically found significant in the current study

Graph 1

Agewise distribution of study participants



Gender

Table 6.2

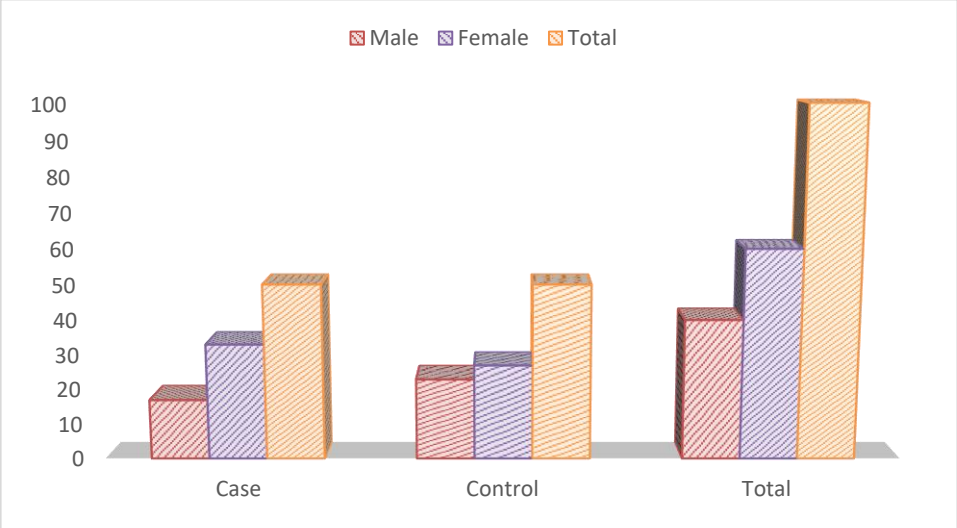
Genderwise distribution of study participants

		Case	Control	Total	Pearson Chi-Square	Remarks
Gender	Male	17	23	40	.221	Not Significant
	Female	33	27	60		
Total		50	50	100		

Among the 100 study participants 60 of them were females and remaining 40 of them were males. The gender of the participants was found to be statistically not significant.

Graph 2

Genderwise distribution of study participants



Religion

Table 6.3

Religion wise distribution of study participants

		Case	Control	Total
Religion	Hindu	50	50	100

All the study participants both in the trial and the control group belonged to the hindu religion.

Occupation

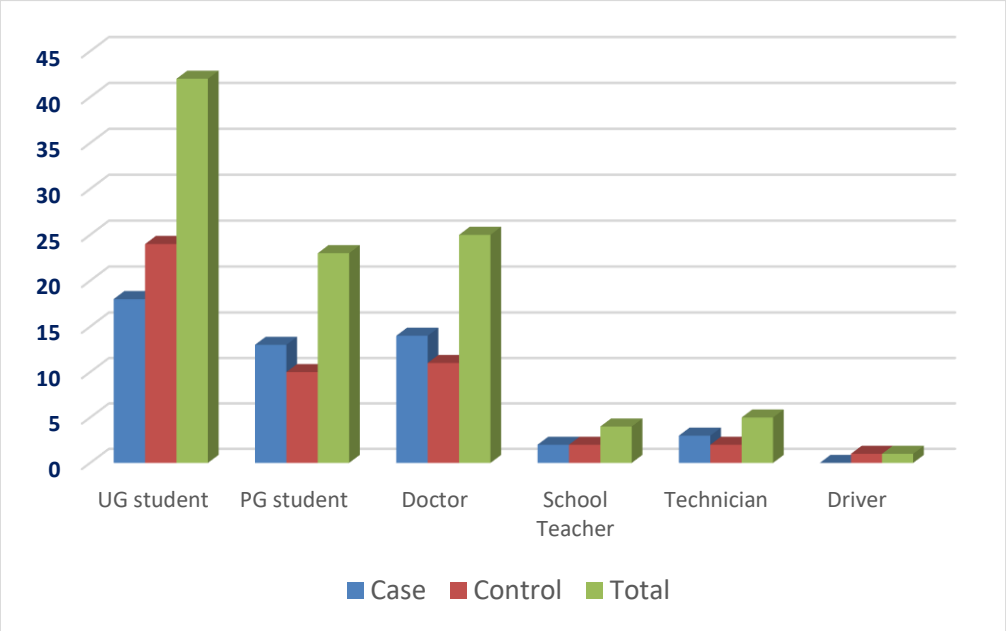
Table 6.4

Occupation wise distribution of study participants

		Case	Control	Total	Pearson Chi-Square	Remarks
Occupation	UG student	18	24	42	.729	Not Significant
	PG student	13	10	23		
	Doctor	14	11	25		
	School Teacher	2	2	4		
	Technician	3	2	5		
	Driver	0	1	1		
Total		50	50	100		

Graph 3

Occupation wise distribution of study participants



As the study was conducted in the campus of Sri Sri College of Ayurvedic science and research hospital, participants were selected from the same campus who were UG students, PG students, physicians, Sri Sri Ravishankar Vidya Mandir school teachers, laboratory technicians, solar energy training center, transport department etc. So no particular group was found to have statistical significance though the number of UG were found to be more.

Diet

Table 6.5

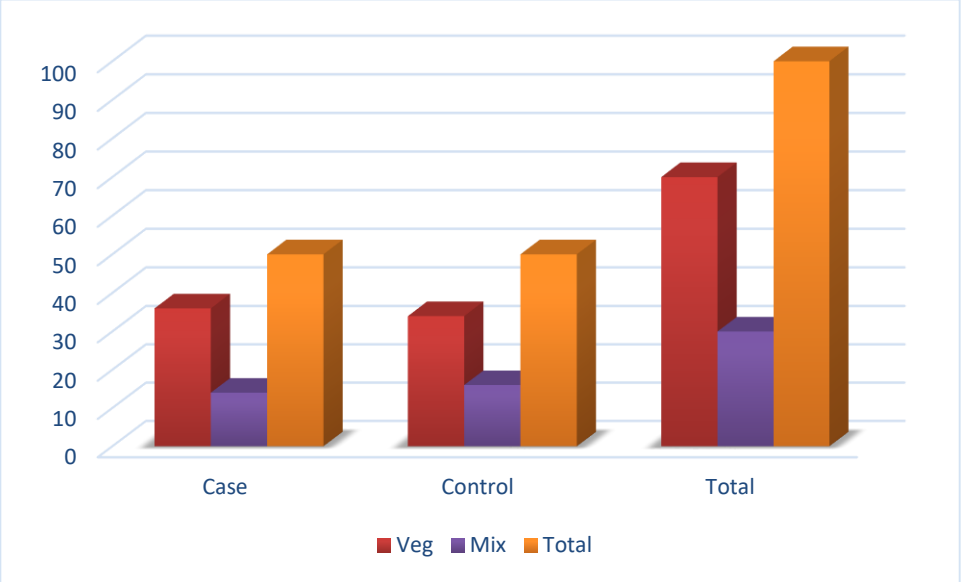
Dietwise distribution of study participants

		Case	Control	Total	Pearson Chi-Square	Remarks
Diet1	Veg	36	34	70	.663	Not Significant
	Mix	14	16	30		
Total		50	50	100		

The study participants include both vegetarians and non-vegetarians. Among them though vegetarians were in greater number this factor was found to be not significant in the current study.

Graph 4

Dietwise distribution of study participants



Frequency of diet

Table 6.6

Frequency of food consumption

		Case	Control	Total	Pearson Chi-Square	Remarks
Frequency	1	22	26	48	.045	Highly significant
	2	24	13	37		
	3	2	2	4		
	4	2	9	11		
Total		50	50	100		

Among the study participants people who consumed food less than 4 times per day were more in number, those who consumed food 4 times per day were around 37 among 100 study participants and those who consumed food more than 4 times were four in number and those who did not have a fixed pattern in frequency of food intake were around 11 out of 100 participants. This factor i.e; frequency of consumption of diet was found to be significant statistically.

NonVeg consumption

Table 6.7

Frequency of nonveg consumption among the study participants

		Case	Control	Total	Pearson Chi-Square	Remarks
NonVeg consumption	1	3	2	5	.072	Not significant
	2	2	9	11		
	3	2	0	2		
	4	2	4	6		
	6	2	2	4		
	8	3	0	3		
Total		14	17	31		

Among the study participants those who were non vegetarians, 5 of them consumed non veg food items at a frequency of once in a month, 11 of them consumed twice in a month, 2 individuals consumed thrice in a month, 6 of them consumed 4 times in a month, and 3 of them consumed 8 times in a month. This was found statistically not significant.

Appetite

Table 6.8

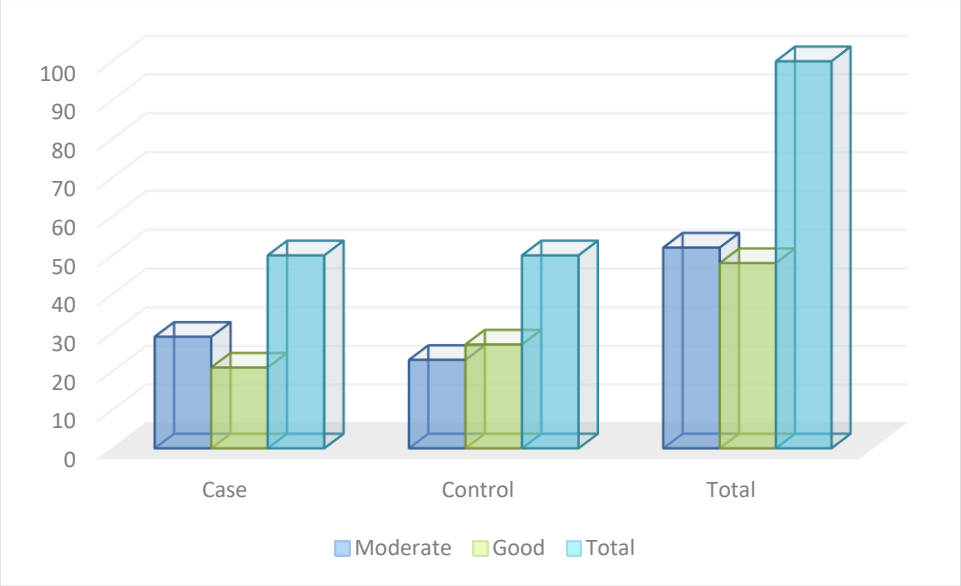
Appetite wise distribution of study participants

		Case	Control	Total	Pearson Chi-Square	Remarks
Appetite	Moderate	29	23	52	.230	Not Significant
	Good	21	27	48		
Total		50	50	100		

Among the study participants 52 of them had moderate appetite and 48 of them had good appetite. This was also statistically not significant

Graph 5

Appetite wise distribution of study participants



Staple rice

Table 6.9

Distribution of study participants consuming rice as staple diet

		Case	Control	Total	Pearson Chi-Square	Remarks
Staple rice	Yes	37	38	75	.817	Not significant
	No	13	12	25		
Total		50	50	100		

Majority of the study participants were consuming their staple diet as rice and 25 of them did not have rice as their staple food. This was also statistically not significant.

Staple wheat

Table 6.10

Distribution of study participants consuming wheat as staple diet

		Case	Control	Total	Pearson Chi-Square	Remarks
Staple wheat	Yes	18	16	34	.306	Not Significant
	No	30	34	64		
	3.00	2	0	2		
Total		50	50	100		

Among the study participants those were consuming their staple diet as wheat were 34 and remaining did not have wheat as their staple food. This was also statistically not significant.

Dairy products

Table 6.11

Distribution of study participants based on consumption of dairy products

		Case	Control	Total	Pearson Chi-Square	Remarks
Dairy products	Yes	50	41	91	.002	Highly significant
	No	0	9	9		
Total		50	50	100		

In the current study almost all participants were consuming dairy products, 91 among the 100 participants consumed one or the other form of dairy products. This was statistically found to be highly significant.

Fried food

Table 6.12

Distribution of study participants based on consumption of fried food stuffs

		Case	Control	Total	Pearson Chi-Square	Remarks
Fried food	Yes	35	31	66	.398	Not Significant
	No	15	19	34		
Total		50	50	100		

Among the study participants, though 66 of them consumed fried food items, and the remaining did not consume fried food stuffs. This was found statistically as not significant.

Fish

Table 6.13

Distribution based on consumption of fish among nonveg consuming participants

		Case	Control	Total	Pearson Chi-Square	Remarks
Fish	Yes	10	6	16	.275	Not Significant
	No	40	44	84		

Total	50	50	100		

Among the study participants, less number i.e; 16 of them consumed fish, as this was very less, it was statistically found as not significant.

Beef

Table 6.14

Distribution based on consumption of beef among nonveg consuming participants

		Case	Control	Total	Pearson Chi-Square	Remarks
Beef	Yes	3	0	3	.079	Not significant
	No	47	50	97		
Total		50	50	100		

Among the study participants, very less number i.e; 3 of them consumed beef, as this was very less, it was statistically found as not significant.

Mutton

Table 6.15

Distribution based on consumption of mutton among nonveg consuming participants

		Case	Control	Total	Pearson Chi-Square	Remarks
Mutton	Yes	6	2	8	.140	Not Significant
	No	44	48	92		
Total		50	50	100		

In the current study 8 participants, consumed mutton among the non veg foods they consumed. It was statistically found as not significant.

Chicken

Table 6.16

Distribution based on consumption of chicken among nonveg consuming participants

		Case	Control	Total	Pearson Chi-Square	Remarks
Chicken	Yes	12	16	28	.373	Not Significant
	No	38	34	72		
Total		50	50	100		

In the current study, 28 of them consumed chicken in their diet and 72 of them did not consume. This was also statistically not significant.

Icecream

Table 6.17

Distribution of study participants based on consumption of ice cream

		Case	Control	Total	Pearson Chi-Square	Remarks
Icecream	Yes	35	30	65	.295	Not Significant
	No	15	20	35		
Total		50	50	100		

In this study 65 of the study participants consumed ice cream and 35 did not consume. This was also not significant.

Cake

Table 6.18

Distribution of study participants based on consumption of cake

		Case	Control	Total	Pearson Chi-Square	Remarks
Cake	Yes	31	25	56	.227	Not Significant
	No	19	25	44		
Total		50	50	100		

Among the study participants, 56 of them consumed cake and 44 of them did not consume. It was statistically found as not significant.

Puff

Table 6.19

Distribution of study participants based on consumption of puff

		Case	Control	Total	Pearson Chi-Square	Remarks
Puff	Yes	11	19	30	.081	Not significant
	No	39	31	70		
Total		50	50	100		

Among the list of bakery products 30 among the study participants consumed puff and the remaining 70 did not consume. This was also not significant when analyzed statistically.

Condiments

Table 6.20

Distribution of study participants based on consumption of condiments

		Case	Control	Total	Pearson Chi-Square	Remarks
Condiments	Yes	22	16	38	.216	Not Significant
	No	28	34	62		
Total		50	50	100		

38 among the study participants consumed condiments and 62 of them did not consume condiments, this was also statistically found as not significant.

Burger

Table 6.21

Distribution of study participants based on consumption of burger

		Case	Control	Total	Pearson Chi-Square	Remarks
Burger	Yes	6	9	15	.401	Not Significant
	No	44	41	85		
Total		50	50	100		

In the current study 15 participants took burger and the remaining 85 did not consume. This was also statistically found not significant.

Chats

Table 6.22

Distribution of study participants based on consumption of chats

		Case	Control	Total	Pearson Chi-Square	Remarks
Chats	Yes	33	26	59	.155	Not Significant
	No	17	24	41		
Total		50	50	100		

Though many of the participants ie; 59 of them consumed chats, 41 of them didn't consume chats. This was statistically found to be not significant.

Pizza

Table 6.23

Distribution of study participants based on consumption of pizza

		Case	Control	Total	Pearson Chi-Square	Remarks
Pizza	Yes	18	17	35	.834	Not significant
	No	32	33	65		
Total		50	50	100		

35 participants took pizza occasionally and the remaining did not consume pizza. This was statistically found to be not significant.

Chips

Table 6.24

Distribution of study participants based on consumption of chips

		Case	Control	Total	Pearson Chi-Square	Remarks
Chips	Yes	33	30	63	.534	Not Significant
	No	17	20	37		
Total		50	50	100		

Among the study participants 63 of them consumed chips and the rest 37 did not consume. This was found to be insignificant statistically.

Toast

Table 6.25

Distribution of study participants based on consumption of toast

		Case	Control	Total	Pearson Chi-Square	Remarks
Toast	Yes	16	18	34	.673	Not significant
	No	34	32	66		
Total		50	50	100		

Among the study participants 34 of them ate toast and rest 66 did not consume it. This was also statistically not significant.

Bread

Table 6.26

Distribution of study participants based on consumption of bread

		Case	Control	Total	Pearson Chi-Square	Remarks
Bread	Yes	32	22	54	.045	Significant
	No	18	28	46		
Total		50	50	100		

In the current study, 54 of them consumed bread and 46 of them did not consume it. This was found to be statistically significant.

Tea

Table 6.27

Distribution of study participants based on consumption of tea

		Case	Control	Total	Pearson Chi-Square	Remarks
Tea	Yes	28	33	61	.305	Not Significant
	No	22	17	39		
Total		50	50	100		

Among the study participants, 61 of them consumed tea and the remaining did not consume. This was statistically not significant.

Coffee

Table 6.28

Distribution of study participants based on consumption of coffee

		Case	Control	Total	Pearson Chi-Square	Remarks
Coffee	Yes	15	13	28	.656	Not significant
	No	35	37	72		
Total		50	50	100		

In the current study 28 of them consumed coffee and the remaining did not consume. This was statistically not significant.

Milk

Table 6.29

Distribution of study participants based on consumption of milk

		Case	Control	Total	Pearson Chi-Square	Remarks
Milk	Yes	38	26	64	.012	Highly significant
	No	12	24	36		
Total		50	50	100		

Among the study participants 64 of them consumed milk and 36 of them did not consume milk. This was found to be statistically highly significant.

Juice

Table 6.30

Distribution of study participants based on consumption of juice

		Case	Control	Total	Pearson Chi-Square	Remarks
Juice	Yes	27	32	59	.309	Not Significant
	No	23	18	41		
Total		50	50	100		

In the current study 59 of them consumed juice and 41 of them did not consume. This was statistically not significant.

Soft Drinks

Table 6.31

Distribution of study participants based on consumption of soft drinks

		Case	Control	Total	Pearson Chi-Square	Remarks
Soft Drinks	Yes	7	10	17	.424	Not Significant
	No	43	40	83		
Total		50	50	100		

In the current study majority of the participants did not consume soft drinks and 17 of them consumed soft drinks. This was also statistically not significant.

Water Quantity

Table 6.32

Distribution of study participants based on consumption of water

		Case	Control	Total	Pearson Chi-Square	Remarks
Water Quantity	<2	8	11	19	.005	Highly significant
	2-4	32	30	62		
	>4	0	7	7		
	Not fixed	10	2	12		
Total		50	50	100		

In the current study data was collected regarding the water intake quantity. Most of the study participants, i.e; 62 of them consumed water about 2-4 liters. 19 of them consumed less than 2 liters of water, 7 of them consumed more than 4 liters of water and 12 of them did not have a fixed quantity of water consumption. This was found to be statistically highly significant.

Cooked food consumption

As all of the study participants used cooked food in both case and control groups, this cannot be analyzed statistically as it remains a constant.

Uncooked

Table 6.33

Distribution of study participants based on consumption of uncooked food

		Case	Control	Total	Pearson Chi-Square	Remarks
Uncooked	No	49	48	97	.558	Not Significant
	Yes	1	2	3		
Total		50	50	100		

Majority of the study participants did not consume uncooked food and this was statistically found as not significant.

Fried

Table 6.34

Distribution of study participants based on consumption of fried foods

		Case	Control	Total	Pearson Chi-Square	Remarks
Fried	No	43	16	59	.000	Highly significant
	Yes	7	34	41		
Total		50	50	100		

59 among the study participants consumed fried food and the remaining 41 of them did not consume it. This was statistically found to be highly significant.

Fast Food

Table 6.35

Distribution of study participants based on consumption of fast food

		Case	Control	Total	Pearson Chi-Square	Remarks
Fast Food	No	44	46	90	.505	Not Significant
	Yes	6	4	10		
Total		50	50	100		

90 of them did not consume the fast food and remaining 10 of them consumed it. This was statistically not significant.

Oil used for cooking purposes

Sunflower

Table 6.36

Distribution of study participants based on usage of sunflower oil for cooking

	Case	Control	Total	Pearson Chi-Square	Remarks

Sunflower	No	17	13	30	.383	Not Significant
	Yes	33	37	70		
Total		50	50	100		

In the current study data was collected regarding the usage of cooking oil to see whether it has any effect over the lipid profile. People who used sunflower were about 70 and 30 of them did not use this oil for cooking purposes. This was statistically not significant.

Coconut

Table 6.37

Distribution of study participants based on usage of coconut oil for cooking

		Case	**Control**	**Total**	**Pearson Chi-Square**	**Remarks**
Coconut	No	45	42	87	.372	Not Significant
	Yes	5	8	13		
Total		50	50	100		

13 among the study participants used coconut oil for cooking purposes and 87 didn't use this oil. This was also not significant when analyzed statistically.

Groundnut

Table 6.38

Distribution of study participants based on usage of groundnut oil for cooking

		Case	Control	Total	Pearson Chi-Square	Remarks
Groundnut	No	33	41	74	.068	Not significant
	Yes	17	9	26		
Total		50	50	100		

26 among the study participants used groundnut oil whereas 74 of them did not use. This was also statistically not significant.

Ghee

Table 6.39

Distribution of study participants based on usage of ghee for cooking

		Case	Control	Total	Pearson Chi-Square	Remarks
Ghee	No	40	37	77	.476	Not Significant
	Yes	10	13	23		
Total		50	50	100		

23 among the study participants used ghee and others did not consume it. This was also statistically not significant.

Palmoil

Among the study participants none of them used palm oil for cooking purpose. So it remains as a constant when statistically analyzed.

Others

Table 6.40

Distribution of study participants based on usage of other oils for cooking

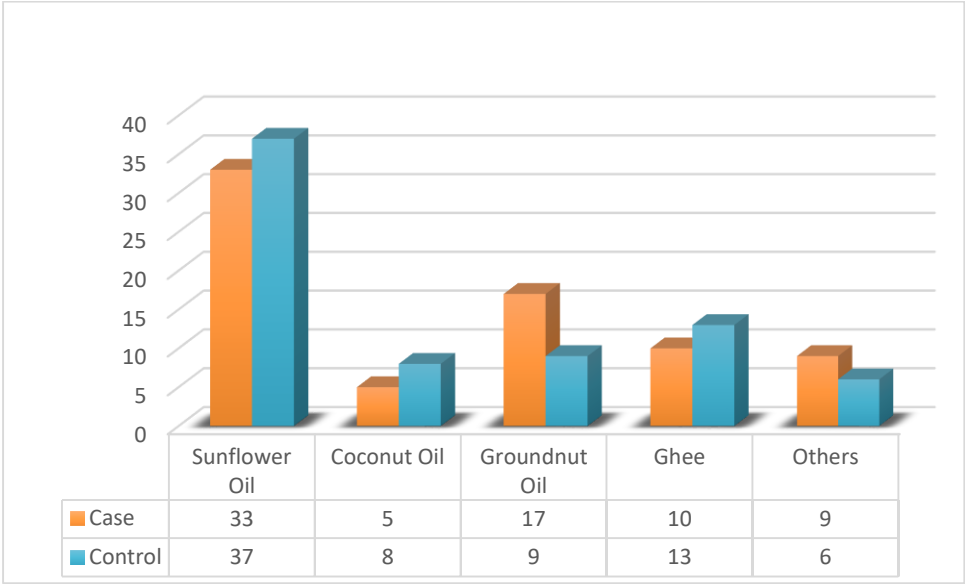
	Case	Control	Total	Pearson Chi-Square	Remarks

Others	No	41	44	85	.401	Not Significant
	Yes	9	6	15		
Total		50	50	100		

15 among the study participants used other oils for cooking purpose. This was also found as statistically not significant.

Graph 06

Distribution of study participants based on usage of cooking oil



Exercise

Table 6.41

Distribution of study participants based on habit of exercising

		Case	Control	Total	Pearson Chi-Square	Remarks
Exercise	Yes	22	26	48	.423	Not Significant
	No	28	24	52		
Total		50	50	100		

Among the study participants 48 of them had the habit of exercising and other 52 of them didn't have this habit. This was also found to be statistically not significant.

Type of exercise

Table 6.42

Distribution of study participants based on intensity of exercise followed

		Case	Control	Total	Pearson Chi-Square	Remarks
Type of exercise	Mild	13	15	28	.922	Not significant
	Mod	9	11	20		
Total		22	26	48		

Among the participants who performed exercises, 28 of them did mild exercise and 20 of them did moderate exercise. This was also statistically insignificant.

Nature of Sleep

Table 6.43

Distribution of study participants based on nature of sleep

		Case	Control	Total	Pearson Chi-Square	Remarks
Nature of Sleep	Disturbed	10	2	12	.014	Significant
	Undisturbed	40	48	88		
Total		50	50	100		

The nature of sleep among the study participants, 88 of them had undisturbed sleep and remaining 12 of them had disturbed sleep. This was statistically found to be significant.

Sleep Hours

The data duration of sleep of the study participants showed that 18 of them had less than 6 hours of sleep, 32 of them had 6 hours of sleep, 45 amongst them had more than 6 hours of sleep and 4 of them had not got any fixed pattern for sleep. This was found as statistically insignificant.

Day Sleep

Among the study participants 10 of them slept during day time and remaining 90 of them did not. This was also statistically not significant.

Day Sleep Hours

Among the 10 participants who slept during day time 2 of them slept less than 1 hour, 4 of them slept for an hour, and remaining 4 didn't have a fixed duration of day sleep. This was also not found as significant.

Bowel habit

Among the study participants 89 of them had regular bowel habits while 11 of them had irregular bowel movements. This factor was also found as not significant statistically.

Bowel nature

The bowel nature among the study participants 87 of them had formed stools, 4 of them had loose stools and 9 of them had constipation. This was statistically found as not significant.

Micturition Quantity

98 among the study participants had normal quantity of micturition and 2 of them had excessive quantity of voiding of urine. This variable was also found as not significant statistically.

Nature of Work

Table 6.44

Distribution of study participants based on nature of work.

		Case	Control	Total	Pearson Chi-Square	Remarks
Nature of Work	Sedentary	6	14	20	.032	Significant
	Physical strain	2	0	2		
	Sedentary + mental strain	35	31	66		
	Both physical + mental strain	7	5	12		

Total	50	50	100		

Among the study participants 20 of them had sedentary type of nature of work, 2 of them had physical strain, 62 of them had sedentary and mental strain involved in their work nature, 12 of them had both physical and mental strain involved. This was statistically found to be significant.

Mental status

Table 6.45

Distribution of study participants according to their mental status.

		Case	**Control**	**Total**	**Pearson Chi-Square**	**Remarks**
Anxious	Yes	11	15	26	.000	Highly significant
	No	39	0	39		
Depressive	Yes	11	4	15	.001	Highly significant
	No	39	0	39		
Sentimental	Yes	30	33	63	.000	Highly significant
	No	20	0	20		
Jolly	Yes	40	37	77	.004	Highly significant
	No	10	0	10		
Irritable	Yes	11	18	29	.000	Highly significant
	No	39	0	39		
Aggressive	Yes	9	18	27	.000	Highly significant
	No	41	0	41		
Normal	Yes	48	38	86	.212	Not Significant
	No	2	0	2		

Anxious - The emotional status of the participants was analyzed and 26 of them had anxious state of mind. This was statistically found to be highly significant.

Depressive - 15 among the study participants had depressive emotional status and this was also found to be highly significant statistically.

Sentimental - 63 among the study participants had sentimental emotional status and remaining 20 didn't have this mental state. This was also found to be statistically highly significant.

Jolly

77 among the study participants had jolly emotional status and this was also found to be highly significant statistically.

Irritable

29 among the study participants had irritable emotional status and this was also found to be highly significant statistically.

Aggressive

27 among the study participants had aggressive emotional status and this was also found to be highly significant statistically.

Normal

86 among the study participants had normal emotional status and this was found to be not significant statistically.

Habits

Beetle Chewing

Table 6.46

Distribution of study participants based on the habit of beetle chewing

		Case	**Control**	**Total**	**Pearson Chi-Square**	**Remarks**
Beetle Chewing	Yes	0	3	3	.079	Not significant
	No	50	47	97		
Total		50	50	100		

Among the study participants only 3 of them had the habit of chewing beetle nut. This was found to be not significant statistically.

Built & Nourishment

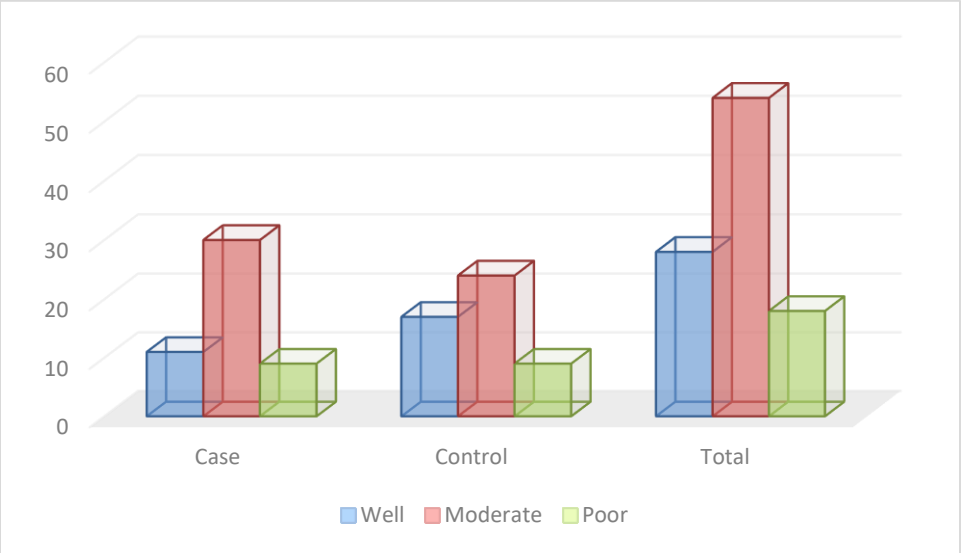
Table 6.47

Distribution of study participants based on built and nourishment

		Case	Control	Total	Pearson Chi-Square	Remarks
Built Nourishment	Well	11	17	28	.377	Not Significant
	Moderate	30	24	54		
	Poor	9	9	18		
Total		50	50	100		

Graph 7

Distribution of study participants based on built and nourishment



Among the study participants only 28 of them were well built, 54 of them were moderately built and nourished and 18 were poorly built and nourished. This was found to be not significant statistically.

Weight

Table 6.48

Tabulation of study participants based on weight (Descriptive statistics)

	Group	**Mean**	**Std. Deviation**
Weight Before Trial	Case	59.5280	12.16828
	Control	63.8200	14.34133
	Total	61.6740	13.40655
Weight After Trial	Case	59.6960	12.04246
	Control	64.5020	14.37544
	Total	62.0990	13.41244

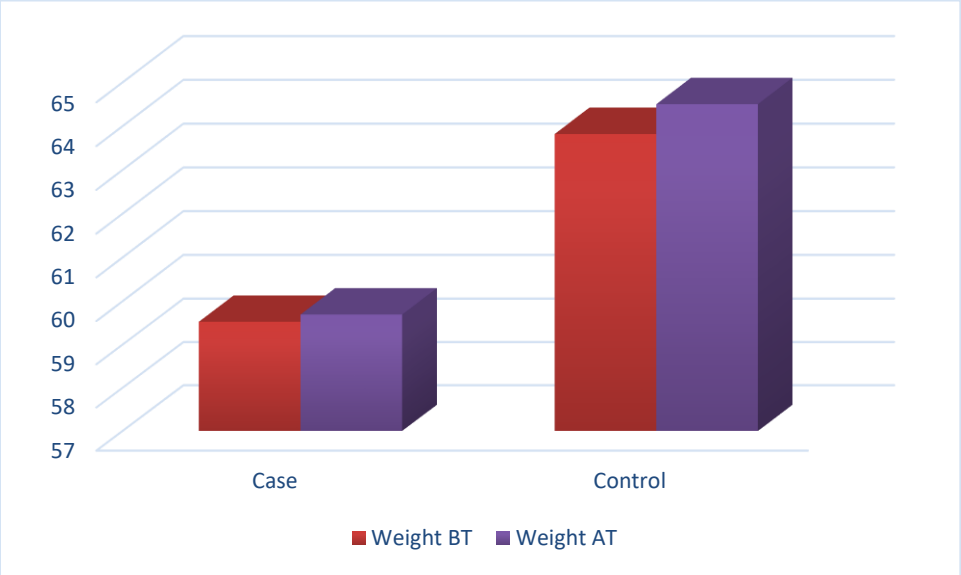
Table 6.49

Tabulation of study participants based on weight (inferential statistics)

Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Change	9.031	1	9.031	22.787	.000
Change * group	3.302	1	3.302	8.332	.005
Error(change)	38.841	98	.396		

Graph 8

Tabulation of study participants based on weight



Weight of the participants was measured before and after administration of goghrita. While comparing the means it was observed that in case group there was a slight increase in weight and also increase was observed in the control group. The changes within the group and in between the 2 groups were statistically found to be very highly significant.

Harvard step test

Table 6.50

Tabulation of study participants based on Harvard step test (descriptive statistics)

	Group	Mean	Std. Deviation	N
Step test BT	Case	69.3016	23.75066	50
	Control	71.4320	17.94439	50
	Total	70.3668	20.96946	100
Step test AT	Case	71.1658	23.17362	50

	Control	67.6342	17.26088	50
	Total	69.4000	20.40612	100

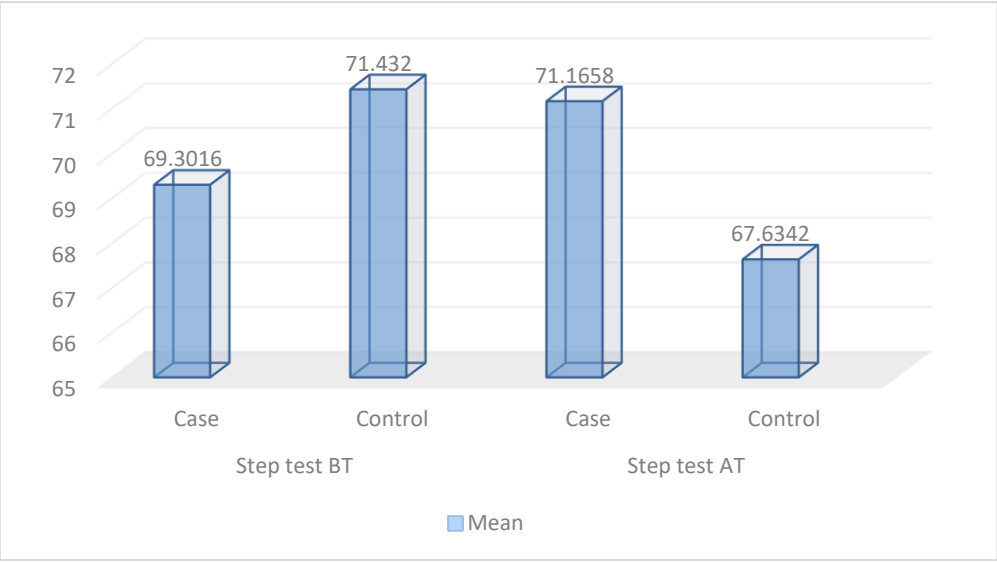
Table 6.51

Tabulation of study participants based on Harvard step test (inferential statistics)

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Change	Sphericity Assumed	46.735	1	46.735	12.859	.001
Change * group	Sphericity Assumed	400.728	1	400.728	110.257	.000
Error(change)	Sphericity Assumed	356.179	98	3.634		

Graph 9

Tabulation of study participants based on Harvard Step Test

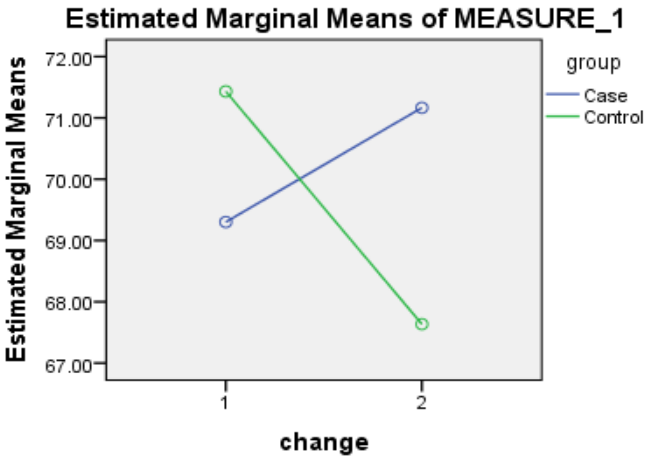


Harvard step test was conducted before and after the trial for assessing the cardiac efficiency of the study participants of both the groups. While comparing the means it was observed that in case group there was a slight increase in efficiency and a decrease was observed in the control group suggesting that there was decline in the efficiency of heart. The changes within the group and in between the 2 groups were statistically found to be very highly significant.

Chart 1

Tabulation of study participants based on Harvard step test

Profile Plots



Rasa dhatu Karma

Table 6. 52

Assessment of *lakshana's* of *rasa dhatu karma*

Sl.no	***Lakshana***	**Case**				**X^2**	**Remarks**	**Control**				**X^2**	**Remarks**
		BT		**AT**				**BT**		**AT**			
		P	**A**	**P**	**A**			**P**	**A**	**P**	**A**		
1.	Tushti	44	6	50	0	.012	Highly significant	39	11	39	11	1.000	Not significant
2.	Preenana	44	6	50	0	.012	Highly significant	46	4	46	4	1.000	Not significant
3.	Raktapushti	42	8	50	0	.003	Highly significant	43	7	43	7	1.000	Not significant

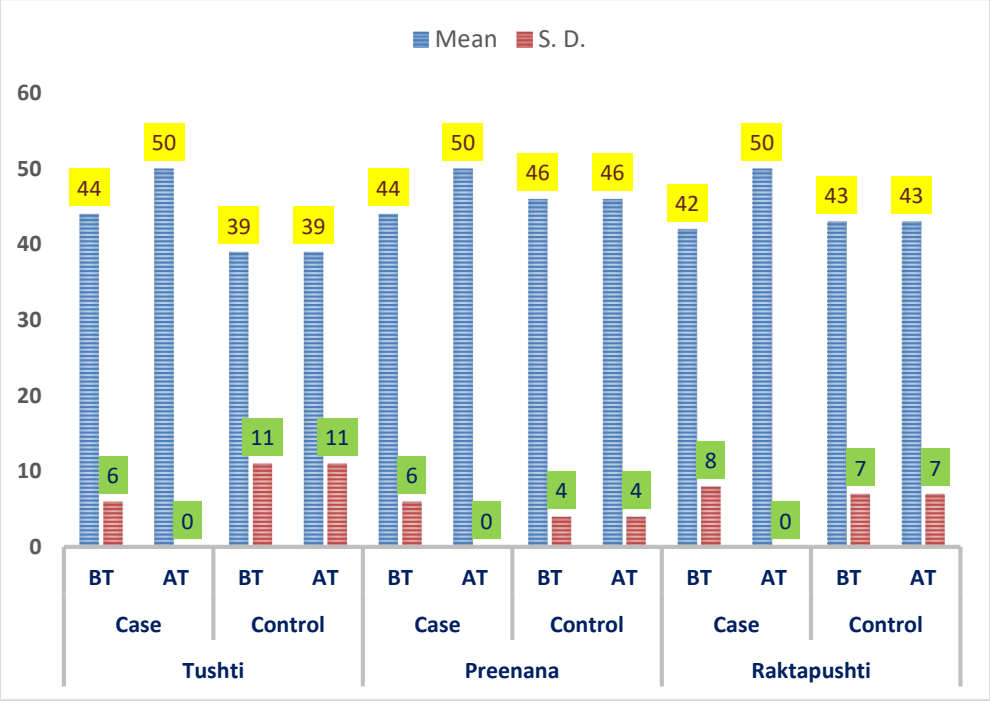
Tushti - Among 50 participants of the case group, 44 cases had tushti Before trial however, it got increased to 50 suggesting highly significant statistically, whereas control group did not show any changes before and after the treatment and hence was statistically not significant.

Preenana which is one among the *rasa dhatu* karma, in the case group 44 of them had this *lakshana* whereas after trial all the 50 participants had this clinical feature. This was found to be statistically highly significant. In the control group there was no change in this *lakshana* among the participants and hence was statistically not significant.

Raktapushti karma of rasa dhatu, in the case group 42 of them had this *lakshana* whereas after trial all the 50 participants had this clinical feature. This was found to be statistically highly significant. In the control group there was no change in this *lakshana* among the participants and hence was statistically not significant.

Graph 10

Assessment of *lakshana's* of *rasa dhatu karma*



Rasa dhatu vriddhi lakshanas

Table 6. 53

Assessment of *lakshana's* of *rasa dhatu vriddhi*

Sl.no	*Lakshana*	case				X^2	Remarks	control				X^2	Remarks
		BT		AT				BT		AT			
		P	A	P	A			P	A	P	A		
1.	Agnisada	11	39	0	50	.000	Highly significant	13	37	11	39	.640	Not significant
2.	Praseka	8	42	0	50	.003	Highly significant	11	39	11	39	1.000	Not significant
3.	Alasya	18	32	2	48	.000	Highly significant	23	27	19	31	.418	Not significant
4.	Gourava	13	37	0	50	.000	Highly significant	14	36	14	36	1.000	Not significant
5.	Shwaitya	2	48	0	50	.153	Not significant	4	46	4	46	1.000	Not significant
6.	Shaitya	2	48	0	50	.153	Not significant	5	45	5	45	1.000	Not significant
7.	Anga shaithilya	7	43	0	50	.006	Highly significant	9	41	11	39	.617	Not significant
8.	Shwasa	5	45	3	47	.461	Not significant	2	48	2	48	1.000	Not significant

9.	Kasa	4	46	3	47	.695	Not significant	3	47	6	44	.295	Not significant
10.	Atinidra	8	42	6	44	.564	Not significant	18	32	14	36	.391	Not significant

*Rasa dhatu vriddhi lakshana*s were assessed before and after the study. The outcomes are as follows.

Agnisada which means reduction in the capacity of digestive fire was noticed in 11 participants of the case group before study trial and after the study this *lakshana* was absent in all the participants of case group. This was statistically found to be very highly significant. In the control group, 13 participants had this *lakshana* before trial and 11 of them had after trial. So it was not found to be statistically significant.

Praseka In the control group praseka *lakshana* was found in 11 participants both before and after trial. So it was statistically not significant. Among the participants of the case group 8 of them had this *lakshana* before the trial and after trial none of them had this clinical feature. So this was statistically found to be highly significant.

Alasya was found in 18 participants among the 50 in the case group and it reduced to 2 persons after the trial. This was found to be statistically highly significant. Whereas in the control group there was reduction from 23 persons having this *lakshana* before trial to 19 persons with this *lakshana* after trial. This was not significant when analyzed statistically.

Gourava 13 participants in the case group was found to have this *lakshana* before trial and after trial none of them had this *lakshana*. This was found to be statistically very highly significant. In the control group 14 of them had this *lakshana* and there was no change in this after the trial also. This was statistically not significant.

Shwaitya was found in 2 persons among the case group before trial and after trial it was observed that no participants of this group had this *lakshana*. This was statistically not significant. In the control group, 4 of them had this *lakshana* both before and after the trial. This was also not significant when analyzed statistically.

Shaitya which means coldness was present in 2 cases among the case group and after trial none of them had this *lakshana*. It was not significant statistically. Among the control group 5 of them had this *lakshana* before and after the trial. This was not significant statistically when analysed.

Anga shaithilya was found in 7 persons who belonged to the case group before trial and none of them had this *lakshana* after trial. This was found to be highly significant. Amongst the control group 9 of them had this *lakshana* before trial and 11 of them had after trial. This was not found to be statistically significant.

Shwasa as a *lakshana* was found in 5 persons among the case group before trial and after trial 3 of them had this *lakshana*. It was not found to be statistically significant. In the control group, 2 of them had this *lakshana* both before and after trial and this were also found to be statistically not significant.

Kasa (cough) was found to be present in 4 of the persons in the trial group before trial and after trial 3 of them had this *lakshana*. This was not significant statistically. Amongst the control group 3 of them had this *lakshana* and after trial 6 of them had this *lakshana*. This was also not significant statistically.

Atinidra (excessive sleep) *lakshana* was found in 8 persons before trial and after trial 6 of them had after trial. This was statistically not significant. Amongst the 18 persons who belonged to the control group before trial 14 of them had after trial. This was also found to be not significant.

Rasa kshaya lakshanas

Table 6. 54

Assessment of *lakshana's* of *rasa dhatu kshaya*

Sl.no	***Lakshana***	**case**				**X^2**	**Remarks**	**control**				**X^2**	**Remarks**
		BT		**AT**				**BT**		**AT**			
		P	**A**	**P**	**A**			**P**	**A**	**P**	**A**		
1.	Roukshya	12	38	2	48	.004	Highly significant	23	27	22	28	.841	Not significant
2.	Shrama	27	23	5	45	.000	Highly significant	14	36	15	35	.826	Not significant
3.	Shosha	10	40	0	50	.001	Highly significant	5	45	5	45	1.000	Not significant
4.	Glani	10	40	0	50	.001	Highly significant	17	33	21	29	.410	Not significant
5.	Shabda asahishnuta	5	45	0	50	.022	Significant	18	32	22	28	.414	Not significant

Rasa kshaya (depletion) *lakshana*s were assessed before and after trial in both the case group and control group participants. The outcome is as follows.

Rouksya - In the control group rouksya *lakshana* was found in 23 participants before trial and 22 of them had this *lakshana* after trial. So it was statistically not significant. Among the participants of the case group 12 of them had this *lakshana* before the trial and after trial 2 of them had this clinical feature. So this was statistically found to be highly significant.

Shrama - Among 50 participants of the case group, 27 cases had shrama Before trial however, it got reduced to 5 suggesting highly significant statistically, whereas in the control group 14 of them had shrama before trial and 15 of them had after trial and hence was statistically not significant.

Shosha which means depletion was noticed in 10 participants of the case group before study trial and after the study this *lakshana* was absent in all the participants of case group. This was statistically found to be very highly significant. In the control group, 5 participants had this *lakshana* before & after trial. So it was not found to be statistically significant.

Glani was found in 10 participants among the 50 in the case group and it reduced to 0 after the trial. This was found to be statistically highly significant. Whereas in the control group there was increase from 17 persons having this *lakshana* before trial to 21persons with this *lakshana* after trial. This was not significant when analyzed statistically.

Shabdaasahishnuta - Among 50 participants of the case group, 5 cases had shabda asahishnuta before trial however, it got decreased to 0 suggesting significant results statistically, whereas in the control group 18 of them had this *lakshana* before trial and 22 of them had this after trial and hence was statistically not significant.

Twak sara *lakshana*

Table 6. 55

Assessment of *lakshana's* of *twak sarata*

Sl.no	*Lakshana*	case				X^2	Remarks	control				X^2	Remarks
		BT		AT				BT		AT			
		P	A	P	A			P	A	P	A		
1.	Snigdha	30	20	46	4	.000	Highly significant	27	23	27	23	1.000	Not significant
2.	Shlakshna	26	24	39	11	.000	Highly significant	21	29	24	26	.414	Not significant
3.	Mridu	43	7	48	2	.081	Not significant	44	6	41	9	.401	Not significant
4.	Prasanna	31	19	48	2	.000	Highly significant	43	7	43	7	1.000	Not significant
5.	Sukshma	23	27	26	24	.548	Not significant	31	19	31	19	1.000	Not significant
6.	Alpa	12	38	15	35	.499	Not significant	28	22	26	24	.688	Not significant
7.	Gambheera	22	28	24	26	.688	Not significant	33	17	31	19	.677	Not significant
8.	Sukumara loma	30	20	35	15	.295	Not significant	34	16	32	18	.673	Not significant
9.	Prabha	27	23	44	6	.000	Highly significant	39	11	36	14	.488	Not significant

Snigdha - As the shuddhamsha of *rasa dhatu* is seen in the colour, complexion, of skin, twak sara *lakshana* was assessed among the study participants to know whether the *rasa dhatu* formed is of a good kwality.

Snigdha *lakshana* was found in 30 participants among the 50 persons in the case group and it increased to 46 persons after the trial. This was found to be statistically highly significant. Whereas in the control group there was 27 persons having this *lakshana* before trial & after trial. This was not significant when analyzed statistically.

Shlakshna - 26 participants in the case group was found to have this *lakshana* before trial and after trial 39 of them had this *lakshana*. This was found to be statistically very highly significant. In the control group 21 of them had this *lakshana* and after trial it increased to 24 also. This was statistically not significant.

Mridu which means softness was noticed in 43 participants of the case group before study trial and after the study this *lakshana* was seen in 48 participants of case group. This was statistically found to be not significant. In the control group, 44 participants had this *lakshana* before trial and 41 of them had after trial. So it was not found to be statistically significant.

Prasanna *lakshana* was found in 31 participants among the 50 in the case group and it increased to 48 persons after the trial. This was found to be statistically highly significant. Whereas in the control group there was reduction from 23 persons having this *lakshana* before trial to 19 persons with this *lakshana* after trial. This was not significant when analyzed statistically.

Sukshma - 23 participants in the case group was found to have this *lakshana* before trial and after trial 26 of them had this *lakshana*. This was found to be statistically not significant. In the control group 31 of them had this *lakshana* and there was no change in this after the trial also. This was statistically not significant.

Alpa - Among 50 participants of the case group, 12 cases had alpa roma Before trial however, it got increased to 15 persons. This was statistically not significant. In the control group 28 of them had this *lakshana* before trial and after trial 26 of them had this *lakshana*. This was statistically not significant.

Gambheera - In the control group Gambheera romata was found in 33 participants before trial and after trial 31 of them had this *lakshana*. So it was statistically not significant. Among the participants of the case group 22 of them had this *lakshana* before the trial and after trial 24 of them had this clinical feature. So this was also statistically found to be not significant.

Sukumaraloma which means softness in the body hairs was noticed in 30 participants of the case group before study trial and after the study this *lakshana* was present in 35 participants of case group. This was statistically found to be not significant. In the control group, 34 participants had this *lakshana* before trial and 32 of them had after trial. So it was not found to be statistically not significant.

Prabha was found in 27 participants among the 50 in the case group and it increased to 44 persons after the trial. This was found to be statistically highly significant. Whereas in the control group there was reduction from 39 persons having this *lakshana* before trial to 36 persons with this *lakshana* after trial. This was not significant when analyzed statistically.

Rasa pradoshaja vikara

Table 6. 56

Assessment of *lakshana's* of *rasa pradoshaja vikara*

		Case						Control					
Sl.no	***Lakshana***	**BT**		**AT**		**X^2**	**Remarks**	**BT**		**AT**		**X^2**	**Remarks**
		P	**A**	**P**	**A**			**P**	**A**	**P**	**A**		
1.	Ashraddha	8	42	0	50	.003	Highly significant	7	43	7	43	1.000	Not significant
2.	Aruchi	5	45	0	50	.022	Significant	5	45	5	45	1.000	Not significant
3.	Aasya vairasya	2	48	2	48	1.000	Not significant	2	48	2	48	1.000	Not significant
4.	Arasagnata	0	50	0	50	-	-	1	49	1	49	1.000	Not significant
5.	Hrillasa	0	50	0	50	-	-	5	45	5	45	1.000	Not significant
6.	Gourava	8	42	0	50	.003	Highly significant	16	34	18	32	.673	Not significant
7.	Tandra	11	39	0	50	.000	Highly significant	14	36	16	34	.663	Not significant
8.	Angamarda	16	34	2	48	.000	Highly significant	15	35	17	33	.668	Not significant
9.	Tama	3	47	0	50	.079	Not significant	4	46	4	46	1.000	Not significant
10.	Pandutwa	2	48	0	50	.153	Not significant	8	42	8	42	1.000	Not significant

11.	Srotorodha	4	46	0	50	.041	Significant	2	48	2	48	1.000	Not significant
12.	Sada	7	43	2	48	.081	Not significant	0	50	0	50		
13.	Krishanga	10	40	10	40	1.000	Not significant	5	45	5	45	1.000	Not significant
14.	Agni nasha	7	43	0	50	.006	Highly significant	7	43	6	44	.766	Not significant
15.	Vali	9	41	5	45	.249	Not significant	10	40	10	40	1.000	Not significant
16.	Palita	18	32	16	34	.673	Not significant	25	25	25	25	1.000	Not significant

Ashraddha

Rasa pradoshaja vikara was assessed among the study participants before and after the study. Among 50 participants of the case group, 08 cases had ashraddha Before trial however, it got decreased to 0 suggesting significant statistically, whereas in the control group there were 7 persons with this *lakshana* and they did not show any changes before and after the treatment and hence was statistically not significant.

Aruchi - 05 participants in the case group was found to have aruchi before trial and after trial none of them had this *lakshana*. This was found to be statistically significant. In the control group 05 of them had this *lakshana* before trial and there was no change in this after the trial also. This was statistically not significant.

Aasyavairasya - In the control group asyavairasya *lakshana* was found in 2 participants both before and after trial. So it was statistically not significant. Among the participants of the case group 2 of them had this *lakshana* before and after trial. So this was statistically found to be not significant.

Arasagnata was found in none of the participants among the 50 in the case group and it is not able to analyze statistically as there is no presence of this *lakshana*. In the control group there was only 1 person having this *lakshana* before and after trial. This was not significant when analyzed statistically.

Hrillasa was found in none of the participants among the 50 in the case group and it is not able to analyse statsisically as there is no presence of this *lakshana*. In the control group there were only 5 persons having this *lakshana* before and after trial. This was not significant when analyzed statistically

Gourava as in pradoshaja vikara - In the control group gourava *lakshana* was found in 16 participants before and in 18 participants after trial. So it was statistically not significant. Among the participants of the case group 8 of them had this *lakshana* before the trial and after trial none of them had this clinical feature. So this was statistically found to be highly significant.

Tandra - Among 50 participants of the case group, 11 cases had tandra Before trial however, it got decreased to 0 suggesting highly significant statistically, whereas

control group did not show any changes before and after the treatment and hence was statistically not significant.

Angamarda - 16 participants in the case group were found to have this *lakshana* before trial and after trial 2 of them had this *lakshana*. This was found to be statistically very highly significant. In the control group 15 of them had this *lakshana* before trial and after trial it increased to 17 participants having this *lakshana*. This was statistically not significant.

Jwara was not found in any participants before and after the trial in both the groups. Hence this *lakshana* cannot be analyzed statistically.

Tama was seen in 3 individuals among the case group before trial and after trial there were no cases with this *lakshana*. This was statistically not significant. In the control group 4 individuals had this *lakshana* both before and after the trial. This was also not significant statistically.

Pandutwa

In the control group padutwa *lakshana* was found in 08 participants both before and after trial. So it was statistically not significant. Among the participants of the case group 2 of them had this *lakshana* before the trial and after trial none of them had this clinical feature. So this was also statistically found to be not significant.

Srotorodha which means blockage in the internal channels of our body was noticed in 04 participants of the case group before study trial and after the study this *lakshana* was absent in all the participants of case group. This was statistically found to be significant. In the control group, 2 participants had this *lakshana* before trial and after trial. So it was not found to be statistically significant.

Klaibhya

This *lakshana* was absent in all the participants of the case group and control group. Hence this cannot be analyzed statistically.

Sada

Among 50 participants of the case group, 7 cases had *sada* (tieredness) before trial however, it got reduced to 2 participants which was statistically found to be not significant. In the control group none of the participants had this *lakshana* and hence cannot be analyzed statistically.

Krishanga

Krishanga (debilitated body parts) was seen in 10 individuals of the case group both before and after trial, whereas this *lakshana* was found in 5 individuals of control group. In both the groups statistically it was found to be not significant.

Agninasha

In the control group agninasha *lakshana* was found in 7 participants before trial and after trial it reduced to 6 individuals. . So it was statistically not significant. Among the participants of the case group 7 of them had this *lakshana* before the trial and after trial none of them had this clinical feature. So this was statistically found to be highly significant.

Vali

Vali which means wrinkling of skin was noticed in 9 participants of the case group before study trial and after the study this *lakshana* was seen in 5 participants of case group. This was statistically found to be not significant. In the control group, 10 participants had this *lakshana* before trial and after trial. So it was also not found to be statistically significant.

Palita - Among 50 participants of the case group, 18 cases had palita (graying of hair) before trial however, it got reduced to 16 and this was found to be statistically not significant. In the control group 25 participants had this *lakshana* and they did not show any changes before and after the trial and hence was statistically not significant.

LIPID PROFILE

In the study participants lipid profile was tested after collecting the fasting sample of 12 hours of fasting. The test was done before and after the trial and the outcomes are as follows.

Total Cholesterol

Table 6. 57

Tabulation of study participants based on Total Cholesterol value(descriptive statistics)

	Group	Mean	Std. Deviation	N
Cholesterol BT	Case	174.2400	16.83238	50
	Control	169.1600	24.88534	50
	Total	171.7000	21.28997	100
Cholesterol AT	Case	159.8400	12.85136	50
	Control	171.1400	23.89860	50
	Total	165.4900	19.91674	100

Table 6. 58

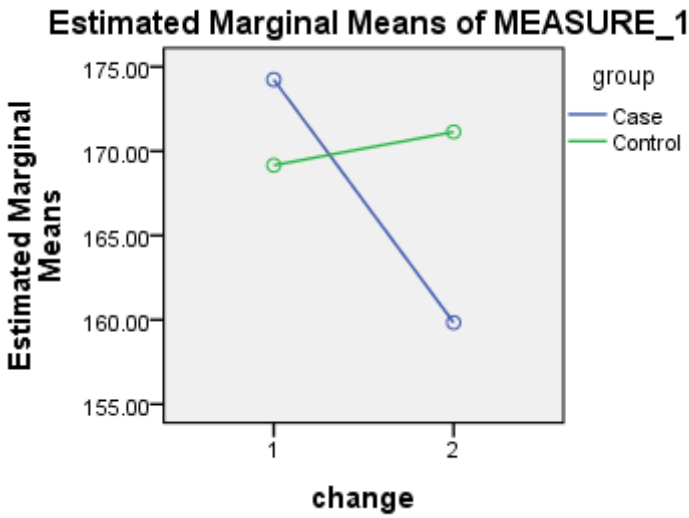
Tabulation of study participants based on Total Cholesterol value (inferential statistics)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Remarks
Change	1928.205	1	1928.205	17.866	.000	Highly significant
Change * group	3353.805	1	3353.805	31.076	.000	Highly significant

When both the means of before trial and after trial among the case group are compared there is a highly significant reduction seen in the total cholesterol level. When the means of before trial and after trial among the control group are compared there is an increase in the cholesterol level. When the change in between these groups and within the groups were measured using ANNOVA test it was found to be statistically very highly significant.

Chart 2

Tabulation of study participants based on Total Cholesterol value



Triglycerides

Table 6. 59

Tabulation of study participants based on Triglyceride value (descriptive statistics)

	Group	Mean	Std. Deviation	N
TG BT	Case	89.0400	31.58207	50
	Control	91.0600	28.03017	50
	Total	90.0500	29.72513	100

TG AT	Case	79.4800	22.04563	50
	Control	96.5000	31.70994	50
	Total	87.9900	28.48480	100

Table 6. 60

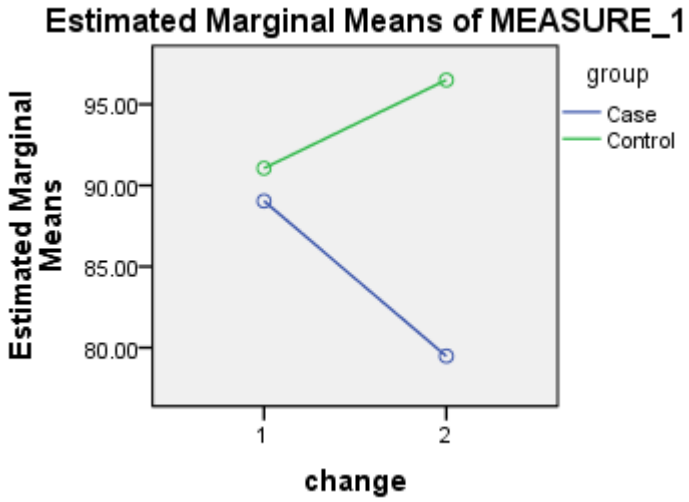
Tabulation of study participants based on Triglyceride value (inferential statistics)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Remarks
Change	212.180	1	212.180	1.585	.211	Not significant
Change * group	2812.500	1	2812.500	21.012	.000	Highly significant
Error(change)	13117.320	98	133.850			

When both the means of before trial and after trial among the case group are compared there is a highly significant reduction seen in the triglyceride level. When the means of before trial and after trial among the control group are compared there is an increase in the triglyceride level. The change in between these groups were measured using ANOVA test it was found to be statistically very highly significant. Whereas the change within the group was found to be not significant statistically.

Chart 3

Tabulation of study participants based on triglyceride value



HDL – High Density Lipoprotein

Table 6. 61

Tabulation of study participants based on HDL value (descriptive statistics)

	Group	Mean	Std. Deviation	N
HDL BT	Case	32.1800	3.17959	50
	Control	34.8600	5.98641	50
	Total	33.5200	4.95532	100
HDL AT	Case	34.4400	3.63745	50
	Control	33.4200	5.94564	50
	Total	33.9300	4.93033	100

Table 6. 62

Tabulation of study participants based on HDL value (inferential statistics)

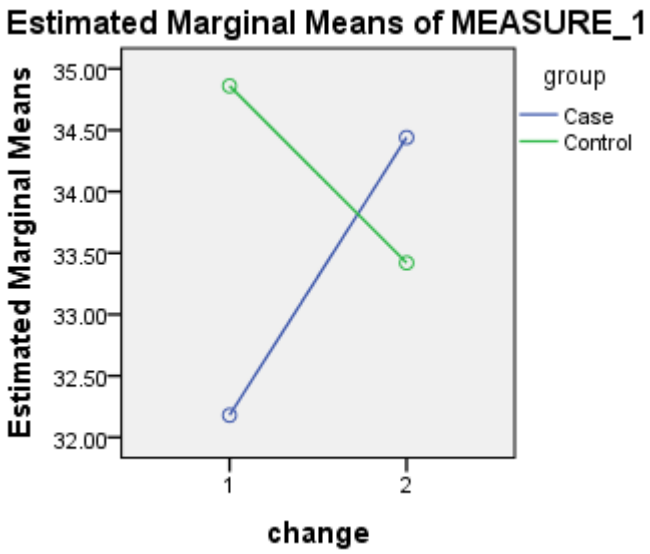
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Remarks

Change	8.405	1	8.405	1.929	.168	Not significant
Change * group	171.125	1	171.125	39.277	.000	Highly significant
Error(change)	426.970	98	4.357			

The means of before trial and after trial among the case group when compared showed an increase seen in the high density lipoprotein level. When the means of before trial and after trial of the control group were compared there was a reduction in the high density lipoprotein level. The change within the group was not significant and the change between the groups was found to be statistically highly significant.

Chart 4

Tabulation of study participants based on HDL value



LDL – LOW DENSITY LIPOPROTEIN

Table 6. 63

Tabulation of study participants based on LDL value (descriptive statistics)

	Group	Mean	Std. Deviation	N

LDL BT	Case	123.4400	13.81091	50
	Control	118.9800	19.33643	50
	Total	121.2100	16.86686	100
LDL AT	Case	111.8400	9.66872	50
	Control	120.3600	18.47531	50
	Total	116.1000	15.28219	100

Table 6. 64

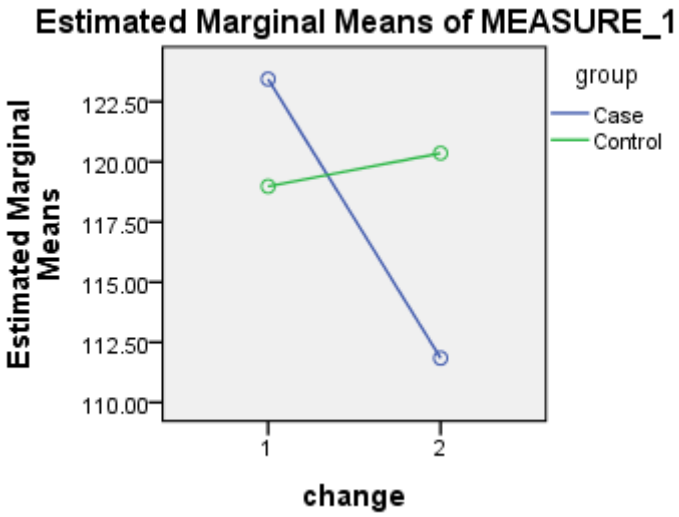
Tabulation of study participants based on LDL value (Inferential statistics)

Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**	**Remarks**
Change	1305.605	1	1305.605	19.384	.000	Highly significant
Change * group	2106.005	1	2106.005	31.267	.000	Highly significant
Error(change)	6600.890	98	67.356			

The means of before trial and after trial among the case group when compared showed a reduction in the low density lipoprotein level. When the means of before trial and after trial of the control group were compared there was an increase in the low density lipoprotein level. When the change in between these groups and within the groups were measured using ANNOVA test it was found to be statistically very highly significant

Chart 5

Tabulation of study participants based on LDL value



.

Very low density lipoprotein

Table 6.65

Tabulation of study participants based on VLDL value (descriptive statistics)

	Group	**Mean**	**Std. Deviation**	**N**
VLDL BT	Case	17.4200	6.46526	50
	Control	17.9000	5.50788	50
	Total	17.6600	5.98014	100
VLDL AT	Case	15.5400	4.45481	50
	Control	19.1600	6.55077	50
	Total	17.3500	5.86270	100

Table 6.66

Tabulation of study participants based on VLDL value (Inferential statistics)

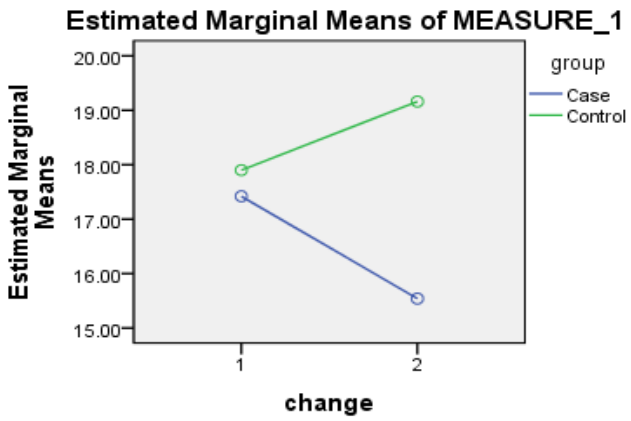
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**	**Remarks**

Change	Sphericity Assumed	4.805	1	4.805	.765	.384	Not significant
Change * group	Sphericity Assumed	123.245	1	123.245	19.625	.000	Highly significant
Error(change)	Sphericity Assumed	615.450	98	6.280			

The means of before trial and after trial among the case group when compared showed a reduction in the very low density lipoprotein level. When the means of before trial and after trial of the control group were compared there was an increase in the very low density lipoprotein level. The change within the group was not significant and the change between the groups was found to be statistically highly significant.

Chart 5

Tabulation of study participants based on VLDL value



OBSERVATION AND ANALYSIS OF ABHYAVAHARANA SHAKTI AND OTHER COMPONENTS OF AGNI PAREEKSHA.

In the present study the status of agni was analyzed before and after the trial. This would help in understanding the more the agni becomes better, the quality of *rasa dhatu* formed will also be good. And also whether the study was effective or not to know this the following *lakshana*s were analyzed before trial, after trial and at the end

of 1 month to know the sustenance of results. Here the outcomes are enlisted as follows.

Abhyavaharanashakti

Table 6. 67

Assessment of *Abhyavaharana Shakti* of study participants

			Pravara	**Madhyama**	**Avara**	**Total**	**Pearson Chi-Square**	**Remarks**
Case	Abhyavaharana shakti	BT	5	37	8	50	.001	Highly significant
		AT	20	28	2	50		
	Total		25	65	10	100		
Control	Abhyavaharana shakti	BT	9	39	2	50	.698	Not significant
		AT	9	37	4	50		
	Total		18	76	6	100		

The status of *abhyavaharana shakti* (food intake capacity) was checked whether it was *pravara, madhyama or avara*. 5 individuals in the case group had *pravara* abhyavaharana shakti before trial which got increased to 20 individuals after the trial. 37 participants had *madhyama abhyavaharana shakti* which after trial was seen in 28 individulas. *Avara abhyavaharana shakti* was seen in 8 individuals before trial and after trial it was seen in only 2 participants. This was statistically found to be very highly significant.

In the control group, 9 of them had *pravara abhyavaharana shakti* before & after trial, 39 of them had *madhyama abhyavaharana shakti* before trial 37 of them had after trial, and 2 of them had *Avara abhyavaharana shakti* before trial which was seen in 4 participants after trial. This was statistically not significant.

Table 6. 68

Assessment of changes in *Abhyavaharana Shakti* of study participants

		Case	Control	Total	Pearson Chi-Square	Remarks
Abhyavaharana shakti	same	4	50	54	.000	Highly significant
	Improved	46	0	46		
Total		50	50	100		

To know the sustenance of the results when analyzed before, after and at the end of 1 month, it was observed that 4 individuals had the same status of *abhyavaharana shakti* after trial also, whereas 46 participants showed improvement in the case group. In the control group all the participants had same status of *abhyavaharana shakti* after trial also with no any reduction in its status. So this was statistically very highly significant.

Jeerna *lakshana*s

Jeerna lakshanas of *ahara* were assessed before and after the study. Following were the outcomes

Table 6. 69

Assessment of *Jeerna Ahara lakshanas* of study participants

Sl.no	*Lakshana*	Case						Control					
		BT		AT		X^2	Remarks	BT		AT		X^2	Remarks
		P	A	P	A			P	A	P	A		
1.	Udgara shuddhi	43	7	50	0	.006	Highly significant	48	2	46	4	.400	Not significant
2.	Utsaha	44	6	50	0	.012	Highly significant	47	3	45	5	.461	Not significant
3.	Malotsarjana	46	4	46	4	1.000	Not significant	48	2	48	2	1.000	Not significant
4.	Mutrotsarjana	46	4	48	2	.360	Not significant	50		50			
5.	Laghuta	42	8	50	0	.003	Highly significant	34	16	32	18	.673	Not significant
6.	Developing hunger	46	4	50	0	.041	Significant	48	2	46	4	.400	Not significant
7.	Developing thirst	48	2	48	2	1.000	Not significant	46	4	46	4	1.000	Not significant

Table 6. 70

Assessment of changes in *Jeerna Ahara lakshanas* of study participants

Sl.no	*Lakshana*	Group	Same	Reduced	Improved	X^2	Remarks
1.	Udgara shuddhi	Case	2	2	46	.000	Highly significant
		Control	50	0	0		
2.	Utsaha	Case	0	-	50	.000	Highly significant
		Control	50	-	0		
3.	Malotsarjana	Case	21	-	29	.000	Highly significant
		Control	50	-	0		
4.	Mutrotsarjana	Case	24	-	26	.000	Highly significant
		Control	50	-	0		
5.	Laghuta	Case	3	-	47	.000	Highly significant
		Control	50	-	0		
6.	Developing hunger	Case	2	-	48	.000	Highly significant
		Control	50	-	0		
7.	Developing thirst	Case	6	-	44	.000	Highly significant
		Control	50	-	0		

UdgaraShuddhi

Udgara shuddhi (clear belching which is a sign of good digestion) was seen in 43 individuals in the case group who showed presence of this *lakshana* before trial which got increased to50 individuals after the trial. 7 participants had absence of *udgara shuddhi* which after trial was seen in none of the participants. This was statistically found to be very highly significant.

In the control group, 48 of them had presence of *udgara shuddhi* before & 46 of them had after trial, 2 of them had absence of *udgara shuddhi* before trial and after trial 4 of the participants had absence of this *lakshana*. This was statistically not significant.

It was observed that 2 individuals had the same status of *udgara shuddhi* after trial, 2 individuals had reduced status of udgara shuddhi, whereas 46 participaants showed improvement in the case group. In the control group all the participants had same status of *udgara shuddhi* after trial also with no any reduction in its status. So this was statistically very highly significant.

Utsaha

Utsaha (enthusiasm to work) was seen in 43 individuals in the case group before trial which got increased to50 individuals after the trial. 6 participants had absence of utsaha which after trial was seen in none of the participants. This was statistically found to be very highly significant.

In the control group, 47 of them had presence of utsaha before & 45 of them had after trial, 3 of them had absence of utsaha before trial and after trial 5 of the participants had absence of this *lakshana*. This was statistically not significant.

It was observed that all the participants showed improved staus of utsaha in the case group. In the control group all the participants had same status of utsaha after trial also with no any reduction in its status. So this was statistically very highly significant.

Malotsarjana

Malotsarjana (defeacation with ease) was present in 46 individuals in the case group before trial and after the trial. 4 participants had absence of this *lakshana* both before and after the trial in the case group. This was statistically not significant.

In the control group, 48 of them had presence of this *lakshana* before & after trial, 2 of them had absence of malotsarjana before trial and after trial. This was statistically not significant.

Malotsarjana with ease was seen as status co in 21 among the case group individuals and was seen improved in 29 of them. This was statistically highly significant. Among the control group participants, the same status remained after trial also.

Mutrotsarjana

Mutrotsarjana (passage of urine with ease) was present in 46 persons of the case group before trial and 48 of them after trial. 2 of them had absence of this *lakshana* before and after trial in the case group. This was statistically not significant. 50 individuals among the control group had presence of this *lakshana* both before and after trial. So this cannot be analyzed statistically.

Mutrotsarjana with ease was seen as same in 24 among the case group individuals and was seen improved in 26 of them. This was statistically very highly significant. Among the control group participants, the same status remained after trial also.

Laghuta

Laghuta (lightness of the body) was seen in 42 individuals in the case group before trial which got increased to50 individuals after the trial. 8 participants had absence of laghuta which after trial was seen in none of the participants. This was statistically found to be very highly significant.

In the control group,34 of them had presence of laghuta before & 32 of them had after trial, 16 of them had absence of laghuta before trial and after trial 18 of the participants had absence of this *lakshana*. This was statistically not significant.

It was observed that 47 participants showed improved status of laghuta and 3 others maintained the same status in the case group. In the control group all the participants had same status of laghuta after trial also with no any reduction in its status. So this was statistically very highly significant.

Developing Hunger

Development of hunger was seen in 46 individuals in the case group before trial which got increased to50 individuals after the trial. 4 participants had absence of this

lakshana which after trial was seen in none of the participants. This was statistically found to be significant.

In the control group, 48 of them had presence of development of hunger before & 46 of them had after trial, 2 of them had absence of this *lakshana* before trial and after trial 4 of the participants had absence of this *lakshana*. This was statistically not significant.

It was observed that almost all the participants showed improved status of development of hunger in the case group. In the control group all the participants had same status of development of hunger after trial also with no any reduction in its status. So this was statistically very highly significant.

Developing Thirst

Development of thirst was seen in 48 individuals in the case group before and after trial. 2 participants had absence of this *lakshana* before and after trial. This was statistically found to be not significant.

In the control group, 46 of them had presence of development of thirst before & after trial, 4 of them had absence of this *lakshana* before trial and after trial. This was statistically not significant.

It was observed that in 44 participants showed improved status of development of thirst in the case group. In the control group all the participants had same status of development of hunger after trial also with no any reduction in its status. So this was statistically very highly significant.

Benefits of snigdhabhojana

Benefits of snigdhabhojana were assessed before and after the study. Following were the outcomes

Table 6. 71

Assessment of benefits of *snigdha bhojana* of study participants

		Case						Control					
Sl.no	***Lakshana***	**BT**		**AT**		**X^2**	**Remarks**	**BT**		**AT**		**X^2**	**Remarks**
		P	**A**	**P**	**A**			**P**	**A**	**P**	**A**		
1.	Bhujyamanam swadate	46	4	50	0	.041	Significant	48	2	48	2	1.000	Not significant
2.	Agni udeerana	46	4	50	0	.041	Significant	44	6	44	6	1.000	Not significant
3.	Kshipra jara	23	27	44	6	.000	Highly significant	26	24	24	26	.689	Not significant
4.	Vatanulomana	44	6	50	0	.012	Highly significant	42	8	42	8	1.000	Not significant
5.	Shareera upachaya	42	8	50	0	.003	Highly significant	43	7	43	7	1.000	Not significant
6.	Indriya dardhya	44	6	50	0	.012	Highly significant	41	9	43	7	.585	Not significant
7.	Increases bala	34	16	50	0	.000	Highly significant	41	9	41	9	1.000	Not significant
8.	Increases varna	36	14	50	0	.000	Highly significant	41	9	41	9	1.000	Not significant

Table 6. 72

Assessment of changes seen in benefits of *snigdha bhojana* of study participants

Sl.no	*Lakshana*	Group	Same	Reduced	Improved	X^2	Remarks
1.	Bhujyamanam swadate	Case	6		44	.000	Highly significant
		Control	50		0		
2.	Agni udeerana	Case	4		46	.000	Highly significant
		Control	50		0		
3.	Kshipra jara	Case	8	0	42	.000	Highly significant
		Control	47	3	0		
4.	Vatanulomana	Case	1		49	.000	Highly significant
		Control	50		0		
5.	Shareera upachaya	Case	6	2	42	.000	Highly significant
		Control	50	0	0		
6.	Indriya dardhya	Case	9		41	.000	Highly significant
		Control	50		0		
7.	Increases bala	Case	0		50	.000	Highly significant
		Control	50		0		
8.	Increases varna	Case	7	0	43	.000	Highly significant
		Control	49	1	0		

Bhujyamaanam Swadate means persons feel the taste of the food after ingestion of the food item. This is considered as one among the benefits of *snigdha bhojana*. In the case group before trial 46 participants had this *lakshana* and after trial all of them had the presence of this *lakshana*. 4 of them had absence of this *lakshana* before trial and after trial none of them had absence of this *lakshana*. This was found to be significant statistically. In the control group 48 of them had presence of this *lakshana* and 2 of

them had absence of this *lakshana* before and after trial. This was not significant statistically.

In the case group 44 of them had improved status of getting the taste after ingestion of food whereas in 6 of them it remained the same. In the control group in all the participants the status remained same with no improvement. This was statistically very highly significant.

Agni Udeerana which means instigation or steering up the strength of the digestive fire after taking *snigdha bhojana* was found to be present in 46 participants and after trial was seen in all 50 participants. It was absent in 4 persons before trial and after trial was seen in none of them. This was statistically significant. In the control group 44 of them had the presence of this *lakshana* & 6 of them had absence of this *lakshana* both before and after trial. This was not significant statistically.

Agni udeerana seemed to improve in 46 persons of the case group and remained same in all the participants of the control group. This was statistically found to be very highly significant.

Kshipra Jara means food undergoing quick digestion. This is considered as one among the benefits of *snigdha bhojana*. In the case group before trial 23 participants had this *lakshana* and after trial 44 of them had the presence of this *lakshana*. 27 of them had absence of this *lakshana* before trial and after trial 6 of them had absence of this *lakshana*.This was found to be highly significant statistically. In the control group 26 of them had presence of this *lakshana* before trial and after trial 24 of them had presence of this *lakshana*. Whereas 24 of them had absence of this *lakshana* before trial and 26 of them had absence of this *lakshana* after trial. This was statistically not significant.

In the case group 42 of them had improved status of quick digestion of food whereas in 8 of them it remained the same. In the control group in 47 participants the status remained same with no improvement in any one of them and was seen reduced in 3 individuals. . This was statistically very highly significant.

Vatanulomana which means passage of adhovata (flatus) easily after taking *snigdha bhojana* was found to be present in 44 participants and after trial was seen in all 50

participants. It was absent in 6 persons before trial and after trial was seen to be absent in none of them. This was highly significant statistically. In the control group 42 of them had the presence of this *lakshana* & 8 of them had absence of this *lakshana* both before and after trial. This was not significant statistically

Vatanulomana seemed to improve in 49 persons of the case group and remained same in all the participants of the control group. This was statistically found to be very highly significant.

Shariropachaya means nourishment of the body. This is considered as one among the benefits of *snigdha bhojana*. In the case group before trial 42 participants had this *lakshana* and after trial all of them had the presence of this *lakshana*. 8 of them had absence of this *lakshana* before trial and after trial none of them had absence of this *lakshana*. This was found to be highly significant statistically. In the control group 43 of them had presence of this *lakshana* and 7 of them had absence of this *lakshana* before and after trial. This was not significant statistically.

In the case group 42 of them had improved status of nourishment of the body whereas in 6 of them it remained the same. In 2 of them it was found to be reduced. In the control group in all the participants the status remained same with no improvement. This was statistically very highly significant.

IndriyaDhardhya means strength of both *gnanendriya* and *karmendriya*, the sense organs and the organs of action after taking *snigdha bhojana* was found to be present in 44 participants before trial and after trial was seen in all 50 participants. It was absent in 6 persons before trial and after trial was absent in none of them. This was found to be significant statistically. In the control group 41 of them had the presence of this *lakshana* before trial 43 of them after trial & 9 of them had absence of this *lakshana* before and after trial absence of this *lakshana* was seen in 7 individuals. This was not significant statistically.

Indriya Dhardhya seemed to improve in 41 persons of the case group and remained same in all the participants of the control group. This was statistically found to be very highly significant.

Bala means person's strength. This is considered as one among the benefits of *snigdha bhojana*. In the case group before trial 34 participants had this *lakshana* and after trial all of them had the presence of this *lakshana*. 16 of them had absence of this *lakshana* before trial and after trial none of them had this *lakshana*. This was found to be significant statistically. In the control group 41 of them had presence of this *lakshana* and 9 of them had absence of this *lakshana* before and after trial.

In the case group all of them had improved *bala*. In the control group in all the participants the status remained same with no improvement. This was statistically very highly significant.

Varna which means increase in the complexion after taking *snigdha bhojana* was found to be present in 36 participants and after trial was seen in all 50 participants. It was absent in 14 persons before trial and after trial was seen in none of them. In the control group 41 of them had the presence of this *lakshana* & 9 of them had absence of this *lakshana* both before and after trial.

Varna or complexion and color seemed to improve in 43 persons and remained same in 7 of the case group. In the participants of the control group 49 of them had the same status in 1 person the status reduced and in none of them improvement is seen. This was statistically found to be very highly significant.

Observations of WHO questionnaire for evaluating the quality of life.

In order to analyze the tushti (mental satisfaction) which is *rasa dhatu* karma, WHO questionnaire was used to assess the quality of life scale which gives a direct link for mental satisfaction and happiness. The questions in the questionnaire covered all aspects of life which is related to the health, personal life, professional life, social environments etc. Based on all these questions which were given scorings they have been classified into 4 domains and the data was subjected to statistical analysis and the outcome is as follows.

Domain 01

Table 6. 74

Tabulation of results of Domain 01 in study participants (descriptive statistics)

	Group	Mean	Std. Deviation	N
Domain 1 BT	Case	41.6000	6.63017	50
	Control	42.4634	6.66745	41
	Total	41.9890	6.62402	91
Domain 1 AT	Case	48.0400	6.98675	50
	Control	42.2927	6.87111	41
	Total	45.4505	7.47182	91

Table 6. 75

Tabulation of results of Domain 01 in study participants (inferential statistics)

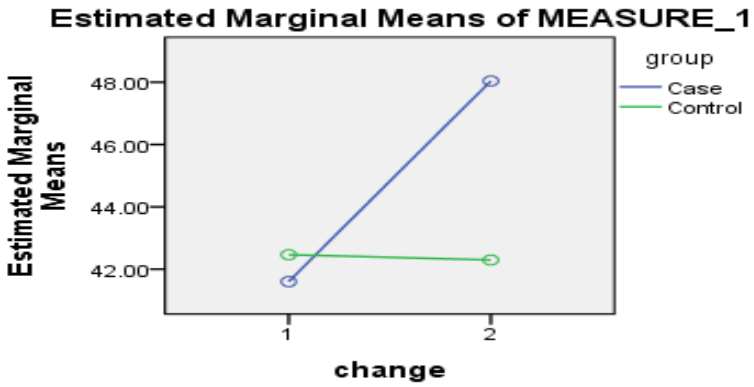
Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Change	Sphericity Assumed	442.707	1	442.707	34.023	.000
Change * group	Sphericity Assumed	492.245	1	492.245	37.830	.000
Error(change)	Sphericity Assumed	1158.062	89	13.012		

In the 1st domain the means of both the group when compared we can see an increase in the means of the case group after trial compared to before trial. In the control group there was no difference in the means. The changes within the group and in between the group were statistically found to be highly significant.

Profile Plots

Chart 6

Tabulation of results of Domain 01 in study participants



Domain 2

Table 6. 76

Tabulation of results of Domain 02 in study participants (descriptive statistics)

	Group	**Mean**	**Std. Deviation**	**N**
Domain 2 BT	Case	59.5400	10.85190	50
	Control	62.0000	9.88939	41
	Total	60.6484	10.44496	91
Domain 2 AT	Case	67.0200	9.34921	50
	Control	62.1951	9.13296	41
	Total	64.8462	9.51247	91

Table 6. 77

Tabulation of results of Domain 02 in study participants (inferential statistics)

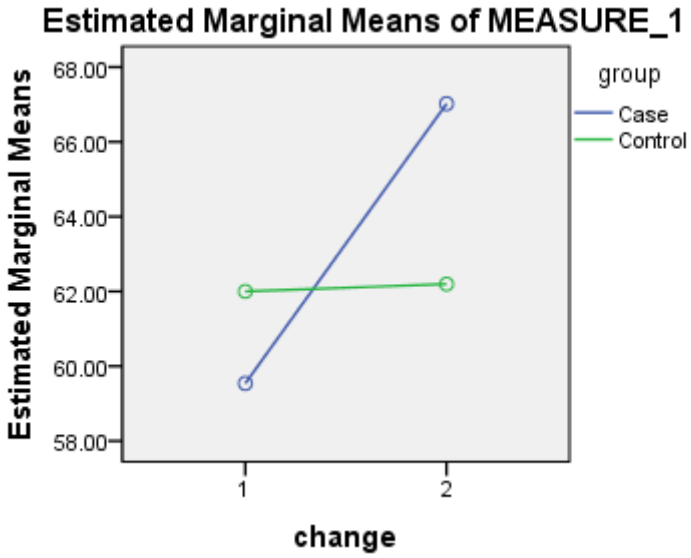
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Change	663.519	1	663.519	32.367	.000
Change * group	597.760	1	597.760	29.160	.000
Error(change)	1824.460	89	20.500		

In the 2nd domain the means of both the group when compared we can see an increase in the means of the case group after trial when compared to before trial. In the control group there was no difference in the means. The changes within the group and in between the group were statistically found to be very highly significant.

Profile Plots

Chart 7

Tabulation of results of Domain 02 in study participants



Domain 03

Table 6. 78

Tabulation of results of Domain 03 in study participants (descriptive statistics)

	Group	**Mean**	**Std. Deviation**	**N**
Domain 3 BT	Case	70.0000	10.29761	50
	Control	71.8293	11.05419	41
	Total	70.8242	10.62449	91
Domain 3 AT	Case	76.5200	13.60558	50
	Control	71.9512	11.48902	41
	Total	74.4615	12.83252	91

Table 6. 79

Tabulation of results of Domain 03 in study participants (inferential statistics)

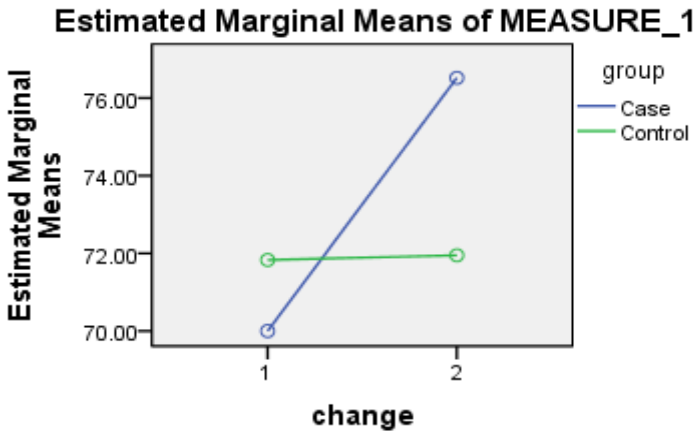
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Change	496.906	1	496.906	21.422	.000
Change * group	461.081	1	461.081	19.878	.000
Error(change)	2064.435	89	23.196		

In the 3rd domain the means of both the group when compared we can see an increase in the means of the case group after trial when compared to before trial. In the control group there was no difference in the means. The changes within the group and in between the group were statistically found to be very highly significant.

Profile Plots

Chart 8

Tabulation of results of Domain 03 in study participants



Domain 04

Table 6.80

Tabulation of results of Domain 04 in study participants (descriptive statistics)

	Group	Mean	Std. Deviation	N
Domain 4 BT	Case	69.5000	10.34161	50
	Control	72.8537	8.84466	41
	Total	71.0110	9.78831	91
Domain 4 AT	Case	75.3800	12.29217	50
	Control	73.0488	9.70039	41
	Total	74.3297	11.20025	91

Table 6.81

Tabulation of results of Domain 04 in study participants (inferential statistics)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.

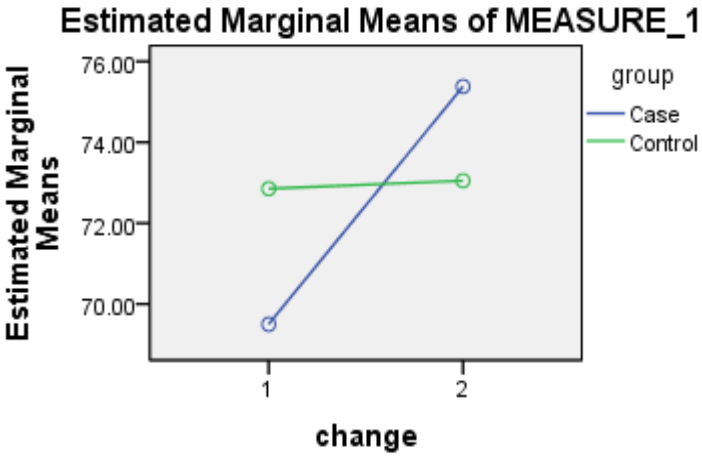
Change	415.712	1	415.712	32.630	.000
Change * group	364.020	1	364.020	28.573	.000
Error(change)	1133.860	89	12.740		

In the 4th domain the means of both the group when compared we can see an increase in the means of the case group after trial compared to before trial. In the control group also a slight increase was noted in the means. The changes within the group and in between the group was statistically found to be highly significant.

Profile Plots

Chart 9

Tabulation of results of Domain 04 in study participants



DISCUSSION

This segment of the current study deals with discussing the points of importance/significance under 3 main headings.

I. Discussion on literature review
II. Discussion on methodology
III. Discussion on observation and results.

Discussion on literature review

Chapter on *sneha*

The etymology of the word *sneha*, is that which brings in lubrication. *Snigdha* is a resultant *guna* of *sneha dravya*, it brings about *kledana*, though the qualities of *ghrita* will be discussed in detail in the next chapter, the general or *samanya gunas* of *sneha* such as *snigdha, mridu, shlakshna* etc are discussed here.

Sneha has the property of mitigating *vata*, softens the body parts and breaks the accumulation of *malas* in the body by creating *mridutwa* in them too [219] (*sneho anilam hanti, mridu karoti deham, malanaam vinihanti sangam*)

The aim of *snehana karma* is to promote the *snigdha guna* in the body. It brings in *shlakshnata* and *mriduta* in all the *dhatus* and also in the *doshas* which are *leena* within them.

Among the 4 *sneha's - ghrita, taila, vasa and majja*, three of them are from animal source. Only *taila* is derived from plant source. *Vasa* is considered as the *sneha* of *mamsa*. [220] (*shuddha mamsa bhava sneha saa vasa parikeertita*). So *vasa* contains more *sadhrmya amsha* of *mamsa*. *Majja* though a type of *sneha*, it is itself a *dhatu*. So the *sukshmata* of *majja* in reaching deeper *dhatus* is much more when compared to other types of *sneha*. *Ghrita* is considered as the best among 4 *snehas* because of the property "*samskarasyanuvartnaat*", [221] which means it attains the property of other substances when *samskara* is given to *ghrita*.

Sneha possess the *sukshma guna*. Though *sneha* is grossly assumed as guru because of the time taken for its digestion at the same time it possess *sukshma guna* also which

helps in easy penetration into the minute *srotases* of the body. *Ghrita* is that *sneha dravya* which is having a unique quality ie; it is *swayam agnivardhaka*. Other *snehas* do not possess this quality. This makes *ghrita* one among the best *snigdha dravyas*.

Chapter on *ghrita*

Among the *chaturvidha sneha, ghrita* is considered to be the best by the virtue of its physical properties as well as therapeutic properties. The importance of *goghrita* and its applicability as a drug can be analyzed by noting its uniqueness under the following categories.

1. Physical properties
2. Chemical properties
3. Therapeutic properties
    a) *Doshaharatwa*
    b) *Vyadhiharatwa*

1. Physical properties

A detail study on the derivation of the word *ghrita* reveals that *goghrita* is the one which is a processed and refined form of diary product. The specialty of *goghrita* lies in the fact that a perishable diary product which is either milk or butter is converted into a non-perishable, preserveable edible product. The *goghrita* procured for the purpose of the current study was a standardized diary product from Karnataka milk federation, Bengaluru unit with the brand name “Nandini Ghee”.

The information about the above product officially details that the product is processed from clarified butter derived from pasteurized, toned milk.

The *goghrita* used for the intervention was the ghee derived from milk and not from curd.

This throws a light on the fact that the properties which are found in the milk should be also present in the processed product, the ghee. However this is not seen practically and is evident in the form of its physical appearance and composition viz increased *snigdhatwa, mridutwa, sandratwa, shlakshnatwa* and reduced *dravatwa* and *saratwa* as compared to *ksheera*.

2. Chemical properties

Ghee is almost anhydrous milk fat.[222]It is by far the most ubiquitous indigenous milk product and is prominent in the hierarchy of Indian dietary. Being a rich source of energy, fat soluble vitamins and essential fatty acids, and due to long shelf life at room temperature (20 to 400C), 80% of ghee produced is used for culinary purposes. The remaining 20% is used for confectionery, including small amounts consumed on auspicious occasions like religious ceremonies.

Cow's milk is a rich source of carotenoids [223]which attributes to the colour of the ghee whereas, in other animal milk, due to lack of carotenoids e.g. in buffalo milk, ghee prepared from it is white, unlike cow ghee which has a golden yellow color. Because of its pleasing flavor and aroma, ghee has always had a supreme status as an indigenous product in India.

Ghee is obtained by clarification of milk fat at higher temperatures of around 120 °C (250 °F) till the water has cooked off, allowing the milk solids to brown. This process flavors the ghee, and produces antioxidants which help to protect it longer from rancidity. Ghee having more residues is a source of phospholipids and has a longer storage life. Because of this, ghee can be stored for six to eight months under normal conditions.

The detail analysis of the chemical properties brings to our notice that the change in the colour, consistency, and chemical composition is a result of the process involved in the conversion of milk into ghee. In Ayurveda this phenomena is attributed to the process called *manthana samskara*. The *manthana* and *agni samskara* can be considered as a key factor in bringing out the variation of the chemical properties in *goghrita*.

3. Therapeutic properties

By the virtue of physical and chemical properties, *goghrita* differentiates itself among other dairy products and is perceived by the organoleptic properties such as odour, taste, touch, and colour. Apart from the uniqueness in the organoleptic properties, *goghrita* interestingly possess distinctive therapeutic properties as

explained in the classical *ayurvedic* text. The therapeutic effects can be classified into 2 major categories viz,

a) *Doshaharatwa*

Any *dravya* possess *guna* which can be understood as physical/chemical property and an effect which can be either a general action or therapeutic action. *Goghrita* having the *guna* such as *snigdha, sara, mridudrava, shlakshana, sheeta* and *agneyatwa* on interaction with the *doshas* and *dhatus* results in therapeutic actions like *vata pitta hara, kaphakara, brimhana, pushti, balya, rasavardhaka, shukravardhaka, agnivardhana, hladana, ropana, varnya* etc. However it is significant to note that the above therapeutic effects are predominantly favorable in nourishing the *rasa dhatu* as all the above therapeutic effects are conducive to *rasa dhatu*.

b) *Vyadhiharatwa*

Indications of *goghrita* for various diseases as mentioned by various *acharyas* who are the authors of the Indian classical texts reveal the fact that *goghrita* is beneficial for the diseases like *unmada, shotha, jwara, udavarta, anaha, apasmara, visarpa, shiroroga, yoniroga, raktapitta, pandu, agnimandya*, etc by the virtue of its *doshaharatwa* and *dhatu vriddhikara* properties owing to its *samskarasyaanuvatana guna*. This in turn is an effect because of physical and chemical properties present and imbibed in the *goghrita* which is explained logically under the context of *guna* and *karma* in the various classical texts.

Chapter on *Rasa Dhatu*

The study of any physiological entity in an organism includes

i. Its physical existence in a certain form
ii. Structure
iii. Function
iv. Physiological phenomena
v. Pathological phenomena
vi. Pathology leading to a disease condition in the organism.

Its physical existence in a certain form

Physical existence of the components of an organism specifically in the case of a human body, in Ayurveda, is considered under the purview of *dhatu*. Among different *dhatu's, rasa dhatu* is one such physical component which is considered to be in the form of a liquid. This is backed by the evidences from the classical texts of Ayurveda. The physical existence of *rasa dhatu* in the form of a liquid makes this *dhatu* functionally potent to travel all across the body with the help of the *doshas*.

Structure

Components of human body are expected to be in a certain structure, macroscopically and microscopically. However in case of *rasa dhatu* macroscopic structure is defined in the classical texts of Ayurveda and the microscopic structure can be comprehended with the help of the functional phenomena explained under the context of conversion of the *dhatus*.

Function

Any physical component in the body will express its existence and is perceived by its function. *Rasa dhatu* being one of the components which expresses its existence in the form of a liquid has some innate functions like *saratwa, dravatwa, apdhatutwa, snigdhatwa/sneha, sukshamatwa*. These functions will be helpful in physiological functions of the same *dhatu*.

Physiological phenomena

A physiological phenomenon of *rasa dhatu* includes its origin as a component of the human body. The classical Ayurveda texts mention the origin of *rasa dhatu* from the *ahara rasa* which in turn is a product of appropriate metabolism. The conversion of the *ahara rasa* into a refined component called *rasa dhatu* can be understood from the literature of *vaishehsika darshana*. The conversion of a certain physical component having certain functions gets converted into a structurally and functionally different component with the help of a process called the *pilupaka*.[224] The process of the *pilupaka* includes physical as well as chemical change. However this involves the influence of another component called the *vijatiya tejas* which comes

in the form of rasa *dhatwagni*. Hence the conversion of *ahara rasa* into *rasa dhatu* happens with the influence of the *rasa dhatwagni*. This physiological phenomenon helps the *rasa dhatu* to obtain the properties which are the cause for the functions mentioned above.

Pathological phenomena

Pathology indicates any variation from the normalcy; this is termed as *vikriti* or *dushti*. Any *dushti* can occur in 2 forms.

1. Quantitative
2. Qualitative

Quantitative

The quantitative *dushti* can be understood as *vriddhi* and *kshaya*. Though the increase or decrease in quantity are not perceived directly (by *pratyaksha*) still it can be inferred through the *vikritaguna* and *karma* (*vriddhi* & *kshaya lakshanas*)

Qualitative

The *praoshja vikaras* can be understood as caused due to qualitative disturbance in a *dhatu*.

Pathology leading to a disease condition in the organism

Though all the pathologies are conditions apart from normalcy, not all pathologies can be termed as diseases. The stage of *vriddhi* and *kshaya*, though pathological are capable of producing disease only if they enter the stage of *sthanasamshraya*. (Finding an association with *dhatu* and localizing at a particular site.)

Chapter on lipid profile.

Lipids are a class of organic compounds that are fatty acids or their derivatives. They have many functions in the body – forms the basic structural components of cell membranes, acts as energy reserves, act as signaling and regulating molecules. They are vital in storing energy as excess calories from food is

stored as fat in adipose tissue, regulating hormones, transport of fat soluble vitamins, maintaining body temperature, transmitting nerve impulses and cushioning vital organs.

Lipids in normalcy maintains the homeostasis but in higher levels (hyperlipidemia) may cause diabetes, cardiovascular disease, kidney disease, liver disease or any other medical conditions. Also hypolipidemia is related to cause anxiety, depression, bleeding disorders or cancer in some cases. Hence it is important maintain lipids in their normal limits.

In the present case study *goghrita* was administered along with food for a period of 30 days. *Goghrita* contains triglycerides, diglycerides, mono glycerides, ketoacid glyceride, glycerylesters, free fatty acids, phospholipids, sterols (cholesterol), etc. Hence lipid profile was evaluated as objective criteria before and after intervention.

Lipid Metabolism

The digestion of lipids takes place in the mouth, stomach and small intestines through the enzymes Lingual lipase, Gastric lipase, pancreatic lipase, Cholesterol Esterase and Phospholipase A2. Lingual lipase and gastric lipase breaks down the fat molecules there by initiating the process of digestion, has a slower activity than the pancreatic lipase. Pancreatic lipase acts on the emulsified fat molecules in the duodenum[225]. Cholesterol Esterase and Phospholipase A2 act on cholesterol and phospholipids respectively. The main end products of lipid digestion are: 2 monoacylglycerides, 1 monoacylglyceride, glycerol, fatty acids, cholesterol, lysophospholipids.

The end products of lipid digestion are absorbed into the blood either directly through intestinal cell or through lymphatic vessels. Lipid molecules in the form of triglycerides, phospholipids and cholesterol esters are transported in the body through chylomicrons and other lipoproteins[226].

Chylomicrons have highest concentration of triglycerides, HDLs have higher concentration of proteins and lesser concentration of fat molecules; LDLs have higher

concentration of cholesterol whereas VLDLs have higher concentration of triglycerides.

Lipid profile evaluates the serum concentrations of cholesterol, triglycerides, lipid carrier proteins majorly high density lipoproteins, low density lipoproteins and very high density lipoproteins in milligrams per deciliter. As end products of fat metabolism are attached to lipoproteins and transported freely in the blood to its target areas, serum is separated from the uncoagulated blood to evaluate Lipid profile hence the name serum lipid profile.

II. Discussion on Materials and methods.

Ayurveda is a science which covers all the factors related to health. Its concepts and theories have an epistemological origin which makes Ayurveda stand as a unique and time tested life science. Ayurveda *Samhitas* clearly distinguish between real and chance effect which establishes the fact that Ayurveda concepts are based on proven and established scientific methods and protocols of application. The theories of Ayurveda are established on the scientific parameters after constantly being subjected to many tests by different *Acharyas* which yielded the same outcome. Throughout the evolution of Ayurveda *Acharyas* stressed on the constant need for research in all aspects of the healing science and we can observe the validation of knowledge through various research methods. Research is the only way available to re-establish old facts, expand the area of knowledge and also help to develop and advance knowledge in various new dimensions.

Goghrita is a widely used product as both food and medicine in Ayurveda. The properties and effect of *goghrita* have been explained remarkably by all *Acharyas*. Though *goghrita* is explained as a *nitya sevaniya dravya* its effect on consumption on a daily basis is always questioned owing to the fact that fatty food is related to incidence of hyperlipidemia and other disorders. In this regard, the present study entitled “STUDY OF SNIGDHAM ASHNEEYAAT WITH THE INTERVENTION OF GOGHRITA (COW’S GHEE) IN RELATION TO THE STATUS OF RASA DHATU AND LIPID PROFILE” was undertaken towards the aim of evaluating the physiological effect of *goghrita* on lipid profile and the

qualitative assessment of *rasa dhatu* in an honest way within the available limited sources and feasibility.

A cohort clinical trial was carried out on a sample size of 100 who fell under the inclusion criteria. They were divided into two groups of 50 each with simple random sampling method. Group A: was given warm and liquid *goghrita* (18gm /day) with meals in 2 divided doses. Group B: was considered as control group. Both the groups were given a simple diet chart to maintain a uniform diet pattern. The participants for the study were taken from SSCASR campus because the food which is being supplied from ashram will help in maintaining the uniformity in the diet pattern. The diagnostic and assessment criteria's including subjective and objective parameters were examined before and after 30 days of intervention. Harvard step test was included as an objective parameter for evaluating the cardiac efficiency as *hrudaya* is considered as the *moola* of *rasavaha srotas*. The acquired data was tabulated and subjected to statistical analysis through "paired t test", Annova and Pearson chi square test and other tests as per requirement.

III. Discussion on Observation & Results

The present study was conducted on 100 individuals who were divided into case and control group consisting of 50 persons in each group. Among them for the case group *goghrita* was administered whereas in control group no medicine was given. The diet pattern in both the groups was similar. Both the subjective and objective parameters were assessed before and after the study. The following parameters are discussed below.

Age

The participants who took part in the present study belong to an age group of 20- 40 years. This factor in relation to the present study was not statistically significant. The study participants belonged to the middle age group and the metabolism happening in them is generally quite optimum. Hence consumption of dietary ghee might not have caused much changes in the lipid profile and also consumption of *goghrita* having *agni deepana* effect[227], would have enhanced the formation of *rasa dhatu* which is found during the assessment after trial.

Gender

Among the 100 study participants 60 of them were females and remaining 40 of them were males. The gender of the participants in relation to study was found to be statistically not significant. Though there is a difference in BMR[228] between genders, in the present study it had no specific significance. As dietary consumption of ghee was well within the recommended daily dose of lipids consumption, [229] the difference in the BMR is probably not reflected in this study with respect to genders.

Religion

All the study participants both in the trial and the control group belonged to the Hindu religion. It is usually noted that in Hindu religion dietary supplement of ghee is well accepted. This was one of the factors which contributed for the feasibility of administration of ghee.

Occupation

As the study was conducted in the campus of Sri Sri College of Ayurvedic science and research hospital, participants were selected from the same campus who were UG students, PG students, physicians, school teachers, laboratory technicians, students of solar energy training center, & persons working with transport department. Occupation did not show any significance in relation to this study. Though the study participants were from varied occupation which involved either physical/mental or a combination of both, the inclusion of ghee in the form of diet has not shown variation. This probably indicates that the dietary inclusion of ghee was optimal irrespective of occupation.

Diet

The study participants include both vegetarians and non-vegetarians. Among them though vegetarians were in greater number this factor was found to be not significant in the current study. This indicates that dietary consumption of ghee had no role to alter the effect in individuals in relation to vegetarian and non-vegetarian food.

Frequency of diet

Among the study participants people who consumed food less than 4 times per day were more in number, those who consumed food 4 times per day were around 37 among 100 study participants and those who consumed food more than 4 times were four in number and those who did not have a fixed pattern in frequency of food intake were around 11 out of 100 participants. This factor i.e.; frequency of consumption of diet was found to be highly significant statistically.

The frequency of diet and also the type of food substances consumed by the individuals who were taken as participants were not altered during the study to avoid any kind of bias as altering the frequency of diet consumption would probably bring changes in the metabolism.

Weight

Weight of the participants was measured before and after administration of *goghrita*. While comparing the means it was observed that in both groups there was a slight increase in weight.

Slight increase in weight was seen in both the groups which were found to be Significant is probably by the virtue of increase in absorption and assimilation due to factors like increased appetite & humidity of the environment. Increase in the appetite could be a contribution of consumption of ghee in the case group as *ghrita* is known to be *agni deepaka dravya* which may cause increase in the amount of food intake which might cause *brimhana* effect on our body. In control group, factors such as humidity might be contributory. *Snigdha guna* has got *kledana shakti* [230]which might be the probable reason for increase in weight in control group.

As we have applied ANNOVA test for statistical analysis, it is considered as case sensitive. Though there is a slight increase in weight as it is based on the number of individuals, it is found to be highly significant.

Harvard step test

The Harvard step test which was conducted before and after the trial for assessing the cardiac efficiency of the study participants of both the group; it was

observed that in case group there was a slight increase in cardiac efficiency and a decrease in efficiency was observed in the control group.

The movement of *vata* in presence of sneha is said to be *asajjamana* [231]which means the flow of *vata* will be feasible in the presence *sneha*. Therefore *vyana vayu* being a sub type of *vata* having its scope all over the body and its predominant seat in *hrudaya* (heart) is aided for its *prakrita karma*. This phenomenon was evident in the case group.

In the control group as there was no supplementation of dietary ghee, there was probably deficit of *snigdhaadiguna*, leading to reduction in cardiac efficiency. Meanwhile it is observed that the cardiac efficiency has decreased and the fundamental reason behind this could be slight increase in weight.

Discussion on *Rasa Dhatu Karma*

Tushti* and *Preenana

According to the *siddhanta ksheenaah vardhayitavyam* [232]

Tushti and *Preenana* which is one among the *rasa dhatu karma*, in the case group were found to be statistically highly significant. In the control group there was no change in this *lakshana* among the participants and hence was statistically not significant.

By *swabhava* it is seen that the factors which are at the optimal level are maintained even with the increased usage of the corresponding enhancing factors, whereas the factors which are in deficiency are brought to normalcy with the usage of the corresponding enhancing factors. Meanwhile with the absence of corresponding enhancing factors the entity remains as it is.

So this might be the reason that the control group did not show any changes whereas there was significant increase in *tushti* and *Preenana karma* of *rasa dhatu* in case group.

Raktapushti

Raktapushti karma of *rasa dhatu*, was found to be statistically highly significant in the case group and in the control group there was no change in this *lakshana* among the participants and hence was statistically not significant.

Dietary ghee is considered as the best form of sneha.

Snehadravya, by the virtue of its properties like *drava, snigdha, mriduguna* are similar to the properties of *rasa dhatu*. Therefore dietary consumption of ghee will lead to increase in *rasa dhatu* by *samanyasiddhanta*.[233] This has 2 aspects.

i. *Rasa dhatu* and *rakta dhatu* share similar properties such as *sara, drava, eeshat snigdhata*. Therefore *rasa pushti* will contribute for *raktapushti* simultaneously.

ii. By *ksheera dadhi nyaya*, it is understood that the preceding *dhatu* will nourish the subsequent *dhatu*.

In the control group, absence of the supplementation of sneha might be the reason for no change in the status of *raktapushti*.

Discussion on *Rasa Dhatu vriddhi lakshanas*

Agnisada

Agnisada which means reduction in the capacity of digestive fire was statistically found to be very highly significant& it was not found to be statistically significant in the control group.

Ghrita is *sheeta, snigdha* but *agneya* in nature by the virtue of its *samskara*. Therefore it has the capacity to increase the *agni*. Meanwhile the factors responsible for the digestion include *ushma ,vayu, kleda, sneha, kala* & *samayoga*.[234] Among the above *ghrita* not only has *sneha guna* but simultaneously can aid for *anna kledana*. Therefore 2 significant factors responsible for the process of digestion is contributed by the use of dietary ghee. This might be the probable reason for relieving *agnisada*.

In the control group, absence of the supplementation of sneha might be the reason for no relief in *agnisada*.

Praseka

As the *praseka* is *lakshana* of *vikruta kapha, ghrita* helps to rectify the *kapha dosha*. This *lakshana* was found to be reduced significantly.

Alasya

Ghrita by virtue of its *guna* does provide *pushti* to *shareera* which is helpful in increasing the energy level which helped to overcome *alasya* in the case group individuals. As in control group due to absence of *ghrita* supplementation significant changes were not observed.

Gourava

Ghrita does *agnivardhana*. *Gourava* is an *ama lakshana*. As treatment of *ama* is nothing but *agnivardhana,* so by using *ghrita gourava lakshana* was overcome.

Shwaitya

Shwaitya is one of the presentations of *varna vikriti* and *varna prasadana* is one of the functions of *ghrita*. Hence there is absence of *shwaitya* in case group though it was not significant statistically. In control group as there was no supplementation of ghee this effect of *ghrita* is found to be absent.

Shaitya

Sheeta is specific property of *ghrita*. So there was no change in both the groups.

Angashaithilya

As *ghrita* possesses the *rasayana* property this helps to overcome the *shaithilyata* of *anga* or *dhatus* because of this property it helps to build each and every *dhatu* to become more *prashasta* and each and every *anga* is made up of *dhatus*.

Shwasa* and *Kasa

Ghrita is *agni vardhana dravya*. So it is acting on *amashaya*. As *kasa* and *shwasa* are the 2 symptoms which require *agni vardhana chikitsa* and *ghrita* posess this property of *agnivardhana* that's why it works. It was not found to be significant because the duration of supplementation of ghee might not be sufficient to bring significant changes.

Atinidra

Intake or non-intake of *ghrita* has no role over *tamoguna* which is the root cause of *nidra*. Hence the finding is non-significant.

Rasa kshaya lakshanas
Roukshya

Rasa kshaya (depletion) *lakshanas* were assessed before and after trial in both the case group and control group participants.

As *ghrita* is known for its *snigdha guna* by the virtue *gunavisheha* of *samanya vishesha siddhanta* it reduces *roukshya lakshana*.

Shrama

Ghrita being a lipid substance is well known for its rich calories. So intake of ghee definitely brings down *shrama* which was seen in trial group significantly. Because of lack of supplementation of *ghrita* there was no change seen in the control group.

Shosha

Ghrita is derived from *ap mahabhuta* [235] so it is nourishing in nature. So it combats *shosha* by providing the necessary element which is required. Due to absence of supplementation this was not found to be significant in control group.

Glani

Ghrita by virtue of its *karma* is *tarpana* in nature. This might be the probable reason for overcoming *glani* in the trial group which was found to be highly significant. Absence of supplementation of *ghrita* in the control group might be responsible for non-significant change was in the control group.

Shabdaasahishnuta

Rasa dhatu comprises of predominantly water element. In *rasa kshaya lakshana* as *rasa dhatu* decreased from body that means water element from body is depleted. By *samnyavishesha siddhanta* for managing it we need to supply water element which is predominantly present in *ghrita*. Hence these *lakshanas* including *shabdaasahishnuta* was found to be relieved. In the control group as the *ap mahabhuta* has not been taken care of, the *lakshanas* were not relieved and it was found in more number of individuals.

Discussion on *Twak sara lakshana*

Among the *twak sara lakshanas snigdha, shlakshna* and *prabha* were found to be highly significant and *shlakshna* as very highly significant statistically among the case group other *lakshanas* like *mridu, sukshma, alpa, gambheera sukumaraloma* etc were statistically not significant.

Acharya Charaka has metioned *twak sara lakshana* instead of *rasa sara lakshana*. This means to say that there exists a close relationship between *rasa* and *twak*. When the *gunas* of *rasa dhatu* are being well nourished, it results in the formation of good quality *rasa dhatu*. So in turn *twak* also gets nourishment from the same. The requisite for rasa or *twak* nourishment is already present in *ghrita*. Many *acharyas* like *Acharya Charaka*, *Acharya Kashyapa* and in *Kaiyadevanighantu varna prasadana* is one among *ghrita karma's*. So by considering all these we can probably say that by consumption of *ghrita*, there is proper formation of *rasa dhatu*, and proper

nourishment of *twak* which has led to improvement of *twak sara lakshanas* in the trial group, whereas in the control group as *ghrita* was not supplemented, *sara lakshanas* were not found to be statistically significant.

Discussion of *Rasa pradoshajavikara*

Rasa pradoshajavikara was assessed among the study participants before and after the study.

Discussion of non-significant features of rasa *pradoshajavyadhi* symptoms

For all these disorders *rasa dhatu* is one among the *dushya* but cannot be considered as the only *dushya*. Hence administration of *ghrita* in the said quantity and duration is probably not sufficient to overcome these *lakshanas*.

Ashraddha, Aruchi, Agninasha

Ghrita possess the property of *agnideepana* and these 3 symptoms are directly depending upon status of *agni*. So as *ghrita* is correcting the *agni*, probably these symptoms shows significant outcomes.

Tandra

When the individual cases of case group is considered, 11 people had *tandra* and after treatment this was absent in all individuals. Hence the result was statistically highly significant. As consumption of *ghrita* increases *agni*, it also works as supportive elements to *indriyas* which will result in *prachurata* of their respective *karya*. That means to say the keenness of *indriya* functioning will increase and since *agni vardhana* effect will imply clarity in srotases, this *lakshana* of *tandra* was absent after treatment in case group. But in control group before treatment it was 14 and after 1 month it increased to 16 persons in the group. As *ghrita* was not supplemented to this group its beneficial effect in bringing *prachurata* to the *indriyas* was not seen and hence *tandra* increased.

Angamarda

Due to the consumption of *goghrita*, which possesses *snigdha, shlakshna guna*, it does *vata shamana* which probably helps in relieving *angamarda lakshana*.

Gourava* as in *pradoshaja vikara* & *Srotorodha

For relieving *gourava* & *srotorodha*, which is also one of the major symptom of *ama*, *agnivardhana* is most important treatment modality. *Ghrita* helps to improve the *agni*, hence probably *srotorodha* was relieved which was significant.

Discussion on Lipid Profile

Probable mode of action of *ghrita* on lipids:

Total Cholesterol

When both the means of before trial and after trial among the case group are compared there is a highly significant reduction seen in the total cholesterol level. When the means of before trial and after trial among the control group are compared there is an increase in the cholesterol level. When the change in between these groups and within the groups were measured using ANOVA test it was found to be statistically very highly significant.

Agni is a major component for any transformation. It view of total cholesterol - *jataharagni, bhutagni* and *dhatwagni vyapara* is at its normal functional capacity. The cholesterol in the diet which is administered for the case group, stimulates the liver cells for its incorporation in forming the bile acids. Bile juice and its constituents are a major asset for digestion, absorption and excretion of fats.[236] This can be explained as follows:

- ♣ Digestion- the dietary lipids is being acted upon by the bile juice in the intestine and after emulsification done by bile salts, it is rendered for the action of pancreatic lipase and other enzymes. After the enzymatic action it is rendered into the monomer forms.

- ♣ Absorption – The action of ACAT enzyme at the level of intestinal cells and the action of LCAT enzyme at the level of serum to

incorporate these monomers into lipoproteins like LDL and VLDL and then transported through blood for storage in adipose tissue.

- ♣ Excretion – The cholesterol which is brought to the liver is being utilized for production of hormones, formation of bile acids which helps in excretion of cholesterol.

Hence secretion of more bile accounts for the decreasing cholesterol value.

The cholesterol oxides in the *goghrita*, decreases ACAT activity in the intestinal mucosal cells, [237] thereby reducing the uptake of cholesterol. Liver is producing the cholesterol optimally as there is reduced dietary uptake. There by maintaining the levels of cholesterol in the blood. Probably this may send a negative feedback signal so that excess cholesterol production in the liver does not happen at the same time the cholesterol level in the blood may send a negative feedback signal to ACAT to reduce the uptake as it serves as a regulator of intracellular cholesterol homeostasis.

The decrease in total cholesterol in this study shows the equilibrium between its digestion, absorption and excretion. By this we can understand the *jatharagni*, *bhutagni* and *dhatwagni* is functioning well. Along with it even the optimal function of samana and *vyana vata* can be understood.

Triglycerides

When both the means of before trial and after trial among the case group are compared there is a highly significant reduction seen in the triglyceride level. When the means of before trial and after trial among the control group are compared there is an increase in the triglyceride level. The change in between these groups were measured using ANOVA test it was found to be statistically very highly significant. Whereas the change within the group was found to be not significant statistically.

The study participants were given a common diet chart which restricted the ingestion of calories. In the case group whatever food which was consumed was getting converted to their monomers after digestion & was completely utilized for their respective functions. As the transportation of triglycerides is bidirectional in the

blood, lipid profile just measures the amount of triglycerides which is present in the blood and does not differentiate between the triglyceride which is brought from the adipose tissue for metabolism or the one which is being taken towards the adipose tissue for deposition. By the statistically highly significant reduction seen in the triglyceride level we can understand, there was no added calories which was getting converted into triglycerides, at the same time, the fat metabolism absorption, storage and utilization, is in equilibrium.

HDL – High Density Lipoprotein

The means of before trial and after trial among the case group when compared showed an increase seen in the high density lipoprotein level. When the means of before trial and after trial of the control group were compared there was a reduction in the high density lipoprotein level. The change within the group was not significant and the change between the groups was found to be statistically highly significant.

The lipoproteins like HDL helps in transportation of the *sneha* from periphery to the liver for further metabolism and excretion of cholesterol. The main functions of HDL are-[238]

i. They accept cholesterol from peripheral tissues and other lipoproteins → carry to the liver where cholesterol is metabolized and excreted via bile.

ii. HDL donates various apolipoproteins including apo - C to chylomicron and VLDL. The triglycerides of chylomicron and VLDL can be hydrolysed by lipoprotein lipase only after they (= chylomicron and VLDL) have acquired apo - C.

iii. HDLs also accept various apolipoproteins from other lipoprotein particles.

Lipoproteins carry the *snehamsha* to different parts of the body. In the body any movement is by the influence of *vata* and transportation in particular is because of *vyanavayu* which does the transportation of nutrients simultaneously all over the body.[239]

After the digestion of go*ghrita* along with *ahara* (*snigdha ashana*) the *ahara rasa* which is formed is transported from one *dhatu* to the next. *Ahara rasa* which is

transported in the *srotases* gets transformed to the respective *bhoutika amsha* by its *bhoutikagni* and gets absorbed and metabolized by the respective *dhatus* and *dhatwagnis* thereby nourishing it.

HDL carries the *snehamsha* from the tissues and brings it to the liver for further metabolism. By the intake of *goghrita* the *agni* which has increased helps in the formation of good quality *ahara rasa*, which in turn nourishes all the *dhatus* through their respective *dhatuvaha srotases*, i.e., as explained in *khale kapota nyaya*. This indicates that the functional efficiency of *agni*, lubrication in the *srotases* have been improved, there by facilitating the movement of *vyanavayu* without any obstruction.

The increase in HDL can be understood that the *agni* has improved based on the observations that whatever food which is consumed is properly being metabolized by *jatharagni* and there is no extra storage of energy in the form of adipose tissue, at the same time it indicates the utilization of stored energy by bringing it to liver for further catabolism. Hence it shows that the *medo dhatwagni* has become *deepta*.

Thus this gives a direct indication that *jatharagni* is having better efficiency after intake of *ghrita* and the rise in HDL concentration after trial is a beneficial effect.

LDL – Low density lipoprotein and Very low density lipoprotein (VLDL)

The means of before trial and after trial among the case group when compared showed a reduction in the low density lipoprotein level. When the means of before trial and after trial of the control group were compared there was an increase in the low density lipoprotein level. When the change in between these groups and within the groups were measured using ANOVA test it was found to be statistically very highly significant.

The means of before trial and after trial among the case group when compared showed a reduction in the very low density lipoprotein level. When the means of before trial and after trial of the control group were compared there was an increase in the very low density lipoprotein level. The change within the group was not significant and the change between the groups was found to be statistically highly significant.

The study participants were given a common diet chart which restricted the ingestion of calories. The digestion is optimal thereby the absorption is proportional to the ingested calories. At the same time we can also understand that there is no conversion of extra calories into fat which gets stored. This justifies the reduction in the levels of LDL and VLDL as these are the lipoproteins which carry triglycerides and cholesterol to their storage areas. This shows that the *agni vyapara* is happening at its maximal functional capacity.

As we see the physiological functions carried out by lipids, most of them we can correlate it to the functions of *rasa dhatu*. So we can understand that the effect of *ghrita* in the body, though it has brought in reduction of the values of lipid profile except HDL, the functions it carries out is being optimal. So in that way, we can say that the *rasa dhatu* is improving functionally.

Discussion on *Abhyavaharana Shakti* and other Components of *Agni Pareeksha*.

Abhyavaharanashakti

The status of *abhyavaharanashakti* (food intake capacity) was checked whether it was *pravara*, *madhyama* or *avara*.

To know the sustenance of the results when analyzed before, after and at the end of 1 month, it was observed that 4 individuals had the same status of *abhyavaharana shakti* after treatment also, whereas 46 participants showed improvement in the case group. In the control group all the participants had same status of *abhyavaharana shakti* after trial also with no any reduction in its status. So this was statistically very highly significant.

Jeerna lakshanas

Jeerna lakshanas of *ahara* [240]were assessed before and after the study. Following were the outcomes

Abhyavaharana Shakti as well as *jeerna ahara lakshanas* is directly dependent upon the quality of *agni*. If *agni* is proper and if it is improved, *abhyavaharana shakti* as well as *jeerna ahara lakshanas* are seen improved properly in the individuals. Being *agnivardhan* is one of the most important characteristic feature of *ghrita* in

abhyavaharana shakti pariksha and *jeerna ahara lakshana pareksha*. Hence in case group almost all features is seen improved significantly.

Benefits of *snigdha bhojana*

Benefits of *snigdhabhojana* [241]were assessed before and after the study. Following were the outcomes

Bhujyamaanam Swadate

Bodhaka kapha and *goghrita* possess *samana bhavas* such as *snigdha, shlakshna, drava ,mridu* etc *gunas*. As *ghrita* does *upachaya* of *kapha* which includes *bodhaka kapha* also, this helps in enhancing the taste of the food.

Agni Udirana* and *Kshipra Jara

The *ushna, teekshna, laghu* qualities of *agneya pitta* are overcome by *sheeta, manda, guru* qualities of *ghrita*.

In treatises ghee has been described to alleviate *pitta* and increase *agni*. Here *pitta* is *agneya* matter and *agni* also in the body is not available anywhere else other than *pitta*. Hence Sushruta says –

"Na khalu pitta vyatirekatanyoagnihupalabhyate"[242]

Thus *agni* is supposed to be a part of *pitta*. All *dravyas* which increases the *agni* also increase the *pitta*.

Here the question arises as to why *ghrita* does not follow this rule.

A study of the difference in the qualities of the *pitta* and *agni* will reveal that the *pitta* is only an *agneya dravya* but not the *agni* itself.

Pitta	***Agni***
Snigdha	*Ruksha*
Fluid	Not fluid, not solid
Taste - *katu, amla*	No taste
Smell of raw meat	No smell

The *panchabhoutik* composition of *agni* (*jatharagni*) is having the predominance of *agnimahabhuta* whereas the *pitta* is having the predominance of *Ap* and *Prithvimahabhuta* along with *agnimahabhuta* which can be attributed to the qualities of fluidity and taste which the *pitta* has. Thus in the body *pitta* and *agni* are the two different *mahabhoutik* entities. Similarly the *pitta* has the qualities of *rasa, gandha* etc while *agni* hasn't. Hence these two can be increased or decreased irrespective of each other.

Even when it is so, *ghrita* has the qualities like *sheeta* etc. which obviously may subdue *agni*. Then the question arises as to how *ghrita* is capable of *agnikaratwa*.

Agnikaratwa means, *agni- udeerakatwa*.

a) By decreasing the unwanted qualities like *ruksha, khara, chala*, etc of *samanavayu* due to *snehadi gunas* of ghee, the latter performs the functions of *prakriti sthapana* and hence helps *samana vayu* to inflame the *agni*.

b) Also *ghrita* itself acts as a fuel for combustion and helps in burning. By consumption of *ghrita* along with *ahara* as in "*snigdham ashneeyaat*" the *ghrita* helps in prolongation of the action of *agni* i.e; for longer duration. The very function of *sneha*, according to *Nyaya* philosophy is said as "*dahanukulam*".

Darshanashastra also believes that *ghrita* increases *agni*. They give yet another reasoning that *agni* is *panchabhoutik* and *apyagni* gets *bala* from *ghrita* due to *samanagunanyaya*.

Grahani is also said as *pittadharakala*. *Grahani* is the chief organ which receives *ahara* and it is in this region *annapachana*, *shoshana* and *sara kitta vibhajana* takes place. *Ghrita* provides *bala* to *grahani* and thereby does *agni vardhana* and helps in *kshipra jarana prakriya*.

Vatanulomana

As *goghrita* is having *snigdha, sara, mridu gunas* and it is also a *agni vardhaka* it facilitates *vatanulomana*.

Indriya Dhardhya

It is a known fact that intake of *goghrita* causes *shareeropachaya* and *balavardhana*. As the *indriyas* are one among the *shareera ghatakas*, it also improves the *indriya dardhyata* as similar effect is seen in *shareera* also.

Shariropachaya* and *Bala

Ghrita is having the *gunas* such as *snigdha, guru, picchila* etc. *Acharya Sushruta* explains the function of these *gunas* as *balakrit*. *Hemadri* explains the function of *guru guna* as the one which provides *pushti* to the *deha*. Also these *gunas* does nourishment of *kapha* so the *bala* also increases. *Kapha* provides *bala* to the *shareera*. Hence it is also called as *balasa*.

Varna

Acharya Sushruta mentions four *karmas* for *snigdha guna* present in *sneha dravyas* among which *varnakara* is also one. While explaining the functions of *pitta*, it is stated that the production of normal and abnormal colour of the skin is due to *pitta*. Chakrapani in his commentary has stated that these functions belong to the *bhrajaka pitta*. [243]*Bhrajaka pitta* is located in the skin. Dalhana explained that *twak* is understood as the *bahyatwak* known as *avabhasini*. There is difference in the structure of the skin as explained by *Charaka* and *Sushruta*. According to *Sushruta*, the skin has seven layers,[244] the first layer is called *avabhasini* and it serves to reflect all colours and is capable of being tinged with hues of all the five *mahabhutas*. The other six layers are *lohita, shweta, tamra, vedini, rohini, mamsadhara*.

The functions of *bhrajaka pitta* are as follows

1) Production of normal colour of the skin.

2) Maintenance of the lusture or complexion of the skin is by the *paka* (transformation or conversion) of the absorbed substances.

Skin colour

All the substances in the body are the product of digestion and metabolism, controlled and conducted by the *pitta.* Therefore the substances which contribute to the normal colour of the skin are also the products of metabolism. The skin is an *upadhatu* produced in the *prasadapaka* of the *mamsagni*. Therefore it is imperative that the six upper layers of the skin are produced by the lowermost seventh layer *mamsadhara* and similarly the substances which contribute to the normal colour and complexion of the skin.

There are four pigments known to influence the skin colour:

1) **Melanin** - A yellow to black pigment present mainly in the epidermis, functions not only in contributing colour quality to the skin but also in protecting from ultraviolet rays. The amount of melanin causes the skin's colour to vary from pale yellow to reddish brown to black. The number of melanocytes is about same in all people, but the differences in skin colour are mainly due to the amount of pigment the melanocytes produce and transfer to keratinocytes.

2) **Carotene** - A yellow orange pigment found in lipid rich areas such as stratum corneum and fatty areas of the dermis and subcutaneous layer. The typical yellow-colored fat of humans is a result of fat storage of carotenes from their diets. There are different forms of carotene among which β - carotene is an antioxidant. This is a precursor of vitamin A, which is used to synthesize pigments needed for vision.

3) **Oxyhemoglobin**- This imparts a red component to the skin and is especially evident in areas where there is a rich arterial supply, such as the skin of the face, neck, palms and soles. Skin colour ranges from pink to red depending

upon the oxygen content of the blood moving through capillaries in the dermis. The red colour is due to hemoglobin, the oxygen carrying pigment in the red blood cells.

4) **Reduced hemoglobin** - It contributes a bluish or purple character to skin colour and is more evident in the lower parts of the trunk. Factors such as melanin concentration and skin thickness tend to suppress the hemoglobin pigment colour component effect.

Goghrita is having a rich source of carotene. This imparts the yellow colour to the ghee. Intake of *sneha* nourishes all the fatty depositions present in the body. Therefore the subcutaneous fat layer also gets nourishment and further deposits the carotene. Because of the above said reasoning intake of *ghrita* is said as *varnya*.

Discussion on WHO assessment of quality of life

Domain 1

This section contains the questions related to the physical welfare of a being**.** The questions framed in this section includes information regarding various areas like pain, energy, sleep, mobility, activities etc. There was an improvement seen in the means when compared between the means of before trial and after trial. This suggests that in case group there was improvement in the physical wellbeing of the individuals with the consumption of ghee and in control group this improvement was not seen.

By virtue of the *gunas* of *ghrita* like *agni deepana, vatanulomana, mridukara, brimhana, ojovardhaka, balya rasayana, pushti, jeevana* etc the *ahara rasa* which is well formed is being transported in the *srotases* without any obstruction, hence all the *dhatus* are receiving proper nourishment. Thus the physical attributes like daily activities, sleep, energy for daily activities etc have improved with the consumption of *ghrita*.

Domain 2

This section involved the questions regarding the psychological related areas such as, positive feelings, thinking, self-esteem, body image, negative feelings and spirituality. In the second domain, the means of the two groups when compared, we

can see an increase in the means of the case group after the trial compared to before trial which was found to be statistically highly significant. This suggests that consumption of ghee had a positive effect in the case group regarding the psychological domain involved in the participants of the current study. In the control group, no difference in the means was observed.

Owing to the *gunas* of *ghrita* like *mridu, sukshma, snigdha* etc and *karmas* such as *vapusthairya, ayuhita, alakshmihara, medha vardhaka, buddhivardhaka, smriti karaka, rasayana ojovardhaka* etc both *manasika* and *shareerika swasthya* has improved. Thus the phychological attributes such as thinking, positive feeling, self-esteem, etc have improved with the consumption of *ghrita*.

Domain 3

This domain consisted of questions related to how the individual maintained social relationships such as personal relation, social support, sexual activity etc. The changes in the means of the case group after trial was highly significant and no changes were observed in control group.

Owing to the *gunas* of *ghrita* like *mridu, madhura, sukshma, snigdha* etc and karmas such as *vapusthairya, ayuhita, alakshmihara, medha vardhaka, buddhivardhaka, smriti karaka, vrishya, rasayana, prajakamahita, shukra shodhana, yoni shodhana, ojovardhaka* etc both *manasika* and *shareerika swasthya* improves making an individual present himself healthy , sound and thriving with good personal and social conduct. Thus the social relationships such as personal relations, social support and sexual activities, etc have improved with the consumption of *ghrita*.

Domain 4

This domain consisted of questions related to the environment in which the person is living. Questions were based on areas such as safety, financial status, services availability, information, leisure, transportation etc. The changes in the means of the case group after trial was highly significant and no changes were observed in control group.

Owing to the *gunas* of *ghrita* like *snigdha*, *mridu*, *sukshma*, etc and *karmas* such as *alakshmihara, rakshoghna, medha vardhaka, vapusthairya, ayuhita, buddhivardhaka, smriti karaka, ojovardhaka, rasayana* etc both *manasika* and *shareerika swasthya* has improved. The way an individual responds to the outside stimulus has improved positively which shows the *satwa guna* of the *manas* has improved. Hence the daily hurdles, challenges, disappointments which he/she comes across is not affecting his mental status and is still happy and satisfied within oneself. Thus the environmental attributes such as financial status, services availability, information, etc have improved with the consumption of ghrita.

Thus with the observation of all the above subjective and objective parameters it can be said that "Snigdham Ashneeyaat" [245]which is mentioned as one among the first rule for consumption of ahara is found to be highly beneficial in the good quality formation of rasa dhatu and also bringing about beneficial changes in the lipid values of the individuals.

CONCLUSION

In the current study it has been observed in the case group that because of administration of ghee following were the outcomes.

- There was optimum level of rasa dhatu karma
- Vriddhi and kshaya lakshanas were brought back to normalcy
- Pradoshaja vikaras was reduced to a very great extent.
- Total cholesterol, Triglycerides, LDL, VLDL concentration reduced
- HDL (Good Cholesterol) concentration increased
- There was no change in rakta sara lakshanas.
- Harvard step test suggests good health of heart or increased cardiac efficiency
- There was an improvement in all the domains which assessed the quality of life of an individual
- All the above mentioned details were not found in control group.

SUMMARY

Ahara (diet) plays an important role in our daily life. Among the *ahara, sneha* is considered as *rasayana* which means the intake of *sneha* like *ghrita* rejuvenates the body and promotes longevity. While explaining about the rules for taking food, Ayurveda explains that one should have food which is made *snigdha* and advocates the intake of *ghrita* daily as *ajasrika rasayana*.

Every food item we consume encounters with *agni* and results in the formation of *ahara rasa* and thus *rasa dhatu*. Even the ghee consumed will be making an entry in to the *rasa dhatu* thus circulating all over the body. *Rasa* which is considered as the *aadya dhatu* continuously circulates and forms the *aadhara* for nourishment of consecutive *shad dhatus*. It circulates along with *rakta dhatu* all throughout the body.

Lipid profile is a panel of blood tests that serves as an initial broad medical screening tool for abnormalities in lipids, such as cholesterol and triglycerides.

The study was conducted involving 100 participants. They were divided into 2 groups – each group consisting of 50 individuals. Individuals following inclusion criteria was selected by judgment sampling method for the study after taking informed consent. Total number of individuals were randomly divided into two groups.Trial group was given warm and liquid *goghrita* along with meals in 2 divided doses for 30 days at the dose of 20 ml (18 gms per day). Control group was not provided with any supplements. All investigations, *rasa dhatu pareekshana*, and *agni pareekshana* was carried out, before and after the study.

It was observed that there was positive healthy changes and significant difference found in the scores of before trial and after trial in case group with respect to the subjective parameters i.e; *rasa dhatu pareekshana, agni pareekshana* and also values of lipid profile which was taken as objective parameter and in control group the changes seen were not pro healthy. The difference between case group and control group within the group and in between the group was found to be highly significant while comparing the values of after trial and before trial.

It was evident from the study that *snigdham ashneeyaat* as advocated by our Acharyas, is highly effective in maintaining healthy status of *Rasa Dhatu* and also maintains the lipid values well within the normal range.

BIBLIOGRAPHY

1 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008: P: 174

2 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008: P:236

3 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008: P: 174

4 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition 2007, P: 24

5 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition 2008: P. 513

6 K. Sembulingam, Prema Sembulingam, Essentials of Medical Physiology, Jaypee Brothers Medical Publishers, New Delhi, Edition 8, Chapter 6, P.59

7 K. Sembulingam, Prema Sembulingam, Essentials of Medical Physiology, Jaypee Brothers Medical Publishers, New Delhi, Edition 8, Chapter 6, P.59

8 K. Sembulingam, Prema Sembulingam, Essentials of Medical Physiology, Jaypee Brothers Medical Publishers, New Delhi, Edition 8, Chapter 45, P.309

9 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 38

10 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008: P:236

11 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P:253

12 Amarakosh of Amarasimha, with the Commentary Vyakhyasudha or Rāmāsrami of Bhanuji Diksita, 2nd edition, Chaukhamba Sanskrit Pratishthan, Delhi, 1987. P:165,166, 244-245

13 Shabdakalpadruma by Raja Radhakanta Deva, Chaukhambha Sanskrit Series, Varanasi, 3rd edition, 1967. Part 5 Pg 456, 457

14 Amarakosh of Amarasimha, with the Commentary Vyakhyasudha or Rāmāsrami of Bhanuji Diksita, 2nd edition, Chaukhamba Sanskrit Pratishthan, Delhi, 1987. P: 80, 81

15 Shabdakalpadruma by Raja Radhakanta Deva, Chaukhambha Sanskrit Series, Varanasi, 3rd edition, 1967. Part 5 P : 456, 457

16 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 181

17 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008: P.185

18 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 19

19 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 178

20 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 392

21 Amarakosh of Amarasimha, with the Commentary Vyakhyasudha or Rāmāsrami of Bhanuji Diksita, 2nd edition, Chaukhamba Sanskrit Pratishthan, Delhi, 1987. P: 80, 81

22 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 154

23 Amarakosh of Amarasimha, with the Commentary Vyakhyasudha or Rāmāsrami of Bhanuji Diksita, 2nd edition, Chaukhamba Sanskrit Pratishthan, Delhi, 1987. P: 270,318

24 Shabdakalpadruma by Raja Radhakanta Deva, Chaukhambha Sanskrit Series, Varanasi, 3rd edition, 1967. Part 5 P : 456, 457

25 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 120

26 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 81

27 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 120

28 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P:243

29 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 155

30 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 155

31 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 224

32 Shri Brahmashankara Mishra and Sri Rupalalji Vaisya, Bhavaprakasha of Sri Bhava Mishra, edited with Vidyotini hindi commentary, 11th edition, 2007, part 1, Chaukhambha Sanskrit Bhavan, Varanasi. P: 775

33 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 224

34 Vaidyabhushanam K. Raghavan Thirumulpad Bhadanta Nagarjuna's Rasavaisheshika May 2010, Arya Vaidya Sala, Kottakkal , Kerala P: 181

35 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P:12

36 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 153

37 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 223

38 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition 2008, P: 138

39 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 155

40 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:138

41 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 155

42 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 224

43 Shri Brahmashankara Mishra and Sri Rupalalji Vaisya, Bhavaprakasha of Sri Bhava Mishra, edited with Vidyotini hindi commentary, Mishra prakaranam, 11th edition, 2007, part 1, Chaukhambha Sanskrit Bhavan, Varanasi. P:189

44 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P:12

45 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:138

46 Vaidyabhushanam K. Raghavan Thirumulpad Bhadanta Nagarjuna's Rasavaisheshika May 2010, Arya Vaidya Sala, Kottakkal , Kerala P: 181

47 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:138

48 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 153

49 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 155

50 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 224

51 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 224

52 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 153

53 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 224

54 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:138

55 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 153

56 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 224

57 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:138

58 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 153

59 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:339

60 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 153, 154

61 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:81

62 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, Chikitsa Sthana edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 143

63 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:82

64 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:85

65 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 247

66 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 85

67 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P:247

68 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P:248

69 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 83

70 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, Chikitsa Sthana edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 141

71 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P:246

72 Ravidutta Tripathi Shrimad Vriddha Vagbhatacharya krita Ashtanga Sangraha, Saroj hindi commentary, reprint 2003, Chaukhambha Sanskrit Pratishthan, Delhi, P: 455

73 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, Chikitsa Sthana edition reprint 2007, Chaukhamba Sanskrit Sansthan, Varanasi. P: 135

74 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, Chikitsa Sthana, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 133

75 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P:246

76 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 83

77 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 83

78 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 244

79 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:175

80 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:513

81 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 174

82 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 516

83 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 240

84 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 332

85 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 513

86 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 224

87 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 9, 10

88 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 452
89 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 514
90 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 515
91 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 512
92 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 169
93 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 512
94 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 512
95 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 512
96 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 512
97 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 513
98 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 515
99 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 515
100 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 159
101 Swami Satyaprakasha Sarasvati and Udaya Vir Viraj, Atharvaveda Samhita, Atharvaveda Kānda 7-23-82-87-6, Veda Pratishthana, New Delhi.
102 Swami Satyaprakasha Sarasvati and Satyakam Vidyalankar, Rgveda Samhita, Rigveda Adhyaya 2- m, 1-A, 3-a, 24-1, Veda Pratishthana, New Delhi.

103 Amarakosh of Amarasimha, with the Commentary Vyakhyasudha or Rāmāsrami of Bhanuji Diksita, 2nd edition, Chaukhamba Sanskrit Pratishthan, Delhi, 1987. P:320,321,

104 Amarakosh of Amarasimha, with the Commentary Vyakhyasudha or Rāmāsrami of Bhanuji Diksita, 2nd edition, Chaukhamba Sanskrit Pratishthan, Delhi, 1987. P: 320, 321

Shri Brahmashankara Mishra and Sri Rupalalji Vaisya, Bhavaprakasha of Sri Bhava Mishra, edited with Vidyotini hindi commentary, 11th edition, 2007, part 1, Chaukhambha Sanskrit Bhavan, Varanasi. P:470

Sri Narahari Pandit's Rajanighantu, English translation by Dr. Satish Chandra Sankhyadhar & Dr. Deepika Sankhyadhar, Ksheeradi varga, 1st edition 2012, Chaukhambha Orientalia, Varanasi. P: 826

Shabdakalpadruma by Raja Radhakanta Deva, Chaukhambha Sanskrit Series, Varanasi, 3rd edition, 1967. Part 2 P : 365,367

105 Shri Brahmashankara Mishra and Sri Rupalalji Vaisya, Bhavaprakasha of Sri Bhava Mishra, edited with Vidyotini hindi commentary, 11th edition, 2007, part 1, Chaukhambha Sanskrit Bhavan, Varanasi. P: 470

106 Shri Brahmashankara Mishra and Sri Rupalalji Vaisya, Bhavaprakasha of Sri Bhava Mishra, edited with Vidyotini hindi commentary, 11th edition, 2007, part 1, Chaukhambha Sanskrit Bhavan, Varanasi. P: 470

107 Shri Brahmashankara Mishra and Sri Rupalalji Vaisya, Bhavaprakasha of Sri Bhava Mishra, edited with Vidyotini hindi commentary, 11th edition, 2007, part 1, Chaukhambha Sanskrit Bhavan, Varanasi. P: 470

108 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 473

109 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 178

110 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 178

111 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 166

Shabdakalpadruma by Raja Radhakanta Deva, Chaukhambha Sanskrit Series, Varanasi, 3rd edition, 1967. Part 2 P : 395

Ravidutta Tripathi Shrimad Vriddha Vagbhatacharya krita Ashtanga Sangraha, Saroj hindi commentary, reprint 2003, Chaukhambha Sanskrit Pratishthan Delhi, P: 102

Shri Brahmashankara Mishra and Sri Rupalalji Vaisya, Bhavaprakasha of Sri Bhava Mishra, edited with Vidyotini hindi commentary, 11th edition, 2007, part 1, Chaukhambha Sanskrit Bhavan, Varanasi. P: 470

Acharya Priyavrata Sharma, and Dr. Guruprasada Sharma, Kaiyadeva Nighantu, Ghrita varga, reprint edition 2009, Chaukhambha Orientalia, Varanasi. P: 367, 368

Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 73

Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 177

Vaidya Laksmipati Sastri,Yogaratnakara, with Vidyotini hindi commentary, edition reprint 2008, Chaukhambha Prakashan, Varanasi. P: 105

112 composition of ghee [Internet]. [cited 2022 Apr 22]. Available from: http://www.ancientorganics.com/articles.htm

113 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 166

Shabdakalpadruma by Raja Radhakanta Deva, Chaukhambha Sanskrit Series, Varanasi, 3rd edition, 1967. Part 2 P : 395

Ravidutta Tripathi Shrimad Vriddha Vagbhatacharya krita Ashtanga Sangraha, saroj hindi commentary, reprint 2003, chaukhambha Sanskrit Pratishthan Delhi, P: 102

Shri Brahmashankara Mishra and Sri Rupalalji Vaisya, Bhavaprakasha of Sri Bhava Mishra, edited with Vidyotini hindi commentary, 11th edition, 2007, part 1, Chaukhambha Sanskrit Bhavan, Varanasi. P: 470

Acharya Priyavrata Sharma, and Dr. Guruprasada Sharma, Kaiyadeva Nighantu, Ghrita varga, reprint edition 2009, Chaukhambha Orientalia, Varanasi. P: 367, 368

Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P:73

Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 177

Vaidya Laksmipati sastri,Yogaratnakara,with vidyotini hindi commentary, edition reprint 2008, Chaukhambha Prakashan, Varanasi. P: 105

Pandit Harihara Prasada Tripathi, Harita Samhita, chapter 8 ksheera varga, 2nd edition 2009,Chaukhambha Krishnadas Academy, Varanasi.P: 69

Prof. Premavati Tiwari, Maharshi Maricha Kashyapa's Upadesha wriiten by Acharya Jeevaka's Kashyapa Samhita, Sutra Sthana, chapter 22, reprint 2002, Chaukhambha Vishwabharati, Varanasi. P: 22

114 Shabdakalpadruma by Raja Radhakanta Deva, Chaukhambha Sanskrit Series, Varanasi, 3rd edition, 1967. Part 2 P : 395

115 Shabdakalpadruma by Raja Radhakanta Deva, Chaukhambha Sanskrit Series, Varanasi, 3rd edition, 1967. Part 2 P : 790

116 Shabdakalpadruma by Raja Radhakanta Deva, Chaukhambha Sanskrit Series, Varanasi, 3rd edition, 1967. Part 2 P : 790

117 Shabdakalpadruma by Raja Radhakanta Deva, Chaukhambha Sanskrit Series, Varanasi, 3rd edition, 1967. Part 2 P : 790

118 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 514

119 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 399

120 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 514

121 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 10

122 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 197

123 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 250

124 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 251

125 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 175

126 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 176

127 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 176

128 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 181

129 Shabdakalpadruma by Raja Radhakanta Deva, Chaukhambha Sanskrit Series, Varanasi, 3rd edition, 1967. Part 4 P : 99

130 Ayurvedacharya Venee Madhava shastri Joshi and Ayurveda Visharada Narayana Hari joshi, Ayurvediya Shabdakosha, prathama khanda, 1968, Maharashtra rajya sahitya and samskriti mandal, Mumbai,P: 673

131 Pandit Parasurama satri, Vidyasagar, Pandit sarngadharacharya 's sarngadhara samhita, prathama khanda, Chaukhambha orientalia, Varanasi, 4th edition, 2000, P: 68

132 Amarakosh of Amarasimha, with the Commentary Vyakhyasudha or Rāmāsrami of Bhanuji Diksita, 2nd edition, Chaukhamba Sanskrit Pratishthan, Delhi, 1987. P: 40

133 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 175

134 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 515

135 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 46

136 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 174

137 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 402

138 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 514

139 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:514

140 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 51

141 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:516

142 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 50

143 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:339

144 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 56

145 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 52

146 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 46

147 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 70

148 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 27

149 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 50

150 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 62

151 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:278

152 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 183

153 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 43

154 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:103

155 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 185

156 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 179

157 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 179

158 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:339

159 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P:250

160 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 251

161 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 72

162 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 72

163 Arthur C. Guyton, John E. Hall, Textbook of Medical Physiology 11th edition, Saunders imprint of Elsevier, New Delhi, P: 292

164 Arthur C. Guyton, John E. Hall, Textbook of Medical Physiology 11th edition, Saunders imprint of Elsevier, New Delhi, P: 293

165 Arthur C. Guyton, John E. Hall, Textbook of Medical Physiology 11th edition, Saunders imprint of Elsevier, New Delhi, P: 191

166 Sujith. K.Chaudhuri, Concise Medical Physiology, 5th edition, New Central Book Agency (P) Ltd, Calcutta, P:19

167 Taber's Cyclopedic Medical dictionary edition 19, Jaypee Brothers Medical Publishers(P) Ltd, New Delhi, P: 1958.

168 Sujith. K.Chaudhuri, Concise Medical Physiology, 5th edition, New Central Book Agency (P) Ltd, Calcutta, P:19

169 Ramnik Sood , Medical Laboratory Technology 5th edition, reprint 2006, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 415

170 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 83-93

171 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 83-93

172 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 83-93

173 Gerard. J. Tortora, Bryan H. Derrickson, Principles of Anatomy and Physiology, 12th edition, volume 2, John Wiley & Sons, Inc. P -990 - 993

174 Gerard. J. Tortora, Bryan H. Derrickson, Principles of Anatomy and Physiology, 12th edition, volume 2, John Wiley & Sons, Inc. P -990 - 993

175 Types of fatty acids [Internet]. [cited 2022 Apr 22]. Available from: https://en.wikipedia.org/wiki/Fatty_acid

176 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 83-93

177 Types of fatty acids [Internet]. [cited 2022 Apr 22]. Available from: https://en.wikipedia.org/wiki/Fatty_acid

178 Omega 9 fatty acids [Internet]. [cited 2022 Apr 22]. Available from: https://en.wikipedia.org/wiki/Omega-9_fatty_acid

179 Arthur C. Guyton, John E. Hall, Textbook of Medical Physiology 11th edition, Saunders imprint of Elsevier, New Delhi, P: 846, 847

180 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 169 - 183

181 Gerard. J. Tortora, Bryan H. Derrickson, Principles of Anatomy and Physiology, 12th edition, volume 2, John Wiley & Sons, Inc. P -990 - 993

182 Gerard. J. Tortora, Bryan H. Derrickson, Principles of Anatomy and Physiology, 12th edition, volume 2, John Wiley & Sons, Inc. P -990 - 993

183 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 147 - 168

184 Arthur C. Guyton, John E. Hall, Textbook of Medical Physiology 11th edition, Saunders imprint of Elsevier, New Delhi, P: 804

185 Arthur C. Guyton, John E. Hall, Textbook of Medical Physiology 11th edition, Saunders imprint of Elsevier, New Delhi, P: 804

186 Arthur C. Guyton, John E. Hall, Textbook of Medical Physiology 11th edition, Saunders imprint of Elsevier, New Delhi, P: 804

187 Cyril.A. Keele, Eric Neil, and Norman Joels, Samson Wright's Applied Physiology, 13th edition, Oxford university press, New Delhi, P: 458-461

188 Arthur C. Guyton, John E. Hall, Textbook of Medical Physiology 11th edition, Saunders imprint of Elsevier, New Delhi, P: 842

189 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 83-93

190 Cyril.A. Keele, Eric Neil, and Norman Joels, Samson Wright's Applied Physiology, 13th edition, Oxford university press, New Delhi, P: 458-461

191 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

192 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

193 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

194 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

195 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

196 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

197 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

198 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

199 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

200 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

201 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

202 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

203 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

204 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

205 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 168 - 183

206 Sujith. K.Chaudhuri, Concise Medical Physiology, 5th edition, New Central Book Agency (P) Ltd, Calcutta, P: 359

207 Human Subjects Research Design - StatPearls - NCBI Bookshelf [Internet]. [cited 2022 Apr 22]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK537270/

208 K. Park, Park's Textbook of Preventive and Social Medicine, 26th edition, M/s Banarsidas BhanotPublishers, Pune, P: 703

209 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 57

210 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 183

211 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 185

212 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 278

213 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 179

214 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 278

215 WHOQOL - Files| The World Health Organization [Internet]. [cited 2022 Apr 22]. Available from: https://www.who.int/tools/whoqol/whoqol-bref

216 Agriculture Marketing [Internet]. [cited 2022 Apr 22]. Available from: https://agmarknet.gov.in/

217 Harvard Step Test [Internet]. [cited 2022 Apr 21]. Available from: https://www.topendsports.com/testing/tests/step-harvard.htm

218 WHOQOL - Files| The World Health Organization [Internet]. [cited 2022 Apr 22]. Available from: https://www.who.int/tools/whoqol/whoqol-bref

219 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Siddhi sthana, Chaukhamba Surbharati Prakashan, Varanasi,Reprint edition, 2008, P: 678

220 Pandit Parasurama satri, Vidyasagar, Pandit sarngadharacharya ‘s sarngadhara samhita, prathama khanda, Chaukhambha orientalia, Varanasi, 4th edition, 2000, P: 46

221 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 243

222 Ganguli NC, Jain MK. Ghee: Its Chemistry, Processing and Technology. J Dairy Sci. 1973 Jan 1;56(1):19–25.

223 Ullah R, Khan S, Ali H, Bilal M, Saleem M. Identification of cow and buffalo milk based on Beta carotene and vitamin-A concentration using fluorescence spectroscopy. PLoS One [Internet]. 2017 May 1 [cited 2022 Apr 22];12(5). Available from: /pmc/articles/PMC5436857/

224 Dr.Vidyadhar Shukla, Padartha Vignana Darpana, Chaukhambha Surbharati Prakashan, Varanasi, printed 1998, P: 323,324

225 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 148

226 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 150

227 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 73

228 FPT 112: 13.1.4.1.Basal Metabolic Rate- BMR [Internet]. [cited 2022 Apr 22]. Available from: http://ecoursesonline.iasri.res.in/mod/page/view.php?id=39293

229 Recommended Daily Fat Intake [Internet]. [cited 2022 Apr 22]. Available from: https://www.infoplease.com/math-science/health/fitness-nutrition/recommended-daily-fat-intake

230 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 12

231 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 79

232 Paradakara Hari Shivadasa Shastri, Ashtanga Hridaya of Vagbhata, Sarvanga Sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprint edition, 2007, P: 186

233 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 82

234 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 332

235 Shabdakalpadruma by Raja Radhakanta Deva, Chaukhambha Sanskrit Series, Varanasi, 3rd edition, 1967. Part 2 P : 395

236 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 182

237 DM Vasudevan, Sreekumari S, & Kannan Vaidyanathan, Textbook of Biochemistry, 7th edition, Jaypee brothers Medical Publishers (P) Ltd, New Delhi, P: 149

238 Sujith. K.Chaudhuri, Concise Medical Physiology, 5th edition, New Central Book Agency (P) Ltd, Calcutta, P:368

239 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 516

240 Vaidya Laksmipati sastri,Yogaratnakara,with vidyotini hindi commentary, edition reprint 2008, Chaukhambha Prakashan, Varanasi. P: 316

241 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 236

242 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 88

243 V. V. Subrahmanya Sastri Tridosha Theory, 4th edition 2002, Arya Vaidya Sala, Kottakkal, Kerala. P: 125

244 Kaviraja Ambikadutta Shastri, Sushruta Samhita of Maharshi Sushruta, Ayurveda Tattva Sandipika, Hindi Commentary, Shareera Stahana, edition reprint 2007, Chaukhamba Sanskrit Sansthan Varanasi. P: 28

245 Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, Chaukhamba Surbharati Prakashan, Varanasi, Reprint edition, 2008, P: 236

STUDY OF SNIGDHAM ASHNEEYAAT WITH THE INTERVENTION OF GOGHRITA (COW'S GHEE) IN RELATION TO THE STATUS OF RASA DHATU AND LIPID PROFILE

INTRODUCTION

Food is considered as prana[1] or vital force for which all the living beings aspire. Anything which fills up the stomach to free from hunger cannot be called as food. Food should constitute colour, smell, taste & touch according to the likings of that person & it should be consumed according to the rules and regulations for taking food[2] as said in Ayurveda classics, only then the person gets the benefits. Food provides colour and complexion, happiness, mental satisfaction, nourishment, strength, memory[3] etc. Presence of all these qualities in food serves the purpose of consuming it.

Ghee is considered to be an integral part of the human diet in India since ages. Rate of consumption varies according to region, and individuals. Ghee has good nutritious and therapeutic value. Ayurveda suggests the use of cow's ghee as best among other ghees[4].

Every food item we consume encounters with agni and results in the formation of ahara rasa and thus rasa dhatu. Even the ghee consumed will be making an entry in to the rasa dhatu thus circulating all over the body.

Rasa which is considered as the aadya dhatu continuously circulates and forms the aadhara for nourishment of consecutive shad dhatus. It circulates along with rakta dhatu all throughout the body[5].

Blood is said to be the basic component in the formation of life. It is responsible for the maintenance and survival of a human life. Blood consists of plasma and cells (red cells, white cells and platelets) [6]. The ubiquitous distribution of blood in the body and its exclusive chemical characteristics make it a most efficient transport system.

Serum[7] refers to blood plasma from which clotting factors (such as fibrin) have been removed. It resembles whey in appearance (transparent with a faint straw

colour). Serum is mainly composed of water, blood proteins and inorganic electrolytes. It serves as transport medium for glucose, lipids, amino acids, hormones, metabolic end products, carbon dioxide and oxygen.

Lipid profile[8] is a panel of blood tests that serves as an initial broad medical screening tool for abnormalities in lipids, such as cholesterol and triglycerides.

The current study is an effort to explore the effects of goghrita on rasa dhatu keeping bio chemical changes in lipid values as a parameter.

Need for study:

The general public are well aware of health risk factors because of the vast information available through media and internet. They know about the familial risk factors for diabetes mellitus, obesity and cardiovascular disorders thus, they totally avoid intake of ghee.

In Ayurveda it has been said that goghrita is one of the nitya sevaneeya aahara dravya. The rule for consumption of ahara is "snigdham ashneeyaat"[9]

This process of consuming ghrita along with bhojana is fading out leading to increase in rukshata inturn leading to vata vruddhi which may have manifold implications on various aspects of health of the individual, ultimately reducing the quality of life. But, recent advancements in the research field recommend the low fat diet which is contradictory to the recommendations of Ayurveda.

There is a dilemma between these recommendations about consumption of ghee.

Hence such a condition necessitated the study of ghee's effect on the dhatus. As rasa dhatu is the foremost dhatu which nourishes other dhatus, also, effect of ghrita over rasa dhatu is to forms the vishuddhatara dhatu or pratyagra dhatu[10]. Therefore it has been selected for the study.

Review of literature:

Goghrita is considered as best among the jangama sneha's. It promotes smriti, buddhi, agni, shukra and ojas. It is rasayana and chakshu hita. Ghrita alleviates vata

due to its snigdha (unctuous) guna, and pitta due to its maduhra (sweetness) and sheeta (coldnesss). It has cooling and softening effect, provides clarity of the voice, and improves complexion.[11] The study of goghrita with its matra, guna, karma etc, and the details of edible fats, daily requirement of fats for adults etc will be done in detail.

Rasa dhatu is the one which does preenana of whole body. Though hrudaya is said to be the sthana, it continuously circulates throughout the body in all directions[12].

Blood consists of plasma and cells (red cells, white cells and platelets). It is primarily a medium for the carriage of Oxygen, nutrient materials, hormones and antibodies to the tissues and for the removal of Carbon dioxide and other waste products from the tissues and their elimination from the body. Blood plasma is the liquid component of blood in which the blood cells are suspended. Serum refers to blood plasma from which clotting factors (such as fibrin) have been removed. **[13]**

Serum resembles whey in appearance (transparent with a faint straw colour). It is mainly composed of water, blood proteins and inorganic electrolytes. It serves as transport medium for glucose, lipids etc. Its protein content is necessary to maintain the oncotic pressure of the blood which "holds" the serum within the vessels. The Serum consits of **[14]**Albumin, Globulin, Cholesterol, Triglycerides, Lipase, Lipoprotein, Glucose, Myoglobin, Insulin, Sodium, Urea, Creatinine, Uric acid, Zinc etc.

The lipid profile is a blood test done to assess the status of fat metabolism in the body. This includes measuring lipids and its derivatives known as lipoproteins. Lipoproteins are compounds containing fat and proteins and include free cholesterol, cholesterol esters, triglycerides, phospholipids and Apo proteins.

The study of blood, serum and lipids present in serum will be done in detail.

REVIEW OF PREVIOUS WORK DONE

1. Pharmacological study of cream based and curd based goghrita w.s.r to lipid profile by Tank Sharada, Department of Dravya Guna, NIA, Jaipur 2002

2. Study of 'snigdham ashneeyaat' in relation with ahara pachana kriya by Anuja Kanade Department Of Kriya Shareera, Hadapsar, Pune 2010

3. Effect of dietary ghee - the anhydrous milk fat, on blood and liver lipids in rats by Matam Vijaya Kumar The Journal of Nutritional Biochemistry, Volume 10, Issue 2, February 1999, Pages 96–104 in 1999

4. Rasagata sneha (cholesterol) ka naidanika evam chikitsatmaka adhyayana by Majumdar Dattatraya B, Department of Kayachikitsa, Mumbai 1990

5. A study on snehapana with special emphasis on lipid profile by Anand P K V Department of Kayachikitsa and Panchkarma, Trivandrum 1998

Taking a glance on the previous work done mentioned above, there are no efforts towards understanding the effects of goghrita on rasa dhatu keeping lipid profile as a parameter.

AIM

- To analyze the effect on the status of rasa dhatu & lipid profile after intervention of goghrita (cow's ghee) as a dietary ingredient.

HYPOTHESIS:

Null Hypothesis

1. There is no effect of snigdham ashneeyat (goghrita) on the status of rasa dhatu with respect to its karma, vriddhi, kshaya, and sarata.

2. There is no effect of dietary goghrita on the parameters of lipid profile such as Total Cholesterol, Triglycerides, HDL, LDL, VLDL.

Alternate Hypothesis

1. There is effect of snigdham ashneeyat (goghrita) on the status of rasa dhatu with respect to its karma, vriddhi, kshaya, and sarata.

2. There is effect of dietary goghrita on the parameters of lipid profile such as Total Cholesterol, Triglycerides, HDL, LDL, VLDL.

MATERIALS

- ***Literary study***: References from various Ayurvedic classics, other ancient texts, and texts of modern physiology, reputed journals, articles and suitable websites which are relevant will be collected.

- ***Interventional study***: Individuals fulfilling inclusion criteria of either sex will be collected for the study. A detailed proforma will be prepared in order to collect various relevant details which are necessary for the assessment. The outcome will be based on the findings of these assessments

- ***Ghrita*** used in the study will be collected from a standardized diary product's firm.

- ***Study center*****:** Sri Sri College of Ayurvedic Sciences and Research, Bangalore.

- ***Study population*****:** Individuals for the study will be recruited from various institutions run by SSRVM trust in Bangalore.

METHODS:

A. Sample size: 100**.**

The individuals will be divided into 2 group**s –** each group consisting of 50 individuals.

B. Inclusion Criteria:

- Individuals having normal lipid profile.
- Both sexes.
- Age group-20-40 yrs.
- As mentioned in the classics only ghrita sevanarha persons will be included in the study.

C. Exclusion Criteria:

1) Individuals with the history of any systemic disorders which affect fat metabolism.
2) Individuals taking internal medication which affects fat metabolism.
3) Women who are consuming oral contraceptive pills.
4) Pregnant and lactating women.
5) Alcoholics and smokers.

D. Research Design:

It is an interventional trial. Individuals following inclusion criteria will be selected by judgment sampling method for the study *after taking informed consent*. Total number of individuals will be randomly divided into two groups (using simple random sampling table method), each group containing 50 individuals.

Group A: will be given warm and liquid goghrita with meals in 2 divided doses.

Group B: will be considered as control group.

Goghrita will be provided for **30 days** at the dose of **18 gms per day**[15]. All investigations, rasa dhatu pareekshana, and agni pareekshana will be carried out, before and after the study.

[In order to prevent bias in the study, the control group will not be made known of the study details. To maintain uniformity in the diet pattern, a simple diet chart will be given to individuals participating in both the groups]

Statistical model assumed

Logistic regression

Logistic regression is one of the most commonly-used statistical techniques. It is used with data in which there is a binary (success-failure) outcome (response) variable, or where the outcome takes the form of a binomial proportion. Logistic regression measures the relationship between a categorical dependent variable and one or more independent variables, which are usually (but not necessarily) continuous, by using probability scores as the predicted values of the dependent variable. In logistic regression, however, one estimates the probability that the outcome variable assumes a certain value, rather than estimating the value itself. Logistic regression provides a method for modeling a binary response variable, which takes values 1 and 0.

E. Diagnostic and Assessment criteria:

1. **The subjective parameters include –**

i. Rasa dhatu karma[16]
ii. Rasa vriddhi lakshana[17],
iii. Rasa kshaya lakshana[18],
iv. Twak sara lakshana[19],
v. Rasa pradoshaja vikara[20] will be considered.

Rasa dhatu karma

Sl.No	Signs and Symptoms	Present	Absent
1	Tushti		
2	Preenana		
3	Rakta pushti		

Rasa vriddhi lakshana

Sl.No	Signs and Symptoms	Present	Absent
1	Agni sada		
2	Praseka		
3	Alasya		
4	Gourava		
5	Shwaitya		
6	Shaitya		
7	Anga shaithilya		
8	Shwasa		
9	Kasa		
10	Atinidra		

Rasa kshaya lakshana

Sl.No	Signs and Symptoms	Present	Absent
1	Rouksya		
2	Shrama		
3	Shosha		
4	Glani		
5	Shabda asahishnuta		

Twak sara lakshana

Sl.No	Signs and Symptoms	Present	Absent
1	Snigdha		
2	Shlakshna		
3	Mridu		
4	Prasanna		
5	Sukshma		
6	Alpa		
7	Gambheera		
8	Sukumara loma		
9	Prabha		

Rasa pradoshaja vikara

Sl.No	Signs and Symptoms	Present	Absent
1	Ashraddha		
2	Aruchi		
3	Aasya vairasya		
4	Arasagnata		
5	Hrillasa		
6	Gourava		
7	Tandra		
8	Angamarda		
9	Jwara		
10	Tama		
11	Pandutwa		
12	Srotorodha		
13	Klaibhya		
14	Sada		
15	Krishanga		
16	Agni nasha		
17	Vali		
18	Palita		

Questionnaires will be prepared for the assessment of all these subjective parameters.

2. **The objective parameters include ---**

    a. Total Cholesterol
    b. Triglycerides
    c. H.D.L.
    d. L.D.L. and
    e. V.L.D.L.

Research methodology – The methodology used will be ‘cohort clinical trial’.

Statistical analysis:

Scoring will be given to subjective findings. The data collected will be subjected to statistical analysis through “paired t test”, “logistic regression” and other tests as per requirement.

Ethical clearance: Ethical clearance will be taken from the Ethical committee.

Result assessment:

Results will be assessed based on the observations; the changes will be observed based on subjective findings as well as objective parameters.

Discussion:

Discussion will be based on the literary research made on the concepts, relevant observations of the study and the results obtained.

Conclusion:

The conclusion of the study will be drawn based on discussion.

Bibliography:

1. Sushruta Samhita with Nibandha Sangraha commentary by Dalhana Acharya Published by choukamba orientalia, Varanasi, 6th edition: 1997.

2. Park's texebook of Preventive and Social medicine by K.Park, published by Banarasidas Bhanot publishers, Jabalpur, 18th edition 2005.

3. Astanga Sangraha by Vagbhata with shasilekha commentary translated by prof. K R Srikantha murthy published by choukhamba orientalia, Varanasi, 8th edition 2004

4. Charaka Samhita with the commentary 'Ayurveda dipika' by Chakrapanidatta published by choukhamba Surabharati prakashana, Varanasi, 4th edition.

5. Agnivesha's Charaka Samhita, Commentary Chakrapanidatta edited by Dr. Ram Karan Sharma & Vaidya Bhagavan Das, Chaukhambha Sanskrit Series, Varanasi, 6th Editon 1999.

6. Charaka Samhita - Vidyotini Hindi Commentary, Dr. Kashinath Shastri and Dr. Gorakhnath Chaturvedi, Chaukhambha Bharati Academy, Varanasi.

7. Vagbhata's Ashtanga Hridayam translated by Prof. K. R. Srikantha Murthy, Krishnadas Academy, Varanasi, 5th Edition 2001.

8. Text book of biochemistry by D.M.Vasudevan and Sreekumari.S second edition, Jaypee Brothers Medical Publishers (P) Ltd

9. Harrison's principles of internal medicine, Volume-2,

Signature of the Scholar
Dr. Varuni. S. J
Assisstant Professor,
Sri Sri College of Ayurvedic Science and Research, 21st KM, Kanakapura road,
Udayapura post, Bangalore – 560082
Phone – 080 – 41425577 ® 09483522044 (M)

CASE RECORD FORM

Title: Study of Snigdham Ashneeyaat with the intervention of Goghrita (cow's ghee) in relation to the status of Rasa dhatu and Lipid profile

Name of Investigator: Dr. Varuni.S.J
Guide: Dr. Kalpana D Sathe

I. Preliminary data:

Name:
Age: -------Years.
Sex: 1) Male 2) Female
Religion: 1) Hindu 2) Muslim 3) Christian 4) Others.
Rutu : …….. Desha …… Kala …….
Marital status: 1) Married 2) Unmarried.
Educational status: 1) Illiterate 2) Primary education 3) Secondary education
4) Under Graduate 5) Graduate 6) Post Graduate
Occupation: ……
Address:

II. **Personal data**:

AHARA:

Diet: 1) Veg 2) Mixed
Frequency (times/day) 1) <4 2) 4 3) >4 4) Not fixed
Nonveg. diet consumption: times/month
Appetite: 1) Poor 2)Moderate 3) Good

	1) Yes	2) No	Amounts /Day
Staple			
Vegetables			
Fruits			
Dairy products			
Fried food stuffs			
Fish			
Beef			
Mutton			
Chicken			
Desserts			
Ice cream			
Fruit salad			
Chocolate pudding			
Custard			
Yogurt			
Cake			

Habit of bakery food:	1) Yes	2) No	Amounts /Day
Puff			
Condiments			
Burger			
Chats			
Pizza			
Chips			
Toast			
Bread			

Drinks:	1) Yes	2) No	No. of times / day	Hot / Cold	Quantity
Tea					ml
Coffee					ml
Milk					ml
Juice					ml
Soft drinks					ml

Intake of water 1) Cold 2) Lukewarm 3)Boiled 4) Unboiled

Quantity 1) <2 2) 2-4 3) >4 4) Not fixed
(liters/day)

Mode of preparation of food

Cooked Uncooked Fried Fast food

Oil used

Sunflower Coconut Ground nut
Ghee Palm oil Others

VIHARA

Exercise 1) Yes 2) No
Type 1) Mild 2) Moderate 3) Heavy
Hours ……. /week
Sleep 1) Disturbed 2) Undisturbed
Night sleep: 1) Yes 2) No
Hours/night 1) <6hrs 2) 6hrs 3) >6hrs 4) Not fixed
Day sleep 1) Yes 2) No
Hours/day 1) <1hr 2) 1hr 3) >1hr 4) Not fixed 5) No sleep

Bowel Habit: 1) Regular 2) Irregular
Nature 1) Formed 2) Loose 3) Constipated
Frequency (times/day) 1) Once 2) Twice 3) Thrice 4) >3 times
Micturition:
Quantity 1) Normal 2) Scanty 3) Excessive

Frequency (times/day) 1) <4 2) 4 3) >4 4) Not fixed

.

Menstrual History:

Interval	1) Regular	2) Irregular		
Pain	1) Yes	2) No		
Quantity	1) Normal	2) Scanty	3) Excess	
Days	1) <3	2) 3-4	3) 5-7	4) >7

Professional History

1) Sedentary work
2) Involve physical strain
3) Sedentary involves mental strain
4) Both physical and mental strain

Since …….. Years

Working hours …….. Hours/day

Emotional status:	1) Yes	2) No
1) Anxious		
2) Depressive		
3) Sentimental		
4) Jolly		
5) Irritable		
6) Aggressive		
7) Normal		

III. Habits / Addictions

Sl. No	**Types**	1) Yes	2) No	Quantity/ Frequency/Day
1.	Beedis			
2.	Cigarettes			
3.	Alcohol			
4.	Tobacco chewing			
5.	Tobacco snuffs			
6.	Beetle chewing			

IV. <u>GENERAL PHYSICAL EXAMINATION:</u>

VITAL SIGNS:

Pulse rate /min
B.P /mmHg
Temperature ^{0}F.
Heart rate /min
Respiratory rate /min.

OTHER SIGNS:

Built and nourishment 1) Well 2) Moderate 3) Poor
Height: …….cms.
Weight: BT AT

V. SYSTEMIC EXAMINATION

Cardio Vascular System	BT	AT
Pulse rate	……../min	……../min
B.P	……../mm of Hg	……../mm of Hg
Heart rate	……../min	……../min
Heart sounds		
Harvard step test		

Digestive System
Inspection
Palpation
Percussion
Auscultation

VI. DASHAVIDHA PAREEKSHA

Prakriti:	1) V	2) P	3) K	4) VP	5) VK	6) PK	7) VPK
Vikriti:	1) Yes	2) No					
Sara:	1) Pravara	2) Madhyama	3) Avara				
Samhanana:	1) Pravara	2) Madhyama	3) Avara				
Pramana:	1) Sthula	2) Krisha	3)Madhyama				
Satmya:	1) Pravara	2) Madhyama	3) Avara				
Satwa:	1) Pravara	2) Madhyama	3) Avara				
	1) Pravara	2) Madhyama	3) Avara				
Ahara shakti:							
Abhyavaharana	1) Pravara	2) Madhyama	3) Avara				
shakti	1) Pravara	2) Madhyama	3) Avara				
Jarana shakti: Agni	1) Sama	2) Vishama	3) Manda	4)Tikshna			
Koshtha	1) Mridu	2) Madhyama	3) Kroora				
Vyayama Shakti:	1) Pravara	2) Madhyama	3) Avara				
Vaya:	1) Bala	2) Madhyama	3) Vriddha				

VII. Assessment of Rasa dhatu and Lipid profile

Rasa dhatu karma

Sl.No	Signs and Symptoms	Present	Absent	Present	Absent
1	Tushti				
2	Preenana				
3	Rakta pushti				

Rasa vriddhi lakshana

Sl.No	Signs and Symptoms	Present	Absent	Present	Absent
1	Agni sada				
2	Praseka				
3	Alasya				
4	Gourava				
5	Shwaitya				
6	Shaitya				
7	Anga shaithilya				
8	Shwasa				
9	Kasa				
10	Atinidra				

Rasa kshaya lakshana

Sl.No	Signs and Symptoms	Present	Absent	Present	Absent
1	Rouksya				
2	Shrama				
3	Shosha				
4	Glani				
5	Shabda asahishnuta				

Twak sara lakshana

Sl.No	Signs and Symptoms	Present	Absent	Present	Absent
1	Snigdha				
2	Shlakshna				
3	Mridu				
4	Prasanna				
5	Sukshma				
6	Alpa				
7	Gambheera				
8	Sukumara loma				
9	Prabha				

Rasa pradoshaja vikara

Sl.No	Signs and Symptoms	Present	Absent	Present	Absent
1	Ashraddha				
2	Aruchi				
3	Aasya vairasya				
4	Arasagnata				
5	Hrillasa				
6	Gourava				

7	Tandra				
8	Angamarda				
9	Jwara				
10	Tama				
11	Pandutwa				
12	Srotorodha				
13	Klaibhya				
14	Sada				
15	Krishanga				
16	Agni nasha				
17	Vali				
18	Palita				

LAB INVESTIGATIONS

TESTS	**BT**	**AT**
Cholesterol		
Triglycerides		
HDL		
LDL		
VLDL		

Signature of Investigator Signature of Guide

AGNI PAREEKSHA

Sl .no	Lakshana	Before trial	After trial	At the end of 1 month		
				Same	Reduced	Improved
1	Abhyavaharana shakti					

Jeerna lakshanas

Sl .no	Lakshana	Before trial		After trial		At the end of 1 month		
		Present	Absent	Present	Absent	Same	Reduced	Improved
1	Udgara shuddhi							
2	Utsaha							
3	Malotsarjana							
4	Mutrotsarjana							
5	Laghuta							
6	Developing hunger							
7	Developing thirst							

Benefits of snigdha bhojana

Sl .no	Lakshana	Before trial		After trial		At the end of 1 month		
		Present	Absent	Present	Absent	Same	Reduced	Improved
1	Bhujyamanam swadate							
2	Agni udeerana							
3	Kshipra jara							
4	Vatanulomana							
5	Shareera upachaya							
6	Indriya dardhya							
7	Increases bala							
8	Increases varna							

GHRITA SEVANA ARHA AND ANARHA PERSONS

Sevana Arha

Sl.no	Arha	Present	Absent
1	Swedya		
2	Samshodhya		
3	Madya asakta		
4	Stree asakta		
5	Vyayama asakta		
6	Chintaka		
7	Vriddha		
8	Bala		
9	Abala		
10	Krisha		
11	Rooksha		
12	Kshneena rakta		
13	Ksheena retas		
14	Vata peedita		
15	Syanda (akshi rogayukta)		
16	Timira		
17	Krichra unmeelana		

Sevana Anarha

Sl.no	Arha	Present	Absent
1	Ati mandagni		
2	Ati teekshnagni		
3	Sthula		
4	Durbala		
5	Urustambha		
6	Atisara		
7	Ama		
8	Gala roga		
9	Gara visha		
10	Udara roga		
11	Murcha		
12	Chardi		
13	Aruchi		
14	Shleshma peedita		
15	Trishna peedita		
16	Madya peedita		
17	Apaparasuta		
18	Undergoing Nasya		
19	Undergoing Basti		
20	Undergoing Virechana		

Rakta Saara Lakshana

Sl. no	Signs and symptoms	Before trial		After trial	
		Present	Absent	Present	Absent
1.	Snigdha and rakta varna of karna				
2.	Snigdha and rakta varna of Akshi				
3.	Snigdha and rakta varna of Mukha				
4.	Snigdha and rakta varna of Jihwa				
5.	Snigdha and rakta varna of Nassa				
6.	Snigdha and rakta varna of Oshtha				
7.	Snigdha and rakta varna of Panitala				
8.	Snigdha and rakta varna of Padatala				
9.	Snigdha and rakta varna of Nakha				
10.	Snigdha and rakta varna of lalata				
11.	Snigdha and rakta varna of Mehana				
12.	Shobhayukta				

WHO Quality of Life Assessment Questionnaire

The following questions ask how you feel about your quality of life, health, or other areas of your life. Read each question along with the response options. **Please choose the answer that appears most appropriate.** If you are unsure about which response to give to a question, the first response you think of is often the best one.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last four weeks.**

		Very poor	Poor	Neither poor nor good	Good	Very good
1	How would you rate your quality of life?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2.	How satisfied are you with your health?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	An extreme amount
3.	To what extent do you feel that physical pain prevents you from doing what you need to do?	5	4	3	2	1
4.	How much do you need any medical treatment to function in your daily life?	5	4	3	2	1
5.	How much do you enjoy life?	1	2	3	4	5
6.	To what extent do you feel your life to be meaningful?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	Extremely
5	How well are you able to concentrate?	1	2	3	4	5
6	How safe do you feel in your daily life?	1	2	3	4	5
7	How healthy is your physical environment?	1	2	3	4	5

		Not at all	A little	Moderately	Mostly	Completely
8	Do you have enough energy for everyday life?	1	2	3	4	5
9	Are you able to accept your bodily appearance?	1	2	3	4	5
10	Have you enough money to meet your	1	2	3	4	5

	needs?					
11	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
12	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

		Very poor	Poor	Neither poor nor good	Good	Very good
13	How well are you able to get around?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
14	How satisfied are you with your sleep?	1	2	3	4	5
15	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
16	How satisfied are you with your capacity for work?	1	2	3	4	5
17	How satisfied are you with yourself?	1	2	3	4	5
18	How satisfied are you with your personal relationships?	1	2	3	4	5
19	How satisfied are you with your sex life?	1	2	3	4	5
20	How satisfied are you with the support you get from your friends?	1	2	3	4	5
21	How satisfied are you with the conditions of your living place?	1	2	3	4	5
22	How satisfied are you with your access to health services?	1	2	3	4	5
23	How satisfied are you with your transport?	1	2	3	4	5

		Never	Seldom	Quite often	Very often	Always
24	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	5	4	3	2	1

[The following table should be completed after the interview is finished]

Before Trial

	Equations for computing domain scores	Raw cores	Transformed scores	
			4 -20	0-100
Domain 1	Q8 + Q13 + Q14 + Q15 + Q16			
Domain 2	Q3 + Q4 + Q5 + Q9 + Q17+ (6-Q24)			
Domain 3	Q18 + Q19 + Q20			
Domain 4	Q6 + Q7 + Q10 + Q11 + Q12 + Q21 + Q22 + Q23			

After Trial

	Equations for computing domain scores	Raw cores	Transformed scores	
			4 -20	0-100
Domain 1	Q8 + Q13 + Q14 + Q15 + Q16			
Domain 2	Q3 + Q4 + Q5 + Q9 + Q17+ (6-Q24)			
Domain 3	Q18 + Q19 + Q20			
Domain 4	Q6 + Q7 + Q10 + Q11 + Q12 + Q21 + Q22 + Q23			

CONSENT FORM

Name of the Patient: _____
Name of the Physician: Dr. Varuni S.J.
Name of the Institution: Sri Sri College of Ayurvedic Science and Research Hospital, Bengaluru.

The Informed Consent

I, _____, have read the information in this form (or it has been read to me). I was free to ask any questions and they have been answered. I am over 18 years of age, exercising my free power of choice, hereby give my consent to be included as a patient for **"Study of Snigdham Ashneeyaat with the intervention of Goghrita (Cow's Ghee) in relation to the status of Rasa Dhatu and Lipid Profile"**

1. I have read and understood this consent form and the information provided to me.
2. I have had the consent document explained to me.
3. I have been explained about the nature of the treatment.
4. My responsibilities have been explained to me by the investigator.
5. I have been advised about the risks associated with the treatment(s)
6. I have informed the physician of all the treatments I am taking or have taken in the past month(s) including Allopathy, Ayurvedic, Homeopathic or any household treatments.
7. I agree to cooperate with the physician and I will inform him/her immediately if I suffer from unusual symptoms.
8. My identity will be kept confidential if my data is publicly presented.
9. I have had my questions answered to my satisfaction regarding expected results as well as unwanted effects of the procedure(s) / medication(s).

By signing this consent form, I attest that the information given in this documentation has been clearly explained to me and apparently understood by me. I will be given a copy of this consent document.

Patient's sign: _____ Name: _____

Place: _____ Date: _____ Time: _____

ಒಪ್ಪಿಗೆ ಪತ್ರ

ರೋಗಿಯ ಹೆಸರು:

ವೈದ್ಯರ ಹೆಸರು: ಡಾ. ವಾರುಣಿ ಎಸ್.ಜೆ.

ಸಂಸ್ಥೆಯ ಹೆಸರು: ಶ್ರೀ ಶ್ರೀ ಆಯುರ್ವೇದ ವೈದ್ಯಕೀಯ ಮಹಾವಿದ್ಯಾಲಯ ಮತ್ತು ಸಂಶೋಧನಾ ಆಸ್ಪತ್ರೆ, ಬೆಂಗಳೂರು.

ನಾನು _____.. ಈ ಪತ್ರದಲ್ಲಿರುವ ಮಾಹಿತಿಯನ್ನು ಓದಿರುತ್ತೇನೆ (ಅಥವಾ ಕೇಳಿ ತಿಳಿದುಕೊಂಡಿರುತ್ತೇನೆ).

ನನ್ನ ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಲು ನನಗೆ ಸಂಪೂರ್ಣ ಅವಕಾಶವಿದ್ದು, ಅವುಗಳಿಗೆ ಉತ್ತರ ಪಡೆದುಕೊಂಡಿರುತ್ತೇನೆ. ನನ್ನ ವಯಸ್ಸು ಹದಿನೆಂಟು (೧೮) ವರ್ಷಗಳನ್ನು ಮೀರಿದ್ದು, ನನ್ನ ಸ್ವ ಇಚ್ಛೆಯಿಂದ ಈ ಮೂಲಕ **"Study of Snigdham Ashneeyaat with the intervention of Goghrita (Cow's Ghee) in relation to the status of Rasa Dhatu and Lipid Profile"** ಎಂಬ ಅಧ್ಯಯನ ವಿಷಯಕ್ಕೆ ನನ್ನನ್ನು ರೋಗಿಯಾಗಿ ಪರಿಗಣಿಸಲು ನನ್ನ ಸಂಪೂರ್ಣ ಒಪ್ಪಿಗೆಯನ್ನು ಕೊಡುತ್ತಿದ್ದೇನೆ.

೧. ನಾನು ಈ ಒಪ್ಪಿಗೆ ಪತ್ರವನ್ನು ಓದಿ ತಿಳಿದುಕೊಂಡಿರುತ್ತೇನೆ ಹಾಗು ಮಾಹಿತಿಗಳನ್ನು ಪಡೆದುಕೊಂಡಿರುತ್ತೇನೆ.
೨. ನನಗೆ ಒಪ್ಪಿಗೆ ಪತ್ರದ ಬಗ್ಗೆ ವಿವರಿಸಲಾಗಿದೆ.
೩. ನನಗೆ ಚಿಕಿತ್ಸೆಯ ಸ್ವರೂಪವನ್ನು ವಿವರಿಸಲಾಗಿದೆ.
೪. ಸಂಶೋಧಕರು ನನಗೆ ನನ್ನ ಜವಾಬ್ದಾರಿಗಳನ್ನು ವಿವರಿಸಿದ್ದಾರೆ.
೫. ನನಗೆ ಈ ಚಿಕಿತ್ಸೆಯಿಂದ ಆಗಬಹುದಾದ ಅಪಾಯ/ತೊಂದರೆಗಳನ್ನು ತಿಳಿಸಲಾಗಿದೆ.
೬. ನಾನು ಈವರೆಗೆ ಒಳಗೊಂಡಿರುವ ಎಲ್ಲಾ ಚಿಕಿತ್ಸೆಗಳ ವಿವರಗಳನ್ನು ಸಂಶೋಧಕರಿಗೆ ತಿಳಿಸಿರುತ್ತೇನೆ (ಆಯುರ್ವೇದ, ಅಲೋಪಥಿ, ಹೊಮಿಯೋಪತಿ ಮತ್ತು ಇನ್ನಿತರೆ ಚಿಕಿತ್ಸೆಗಳು).
೭. ನಾನು ಈ ಚಿಕಿತ್ಸೆಗೆ ಸಹಕರಿಸಲು ಸಮ್ಮತಿಸುತ್ತಿದ್ದೇನೆ ಹಾಗು ಈ ಮಧ್ಯೆ ಯಾವುದಾದರೂ ಅಸಹಜ ಲಕ್ಷಣಗಳು ಕಂಡುಬಂದಲ್ಲಿ ತುರ್ತಾಗಿ ವೈದ್ಯರನ್ನು ಸಂಪರ್ಕಿಸುತ್ತೇನೆ.
೮. ನನ್ನ ಮಾಹಿತಿಯನ್ನು ಸಾರ್ವಜನಿಕವಾಗಿ ನಿರೂಪಿಸಿದ್ದಲ್ಲಿ, ನನ್ನ ಗುರುತನ್ನು ಗೌಪ್ಯವಾಗಿಡಬೇಕು.
೯. ಚಿಕಿತ್ಸೆಯ ನಿರೀಕ್ಷಿತ ಫಲಿತಾಂಶ ಮತ್ತು ದುಷ್ಪರಿಣಾಮಗಳ ಬಗ್ಗೆ ನನ್ನ ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳಿಗೂ ಸಮಾಧಾನಕರ ಉತ್ತರಗಳು ಸಿಕ್ಕಿವೆ.

ಈ ಒಪ್ಪಿಗೆ ಪತ್ರದ ಮೇಲೆ ರುಜು ಹಾಕುವ ಮುಖಾಂತರ, ಈ ದಾಖಲೆಯಲ್ಲಿರುವ ಎಲ್ಲಾ ಮಾಹಿತಿಗಳನ್ನು ನನಗೆ ವಿವರಿಸಲಾಗಿದೆ ಮತ್ತು ನಾನು ಅವುಗಳನ್ನು ಅರ್ಥೈಸಿಕೊಡಿರುತ್ತೇನೆ ಎಂದು ಪ್ರಾಮಾಣೀಕರಿಸುತ್ತಿದ್ದೇನೆ. ಈ ಒಪ್ಪಿಗೆ ಪತ್ರದ ಒಂದು ಪ್ರತಿಯನ್ನು ನಾನು ಪಡೆದುಕೊಂಡಿರುತ್ತೇನೆ.

ರೋಗಿಯ ಸಹಿ:

ಹೆಸರು:

ಸ್ಥಳ: ದಿನಾಂಕ: ಸಮಯ:

INFORMED CONSENT

Trial group

I, the undersigned do hereby give my full consent to take part in the following project—

Study of Snigdham Ashneeyaat with the intervention of Goghrita (cow's ghee) in relation to the status of Rasa dhatu and Lipid profile

After understanding, the objectives and nature of study as described below, which as explained and understood by me in my own language.

1) There is no expense on the part of the participant, nor will any remuneration be paid.
2) The information collected from you will be strictly confidential.
3) You are free to refuse to take part in this study or withdraw from the study at any time.
4) Your signature in this form indicates that you have understood to your satisfaction the information regarding participation in this research project and agree to be a participant of this study.
5) Incase if any imbalance occurs in your health status during the study period, you will be referred to OPD at our hospital and treatment would be provided free of cost by the institution.
6) If you as well as the investigator are evidently confirmed that any imbalance in your health status occurs during the study period is caused due to intake of ghee at the dosage of 18gms/day, then you are free to bring it to the notice of the ethical committee members.

Signature of Investigator Signature of the participant

Place

Date

INFORMED CONSENT

Control group

I, the undersigned do hereby give my full consent to take part in the following project—

Study of Snigdham Ashneeyaat with the intervention of Goghrita (cow's ghee) in relation to the status of Rasa dhatu and Lipid profile

After understanding, the objectives and nature of study as described below, which has been explained and understood by me in my own language.

1. There is no expense on the part of the participant, nor will any remuneration be paid.
2. The information collected from you will be strictly confidential.
3. You are free to refuse to take part in this study or withdraw from the study at any time.
4. Your signature in this form indicates that you have understood to your satisfaction the information regarding participation in this research project and agree to be a participant of this study.

Signature of Investigator Signature of the participant

Place

Date

DIET CHART

(Interventional group)

Timings	Schedule	Foods	Servings
Morning	Breakfast	Idli /dosa/ chapati/ upma / pongal / parota /poori/ poha Coffee/Tea/Milk	1-2 in number or 1 bowl 1 cup
Afternoon	Lunch	Parota/ chapatti / phulka/ Cooked rice/ cooked leafy vegetables / cooked vegetables/ green salad / Buttermilk	1 – 2 in number 1 bowl 1 cup
Evening	Tea time	Coffee / Tea / Milk	1 cup
Night	Dinner	Chapati/ phulka Cooked rice / cooked leafy vegetables / cooked vegetables / green salad	1-2 in number 1 cup

[Note: 1 cup = 100 to 150 ml]

1. Follow your routine accordingly.
2. Take one spoonful of ghee daily twice along with food for 30 days.
3. Do not take any extra amount of ghee than the said quantity.
4. Please avoid the following items

   Junk foods, Ice-cream, cheese, custard, yogurt, chocolate pudding, burger, puff, condiments, chats, chips, butter, pizza, ghee rice, fried rice, veg biryani, chicken biryani, deeply fried items Whole milk, non-dairy creamers, Processed meats, etc
5. Please do not take curds at night
6. Please do inform any changes you find in yourself regularly.

DIET CHART

(Non interventional group)

Timings	Schedule	Foods	Servings
Morning	Breakfast	Idli /dosa/ chapati/ upma / pongal / parota /poori/ poha Coffee/Tea/Milk	1-2 in number or 1 bowl 1 cup
Afternoon	Lunch	Parota/ chapatti / phulka/ Cooked rice/ cooked leafy vegetables / cooked vegetables/ green salad / Buttermilk	1 – 2 in number 1 bowl 1 cup
Evening	Tea time	Coffee / Tea / Milk	1 cup
Night	Dinner	Chapati/ phulka Cooked rice / cooked leafy vegetables / cooked vegetables / green salad	1-2 in number 1 cup

[Note: 1 cup = 100 to 150 ml]

1. Follow your routine accordingly.
2. Please avoid the following items

   Junk foods, Ice-cream, cheese, custard, yogurt, chocolate pudding, burger, puff, condiments, chats, chips, butter, pizza, ghee rice, fried rice, veg biryani, chicken biryani, deeply fried items Whole milk, non-dairy creamers, Processed meats, etc
3. Please do not take curds at night.
4. Please do inform any changes you find in yourself regularly.

KEY TO MASTER CHART

Gender/ Sex: 1 = Male 2= Female

Religion: 1= Hindu 2= Muslim 3= Christian 4= Others

Occupation 1= Under graduate student 2= Post graduate student 3= Doctor

4 = School Teacher 5= Technician 6= Driver

Diet 1: 1=Veg 2= Mixed

Diet 2: Frequency of consumption of food (times/day)

1= <4 2=4 3= >4 4=Not Fixed

Nonveg diet consumption: ---------- times /month

Appetite 1= Poor 2=Moderate 3= Good

Staple rice 1= Yes 2= No

Staple wheat 1= Yes 2= No

Dairy products 1= Yes 2= No

Fried food 1= Yes 2= No

Fish 1= Yes 2= No

Beef 1= Yes 2= No

Mutton 1= Yes 2= No

Chicken 1= Yes 2= No

Ice cream 1= Yes 2= No

Cake 1= Yes 2= No

Puff 1= Yes 2= No

Condiments 1= Yes 2= No

Burger 1= Yes 2= No

Chats 1= Yes 2= No

Pizza 1= Yes 2= No

Chips 1= Yes 2= No

Toast 1= Yes 2= No

Bread 1= Yes 2= No

Tea 1= Yes 2= No

Coffee 1= Yes 2= No

Milk 1= Yes 2= No

Juice 1= Yes 2= No

Soft drinks 1= Yes 2= No

Water quantity (litres/day)

1= <2 2= 2-4 3= >4 4= Not fixed

Mode of food preparation (if consumed)

Cooked 1

Uncooked 1

Fried 1

Fast food 1

Oil used (if consumed)

Sunflower 1

Coconut 1

Groundnut 1

Ghee 1

Palm oil 1

Others 1

Exercise 1= Yes 2= No

Type of exercise 1= Mild 2= Moderate 3= Heavy

Sleep 1= Disturbed 2= Undisturbed

Night sleep: 1= Yes 2= No

Hours/night 1= <6hrs 2= 6hrs 3= >6hrs 4= Not fixed

Day sleep 1= Yes 2= No

Hours/day 1= <1hr 2= 1hr 3= >1hr 4= Not fixed 5= No sleep

Bowel habit 1= Regular 2= Irregular

Bowel nature 1= Formed 2= Loose 3= Constipated

Micturition 1= Normal 2= Scanty 3= Excessive

Nature of work/ Professional History

1= Sedentary work 2= Involve physical strain

3= Sedentary involves mental strain 4= Both physical and mental strain

Emotional status:	1= Yes	2= No
1) Anxious		
2) Depressive		
3) Sentimental		
4) Jolly		
5) Irritable		
6) Aggressive		
7) Normal		

Habits / Addictions

Types	1=Yes	2= No
Beedis		
Cigarettes		
Alcohol		
Tobacco chewing		
Tobacco snuffs		
Beetle chewing		

Built and nourishment 1= Well 2= Moderate 3= Poor

Weight: BT AT

Harvard step test BT AT

Rasa dhatu karma

1=Present 2= Absent

		Before trial		After trial	
Sl.No	Signs and Symptoms	Present	Absent	Present	Absent
1	Tushti				
2	Preenana				
3	Rakta pushti				

Rasa vriddhi lakshana

1=Present 2= Absent

		Before trial		After trial	
Sl.No	Signs and Symptoms	Present	Absent	Present	Absent
1	Agni sada				
2	Praseka				
3	Alasya				
4	Gourava				
5	Shwaitya				
6	Shaitya				
7	Anga shaithilya				
8	Shwasa				
9	Kasa				
10	Atinidra				

Rasa kshaya lakshana

1=Present 2= Absent

		Before trial		After trial	
Sl.No	Signs and Symptoms	Present	Absent	Present	Absent
1	Rouksya				
2	Shrama				
3	Shosha				
4	Glani				
5	Shabda asahishnuta				

Twak sara lakshana

1=Present 2= Absent

		Before trial		After trial	
Sl.No	Signs and Symptoms	Present	Absent	Present	Absent
1	Snigdha				
2	Shlakshna				
3	Mridu				
4	Prasanna				
5	Sukshma				
6	Alpa				
7	Gambheera				
8	Sukumara loma				
9	Prabha				

Rasa pradoshaja vikara

1=Present 2= Absent

		Before trial		After trial	
Sl.No	Signs and Symptoms	Present	Absent	Present	Absent
1	Ashraddha				
2	Aruchi				
3	Aasya vairasya				
4	Arasagnata				
5	Hrillasa				
6	Gourava				
7	Tandra				
8	Angamarda				
9	Jwara				
10	Tama				
11	Pandutwa				
12	Srotorodha				
13	Klaibhya				
14	Sada				
15	Krishanga				
16	Agni nasha				
17	Vali				
18	Palita				

LAB INVESTIGATIONS

TESTS	**BT**	**AT**
Cholesterol		
Triglycerides		
HDL		
LDL		
VLDL		

AGNI PAREEKSHA

1= Pravara 2=Madhyama 3=Avara

1= Same 2= Reduced 3=Improved

Sl .no	Lakshana	Before trial	After trial	At the end of 1 month		
				Same	Reduced	Improved
1	Abhyavaharana shakti					

Jeerna lakshanas

1= Present 2= Absent

1= Same 2= Reduced 3=Improved

Sl .no	Lakshana	Before trial		After trial		At the end of 1 month		
		Present	Absent	Present	Absent	Same	Reduced	Improved
1	Udgara shuddhi							
2	Utsaha							
3	Malotsarjana							
4	Mutrotsarjana							
5	Laghuta							
6	Developing hunger							
7	Developing thirst							

Benefits of snigdha bhojana

1= Present 2= Absent

1= Same 2= Reduced 3=Improved

Sl .no	Lakshana	Before trial		After trial		At the end of 1 month		
		Present	Absent	Present	Absent	Same	Reduced	Improved
1	Bhujyamanam swadate							
2	Agni udeerana							
3	Kshipra jara							
4	Vatanulomana							
5	Shareera							

	upachaya							
6	Indriya dardhya							
7	Increases bala							
8	Increases varna							

Rakta Saara Lakshna

1= Present 2= Absent

Sl. no	Signs and symptoms	Before trial		After trial	
		Present	Absent	Present	Absent
1.	Snigdha and rakta varna of karna				
2.	Snigdha and rakta varna of Akshi				
3.	Snigdha and rakta varna of Mukha				
4.	Snigdha and rakta varna of Jihwa				
5.	Snigdha and rakta varna of Nassa				
6.	Snigdha and rakta varna of Oshtha				
7.	Snigdha and rakta varna of Panitala				
8.	Snigdha and rakta varna of Padatala				
9.	Snigdha and rakta varna of Nakha				
10.	Snigdha and rakta varna of lalata				
11.	Snigdha and rakta varna of Mehana				
12.	Shobhayukta				

WHO questionnaire for assessment of quality of life is included in the case sheet. So in the master chart the transformed scores from 0-100 have been entered for domains 1,2,3,4 both before and after trial.

					veg/ mixed	freque ncy	Times/ month			mode of food preparation				oil used																EMOTIONAL STATUS							
Name	Age	Gen der	Religi on	Occup ation	Diet 1	Diet 2	Non Veg consum ption	Appe tite	Water Quantity	Cook ed	Unco oked	Fried	Fast Food	Sunfl ower	Coco nut	Groun dnut	Ghee	Pal m oil	Oth ers	exer cise	type of exerci se	Nature of Sleep	Night Sleep	Sleep Hours	Day Sleep	Day Sleep Hours	bowel habit	bowel nature	Micturitio n- Quantity	Natur e of Work	Anxio us	Depr essiv e	Senti menta l	Jolly	Irrita ble	Aggre ssive	Nor mal	Built & Nourishm ent
Anuja Bhagwat	33	2	1	3	1	2		2	1	1						1				1	1	1	1	1	2		1	1	1	3	2	2	1	1	1	2	1	2
Nikhila Hiremath	37	2	1	3	1	1		2	2	1				1			1			1	1	2	1	2	2		1	1	1	3	1	1	1	1	2	2	1	2
Jalindar Dhamale	37	1	1	3	2	1	1	2	2	1				1					1	1	1	2	1	3	2		1	1	1	3	2	2	1	1	2	2	1	2
Savitha shenoy	35	2	1	3	2	2	2	3	1	1				1	1		1			2		1	1	3	2		2	1	1	3	2	2	1	1	1	2	1	3
Deepali Dhamale	34	2	1	5	2	1	1	3	2	1				1			1		1	2		2	1	3	2		1	1	1	4	1	1	1	2	2	2	1	2
Ranjith Shetty	32	1	1	3	2	2	8	3	2	1	1		1		1					2		2	1	3	2		1	1	1	3	2	2	2	1	2	2	1	1
Savitha Kudari	31	2	1	3	1	2		2	2	1		1				1	1			2		1	1	1	2		1	1	1	3	1	1	1	2	2	2	1	2
Sriharsha	29	1	1	3	1	2		3	2	1				1						2		2	1	2	2		1	1	1	4	2	2	2	1	2	1	1	2
Santosh Dixit	33	1	1	3	1	2		3	2	1			1	1						1	1	2	1	2	2		1	1	1	4	2	2	1	2	2	2	1	1
Sowmyashree	30	2	1	3	1	4		3	4	1			1		1	1	1			2		1	1	1	2		1	1	1	3	2	2	1	1	1	2	1	3
Gahnavi	20	2	1	1	1	1		2	2	1				1						2		2	1	3	2		2	2	3	3	2	2	1	1	1	2	1	2
Preeti. P	20	2	1	1	1	2		3	4	1				1						1	2	2	1	3	2		1	1	1	3	2	2	2	1	2	2	1	1
Uttam Kumar	20	1	1	1	1	2		3	2	1				1						2		1	1	2	2		1	1	1	3	1	2	1	1	2	2	1	2
Aishwarya Gupta	21	2	1	1	1	1		2	2	1				1						2		2	1	3	2		1	1	1	3	2	2	2	1	2	2	1	2
Dodda Sripriya	21	2	1	1	1	2		2	1	1									1	1	1	2	1	2	2		1	1	1	3	2	2	2	1	2	2	1	1
Radhika	22	2	1	1	1	1		2	4	1				1						2		2	1	2	2		2	3	1	3	2	2	1	1	2	1	1	3
Laxmi Abbigeri	21	2	1	1	1	1		2	4	1				1						1	1	2	1	2	2		1	1	1	4	1	1	1	2	1	1	2	3
Sangeetha Gajendragad	21	2	1	1	1	1		2	1	1				1						2		2	1	3	2		1	1	1	1	2	2	1	2	2	2	2	3
Aditi Gandhi	22	2	1	1	1	2		3	1	1				1						2		2	1	2	2		1	1	1	3	2	2	1	1	2	2	1	3
Siminayani	21	2	1	1	1	1		2	2	1						1				1	2	2	1	2	2		1	1	1	3	1	2	1	1	1	2	1	2
Rohith	20	1	1	1	2	1	3	2	2	1		1	1	1						1	2	2	1	2	2		1	1	1	3	2	2	2	1	2	2	1	2
Souvik Manna	21	1	1	1	2	2	6	3	2	1				1					1	1	2	2	1	1	2		1	1	1	3	2	1	2	1	2	1	1	2
Shruthi	20	2	1	1	2	2	8	3	4	1								1	2	2		2	1	3	1	2	1	1	1	2	2	2	1	1	2	2	1	2
Manasa	21	2	1	1	2	2	4	3	4	1				1						2		2	1	3	1	4	1	1	1	4	2	1	2	1	2	1	1	1
Khushali Balpande	21	2	1	1	1	2		2	2	1				1						1	1	2	1	3	2		1	1	1	1	2	2	2	1	2	2	1	2
Divya Rangrej	25	2	1	2	1	1		2	2	1		1		1		1				2		2	1	3	2		1	1	1	1	2	2	2	1	2	2	1	2
Avinash Mishra	26	1	1	2	1	1		2	2	1				1						1	1	2	1	2	2		1	1	1	3	2	1	2	2	2	2	1	2
Srilekha	24	2	1	2	1	3		2	2	1				1		1				1	2	2	1	3	2		1	1	1	3	1	2	1	2	2	2	1	1
Pooja Prasad	24	2	1	2	1	1		3	2	1				1			1		1	2		2	1	3	2		1	1	1	3	2	2	1	1	2	2	1	1
Roopa.K.V	35	2	1	3	1	2		2	2	1		1				1	1			2		1	1	1	2		1	1	1	3	1	1	1	2	2	2	1	2
Midhu Parvathi	30	2	1	3	1	2		2	1	1						1				1	1	1	1	1	2		1	1	1	3	2	2	1	1	1	2	1	2
Ashwini Dinesh	36	2	1	3	2	2	2	3	1	1				1	1		1					1	1	3	2		2	1	1	3	2	2	1	1	1	2	1	3
Malavi Shayan	33	2	1	3	1	4		3	4	1			1		1	1	1			2		1	1	1	2		1	1	1	3	2	2	1	1	1	2	1	3
Vivek. J	38	1	1	3	2	1	1	2	2	1				1					1	1	1	2	1	3	2		1	1	1	3	2	2	1	1	2	2	1	2
Rachana	27	2	1	2	1	1		2	2	1		1		1		1				2		2	1	3	2		1	1	1	1	2	2	2	1	2	2	1	2
Nishchal	28	1	1	2	1	1		2	2	1				1						1	1	2	1	2	2		1	1	1	3	2	1	2	2	2	2	1	2
Sanket	28	1	1	2	1	3		2	2	1				1		1				1	2	2	1	3	2		1	1	1	3	1	2	1	2	2	2	1	1
Madhumita	26	2	1	2	1	1		3	2	1				1			1		1	2		2	1	3	2		1	1	1	3	2	2	1	1	2	2	1	1
Keerti	30	2	1	2	1	2		3	2	1				1						2		2	1	2	2		1	1	1	4	2	2	2	1	2	1	1	2
Arpan Choudhury	27	1	1	2	2	2	6	3	2	1				1						1	2	2	1	1	2		1	1	1	3	2	1	2	1	2	1	1	2
Yamuna Reddy	27	1	1	2	1	1		2	2	1		1		1		1				2		2	1	3	2		1	1	1	1	2	2	2	1	2	2	1	2
Sanskriti	26	2	1	2	1	1		2	4	1				1						2		2	1	2	2		2	3	1	3	2	2	1	1	2	1	1	3
Monika	27	2	1	4	1	1		2	2	1						1				1	2	2	1	2	2		1	1	1	3	1	2	1	1	1	2	1	2
Anjali	28	2	1	4	1	2		2	1	1									1	1	1	2	1	2	2		1	1	1	3	2	2	2	1	2	2	1	1
Madhuresh	23	1	1	5	2	1	3	2	2	1		1	1	1						1	2	2	1	2	2		1	1	1	3	2	2	2	1	2	2	1	2
Suryanarayana	22	1	1	5	1	2		3	2	1				1						2		1	1	2	2		1	1	1	3	1	2	1	1	2	2	1	2
Navaneet	25	1	1	1	1	1		2	2	1				1						2		2	1	3	2		2	2	3	3	2	2	1	1	1	2	1	2
Pavan	24	1	1	1	2	2	8	3	4	1									1	2		2	1	3	1	2	1	1	1	2	2	2	1	1	2	2	1	2
Narayani	23	2	1	1	2	2	4	3	4	1						1				2		2	1	3	1	4	1	1	1	4	2	1	2	1	2	1	1	1
Parvathi Pillai	23	2	1	2	1	2		2	2	1						1				1	1	2	1	3	2		1	1	1	1	2	2	2	1	2	2	1	2

					RASA DHATU KARMA BEFORE AND AFTER STUDY						RASA VRIDDHI LAKSHANA BEFORE AND AFTER STUDY																		
Name	weight BT	weight AT	H.step test BT	H.step test AT	Tushti BT	Tushti AT	preenana BT	Peenana AT	rakta pushti BT	Rakt pushti AT	agni sada BT	Agnisada AT	praseka BT	Praseka AT	alasya BT	ALASY AAT	gourava BT	GOURA VAAT	shwaitya	SHWAI TYAAT	shaitya BT	SHAITY AAT	anga shaithilya BT	ANGA SHAITH ILYA AT	shwasa BT	SHWAS A	kasa BT	KASA AT	atinidra BT	ATINID RAAT
Anuja Bhagwat	58.7	59	43.83	45.67	1	1	1	1	1	1	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Nikhila Hiremath	55.4	56.5	53.5	49.7	1	1	1	1	1	1	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Jalindar Dhamale	66	66	105.63	105.82	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Savitha shenoy	47.2	48	96.1	87.71	1	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2
Deepali Dhamale	62.2	63	55.62	57.23	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Ranjith Shetty	78.2	78.5	66.36	65.42	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Savitha Kudari	49.7	50	47.01	49.64	1	1	1	1	1	1	1	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Sriharsha	70.7	70.4	89.86	90.12	2	1	2	1	1	1	1	2	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2
Santosh Dixit	102	100	63.82	64.56	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Sowmyashree	48.4	49	44.79	50.6	2	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Gaimavi	52	52	69.14	71.23	1	1	1	1	2	1	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Preeti. P	66	66	58.5	59.2	1	1	1	1	1	1	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Uttam Kumar	63.6	63.8	67.3	70.78	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Aishwarya Gupta	51.8	52	65.21	68.42	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	1	2
Dodda Sripriya	57.5	57.8	62.79	65.38	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Radhika	46	46	57.14	63.28	1	1	1	1	1	1	1	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Laxmi Abbigeri	39.1	39.3	37.6	42.73	1	1	1	1	1	1	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	1	2	2	2
Sangeetha Gajendragad	43.1	44.5	59.3	61.2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Aditi Gandhi	37.7	38	82.41	88.63	1	1	1	1	1	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2
Siminayani	49.9	48.4	83.33	88.54	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Rohith	63.4	62.9	74.62	75.31	1	1	1	1	1	1	1	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Souvik Manna	66.8	67.6	78.12	79.54	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Shruthi	50.1	50.9	92.02	94.8	1	1	1	1	2	1	2	2	2	2	1	2	2	2	2	2	2	2	1	2	1	2	2	2	1	1
Manasa	70	70.6	84.37	85.26	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2
Khushali Balpande	56.2	55.6	79.36	80.42	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Divya Rangrej	55.1	55	66.1	69.32	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Avinash Mishra	66.4	67	136.98	138.24	1	1	1	1	1	1	2	2	2	2	1	2	1	2	2	2	2	2	1	2	2	2	2	2	2	2
Srilekha	75.8	76	29.59	30.46	2	1	2	1	2	1	2	2	2	2	1	2	1	2	2	2	2	2	2	2	1	1	1	1	2	2
Pooja Prasad	79.4	80	26.25	28.32	1	1	1	1	1	1	2	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1	1
Roopa.K.V	49.7	50	47.01	49.64	1	1	1	1	1	1	1	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Madhu Parvathi	58.7	59	43.83	45.67	1	1	1	1	1	1	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Aishwini Dinesh	47.2	48	96.1	87.71	1	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2
Malavi Shayan	48.4	49	44.79	50.6	2	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Vivek. J	66	66	103.63	106.82	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Rachana	55.1	55	66.1	69.32	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Nishchal	66.4	67	126.98	128.24	1	1	1	1	1	1	2	2	2	2	1	2	1	2	2	2	2	2	1	2	2	2	2	2	2	2
Sanket	75.8	76	29.59	30.46	2	1	2	1	2	1	2	2	2	2	1	2	1	2	2	2	2	2	2	2	1	1	1	1	2	2
Madhumita	79.4	80	26.25	28.32	1	1	1	1	1	1	2	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1	1
Keerti	70.7	70.4	89.86	90.12	2	1	2	1	1	1	1	2	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2
Arpan Choudhury	66.8	67.6	78.12	79.54	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Yamuna Reddy	55.1	55	66.1	69.32	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Sanskriti	46	46	57.14	63.28	1	1	1	1	1	1	1	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Monika	49.9	48.4	83.33	88.54	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Anjali	57.5	57.8	62.79	65.38	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Madhuresh	63.4	62.9	74.62	75.31	1	1	1	1	1	1	1	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Suryanarayana	63.6	63.8	67.3	70.78	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Navaneet	52	52	69.14	71.23	1	1	1	1	2	1	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pavan	50.1	50.9	92.02	94.8	1	1	1	1	2	1	2	2	2	2	1	2	2	2	2	2	2	2	1	2	1	2	2	2	1	1
Narayani	70	70.6	84.37	85.26	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2
Parvathi Pillai	56.2	55.6	79.36	80.42	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

	RASA KSHAYA LAKSHANA BEFORE AND AFTER STUDY											TWAK SARA LAKSHANA BEFORE AND AFTER STUDY															
Name	roukshya BT	ROUKSHYA AT	shrama BT	SHRAMA AT	shosha BT	SHOSHA AT	glani BT	GLANI AT	shabda asahishnuta BT	SHABDA ASAHISHNUTA AT	snigdha BT	SNIGDHA AT	shlakshna BT	SHLAKSHNA AT	mridu BT	MRIDU AT	prasanna BT	PRASANNA AT	sukshma BT	SUKSHMA T	alpa BT	ALPA AT	gambheera BT	GAMBHEERA AT	sukumara loma BT	SUKUMARA LOMA AT	prabha BT	PRABHA AT
Anuja Bhagwat	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
Nikhila Hiremath	2	2	1	2	2	2	1	2	2	2	1	1	1	1	1	1	2	1	1	1	1	1	2	2	1	1	1	1
Jalindar Dhamale	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Savitha shenoy	1	2	1	1	1	2	2	2	2	2	2	2	2	1	1	1	2	1	2	2	2	2	1	1	2	2	2	1
Deepali Dhamale	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	1	2	1	2	1	2	2	1	1	1	1	2	2
Ranjith Shetty	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1
Savitha Kudari	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	2	1
Sriharsha	1	2	1	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Santosh Dixit	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	1	1	1	2	2	2	2	1	1	2	2	1	1
Sowmyashree	2	2	1	2	1	2	2	2	1	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	2	1
Gahnavi	2	2	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1
Preeti. P	2	2	2	2	1	2	2	2	2	2	1	1	1	1	2	1	2	1	2	2	2	2	1	1	2	1	1	1
Uttam Kumar	1	2	2	2	2	2	1	2	2	2	2	1	1	1	1	1	1	1	2	2	2	2	1	1	2	1	1	1
Aishwarya Gupta	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1
Dodda Sripriya	2	2	1	2	2	2	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1
Radhika	1	1	1	1	2	2	2	2	2	2	2	1	2	2	1	1	2	1	2	2	2	2	1	1	1	1	2	1
Laxmi Abbigeri	1	2	1	2	2	2	1	2	1	2	2	1	2	1	1	1	2	1	1	1	2	1	1	1	1	1	2	1
Sangeetha Gajendragad	1	2	1	2	2	2	2	2	2	2	2	1	2	2	1	1	2	1	1	1	2	2	1	1	1	1	2	2
Aditi Gandhi	2	2	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1
Siminayani	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1
Rohith	2	2	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1
Souvik Manna	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2	1	2	1	1	1	1	1	2	2	2	2	2	1
Shruthi	2	2	1	2	1	2	1	2	1	2	2	1	2	1	1	1	2	1	1	1	1	1	1	1	2	2	2	1
Manasa	2	2	1	2	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	2	1	1
Khushali Balpande	2	2	2	2	2	2	1	2	2	2	1	1	2	2	1	1	2	1	2	1	2	2	1	1	1	1	2	1
Divya Rangrej	2	2	1	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1
Avinash Mishra	2	2	1	2	2	2	2	2	2	2	2	1	2	2	1	1	1	1	2	2	2	2	2	2	1	1	1	1
Srilekha	2	2	2	2	2	2	2	2	2	2	1	1	2	2	1	1	2	1	1	1	2	2	2	2	2	2	2	1
Pooja Prasad	2	2	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1
Roopa.K.V	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	2	1
Midhu Parvathi	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
Ashwini Dinesh	1	2	1	1	1	2	2	2	2	2	2	2	2	1	1	1	2	1	2	2	2	2	1	1	2	2	2	1
Malavi Shayan	2	2	1	2	1	2	2	2	1	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	2	1
Vivek. J	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rachana	2	2	1	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1
Nishchal	2	2	1	2	2	2	2	2	2	2	2	1	2	2	1	1	1	1	2	2	2	2	2	2	1	1	1	1
Sanket	2	2	2	2	2	2	2	2	2	2	1	1	2	2	1	1	2	1	1	1	2	2	2	2	2	2	2	1
Madhumita	2	2	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1
Keerti	1	2	1	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Arpan Choudhury	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2	1	2	1	1	1	1	1	2	2	2	2	2	1
Yamuna Reddy	2	2	1	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1
Sanskriti	1	1	1	1	2	2	2	2	2	2	2	1	2	2	1	1	2	1	2	2	2	2	1	1	1	1	2	1
Monika	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1
Anjali	2	2	1	2	2	2	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1
Madhuresh	2	2	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1
Suryanarayana	1	2	2	2	2	2	1	2	2	2	2	1	1	1	1	1	1	1	2	2	2	2	1	1	2	1	1	1
Navaneet	2	2	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1
Pavan	2	2	1	2	1	2	1	2	1	2	2	1	2	1	1	1	2	1	1	1	1	1	1	1	2	2	2	1
Narayani	2	2	1	2	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	2	1	1
Parvathi Pillai	2	2	2	2	2	2	1	2	2	2	1	1	2	2	1	1	2	1	2	1	2	2	1	1	1	1	2	1

	RASA PRADOSHAJA VIKARA BEFORE AND AFTER STUDY																																		
Name	ashraddh a BT	ASHRA DDHA AT	aruchi BT	ARUCHI AT	asya vairasya BT	ASYA VAIRAS YA AT	arasagnat a BT	ARASA GNATA AT	hrillasa BT	HRILLA S AT	gourava BT	GOURA VA AT	tandra BT	TANDR A AT	angamard a BT	ANGAM ARDA AT	jwara BT	JWARA AT	tama BT	TAMA AT	pandutwa BT	PANDU TWA T	srotorodh a BT	SROTO RODHA T	klaibhya BT	KLAIBH YA AT	sada BT	SADA AT	krishanga BT	KRISHA NGA AT	agni nasha BT	AGNI NASHA AT	vali BT	VALI AT	palita BT	PALITA AT
Anuja Bhagwat	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Nikhila Hiremath	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Jatindar Dhamale	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1
Savitha shenoy	2	2	2	2	1	1	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	2	2	2	2
Deepali Dhamale	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Ranjith Shetty	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Savitha Kodari	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2
Sriharsha	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	1	1	1
Santosh Dixit	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Sowmyashree	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2
Gaiavi	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Preeti. P	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Uttam Kumar	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Aishwarya Gupta	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Dodda Sripriya	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Radhika	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	1	1	2	2	1	2	2	2	2
Laxmi Abbigeri	1	2	1	2	2	2	2	2	2	2	1	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2	1	2	1	1	1	2	1	2	2
Sangeetha Gajendragad	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Aditi Gandhi	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	1	1	1
Siminayani	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Rohith	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2
Souvik Manna	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Shruthi	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2
Manasa	1	2	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2
Khushali Balpande	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Divya Rangrej	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1
Avinash Mishra	2	2	2	2	2	2	2	2	2	2	1	2	1	2	1	2	2	2	2	2	2	2	1	2	2	2	1	2	2	2	2	2	2	1	1
Srilekha	2	2	1	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Pooja Prasad	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Roopa.K.V	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2
Madhu Parvathi	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Ashwini Dinesh	2	2	2	2	1	1	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	2	2	2	2
Malavi Shayan	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2
Vivek. J	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Rachana	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1
Nishchal	2	2	2	2	2	2	2	2	2	2	1	2	1	2	1	2	2	2	2	2	2	2	1	2	2	2	1	2	2	2	2	2	2	1	1
Sanket	2	2	1	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Madhumita	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Keerti	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	1	1	1
Arpan Choudhury	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Yamuna Reddy	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1
Sanskriti	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	1	1	2	2	1	2	2	2	2
Monika	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Anjali	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Madhuresh	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2
Suryanarayana	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Navaneet	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Pavan	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2
Narayani	1	2	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2
Parvathi Pillai	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

	LIPID PROFILE BEFORE AND AFTER TREATMENT										AGNI PAREEKASHA			JEERNA LAKSHANAS BEFORE AND AFTER STUDY AND AFTER 1 MONTH																		
NAME	cholesterol BT	cholesterol AT	TG BT	TG AT	HDL BT	HDL AT	LDL BT	LDL AT	VLDL BT	VLDL AT	abhyavahaarana shakti BT	ABHYAVAHARANA SHAKTI AT	ABHYAVAHARANA SHAKTI 1M	Udgara Suddhi BT	UDGARA SHUDDHI AT	UDGARA SHUDDHI 1M	Utsaha BT	UTSAHA AT	UTSAHA 1M	Malotsarjana BT	MALOTSARJANA AT	MALOTSARJANA 1M	Mutrotsarjana BT	MUTROTSARJANA AT	MUTROTSARJANA 1M	laghuta BT	LAGHUTA AT	LAGHUTA 1M	Developing Hunger BT	DEVELOPING HUNGER AT	DEVELOPING HUNGER 1M	Developing Thirst BT	DEVELOPIG THIRST AT	DEVELOPIG THIRST 1M
Anuja Bhagwat	185	172	99	101	34	37	129	118	20	19	2	2	3	1	1	2	2	1	3	1	1	1	1	1	1	2	1	3	1	1	3	1	1	3
Nikhila Hiremath	192	178	112	103	35	40	143	121	22	20	2	1	3	1	1	3	1	1	3	1	1	1	1	1	1	1	1	3	1	1	3	1	1	3
Jalindar Dhamale	196	176	155	109	35	42	147	110	31	21	1	1	1	1	1	3	1	1	3	1	1	1	1	1	1	1	1	3	1	1	3	1	1	3
Savitha shenoy	200	175	90	92	35	40	142	122	18	18	2	2	3	1	1	3	1	1	3	1	1	3	1	1	1	1	1	3	1	1	3	1	1	3
Deepali Dhamale	170	130	80	49	26	34	120	95	16	9	2	2	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	1	1	1	3	1	1	3
Ranjith Shetty	180	182	170	141	36	36	110	118	34	28	2	1	3	1	1	3	1	1	3	1	1	1	1	1	1	1	1	3	1	1	3	1	1	3
Savitha Kudari	158	149	101	97	29	31	107	101	20	19	2	2	3	1	1	3	1	1	3	1	1	1	1	1	1	1	1	3	1	1	3	1	1	3
Sriharsha	139	148	75	105	27	29	97	98	15	21	2	3	3	2	1	3	2	1	3	1	1	1	1	1	1	2	1	3	1	1	1	1	1	1
Santosh Dixit	181	172	168	135	36	38	112	107	33	27	1	1	3	1	1	3	1	1	3	1	1	1	1	1	1	1	1	3	1	1	3	1	1	3
Sowmyashree	160	151	69	57	30	32	115	110	13	11	2	1	3	1	1	3	1	1	3	1	1	1	1	1	1	1	1	3	1	1	3	1	1	3
Gahnavi	151	152	59	60	30	30	110	110	11	12	3	2	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Preeti. P	187	130	89	78	26	37	133	89	17	15	2	2	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Uttam Kumar	190	141	69	52	28	38	139	103	13	10	3	2	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Aishwarya Gupta	170	140	67	59	34	28	123	101	13	11	2	2	3	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Dodda Sripriya	187	160	81	58	32	37	134	117	16	11	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	1
Radhika	152	159	60	60	30	31	110	116	12	12	3	2	3	1	1	3	1	1	3	1	1	1	1	1	1	1	1	3	2	1	3	2	2	1
Laxmi Abbigeri	200	151	77	70	30	40	145	107	15	14	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Sangeetha Gajendragad	178	152	59	62	30	35	132	110	11	12	2	2	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Aditi Gandhi	137	161	59	69	27	32	99	116	11	13	2	2	3	1	1	3	1	1	3	1	1	3	1	1	1	1	1	3	1	1	3	1	1	3
Siminayani	178	166	59	64	35	33	132	121	11	12	2	1	3	1	1	3	1	1	3	1	1	1	1	1	1	1	1	3	1	1	3	1	1	3
Rohith	167	161	74	72	33	32	120	115	14	14	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	2	1	3	1	1	3	1	1	3
Souvik Manna	173	169	63	67	34	33	127	123	12	13	2	1	3	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Shruthi	189	174	87	76	34	37	135	125	17	15	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Manasa	191	179	100	81	38	35	133	128	20	16	1	1	1	1	1	3	1	1	3	2	2	1	2	2	1	1	1	1	1	1	3	1	1	3
Khushali Balpande	166	160	89	78	33	32	116	112	17	16	2	2	3	2	1	1	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Divya Rangrej	159	152	85	74	31	30	111	108	17	14	2	2	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Avinash Mishra	173	171	68	66	34	34	126	124	13	13	2	2	3	1	1	3	1	1	3	1	1	3	1	1	3	2	1	3	1	1	3	1	1	3
Srilekha	176	150	171	120	30	35	107	96	34	24	3	2	3	1	1	3	2	1	3	2	2	1	3	1	1	1	1	3	2	1	3	1	1	3
Pooja Prasad	189	157	89	78	37	38	135	103	17	16	2	2	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Roopa.K.V	158	149	101	97	29	31	107	101	20	19	2	2	3	1	1	3	1	1	3	1	1	1	1	1	1	1	1	3	1	1	3	1	1	3
Madhu Parvathi	185	172	99	101	34	37	129	118	20	19	2	2	3	1	1	2	2	1	3	1	1	1	1	1	1	2	1	3	1	1	3	1	1	3
Ashwini Dinesh	200	175	90	92	35	40	142	122	18	18	2	2	3	1	1	3	1	1	3	1	1	3	1	1	1	1	1	3	1	1	3	1	1	3
Malavi Shayan	160	151	69	57	30	32	115	110	13	11	2	1	3	1	1	3	1	1	3	1	1	1	1	1	1	1	1	3	1	1	3	1	1	3
Vivek. J	196	176	155	109	35	42	147	110	31	21	1	1	1	1	1	3	1	1	3	1	1	1	1	1	1	1	1	3	1	1	3	1	1	3
Rachana	159	152	85	74	31	30	111	108	17	14	2	2	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Nishchal	173	171	68	66	34	34	126	124	13	13	2	2	3	1	1	3	1	1	3	1	1	3	1	1	3	2	1	3	1	1	3	1	1	3
Sanket	176	150	171	120	30	35	107	96	34	24	3	2	3	1	1	3	2	1	3	2	2	1	3	1	1	1	1	3	2	1	3	1	1	3
Madhumita	189	157	89	78	37	38	135	103	17	16	2	2	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Keerti	139	148	75	105	27	29	97	98	15	21	2	3	3	2	1	3	2	1	3	1	1	1	1	1	1	2	1	3	1	1	1	1	1	1
Arpan Choudhury	173	169	63	67	34	33	127	123	12	13	2	1	3	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Yamuna Reddy	159	152	85	74	31	30	111	108	17	14	2	2	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Sanskriti	152	159	60	60	30	31	110	116	12	12	3	2	3	1	1	3	1	1	3	1	1	1	1	1	1	1	1	3	2	1	3	2	2	1
Monika	178	166	59	64	35	33	132	121	11	12	2	1	3	1	1	3	1	1	3	1	1	1	1	1	1	1	1	3	1	1	3	1	1	3
Anjali	187	160	81	58	32	37	134	117	16	11	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	1
Madhuresh	167	161	74	72	33	32	120	115	14	14	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	2	1	3	1	1	3	1	1	3
Suryanarayana	190	141	69	52	28	38	139	103	13	10	3	2	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Navaneet	151	152	59	60	30	30	110	110	11	12	3	2	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Pavan	189	174	87	76	34	37	135	125	17	15	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Narayani	191	179	100	81	38	35	133	128	20	16	1	1	1	1	1	3	1	1	3	2	2	1	2	2	1	1	1	1	1	1	3	1	1	3
Parvathi Pillai	166	160	89	78	33	32	116	112	17	16	2	2	3	2	1	1	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3

BENEFITS OF SNIGDHA BHOJANA BEFORE AND AFTER STUDY AND AFTER 1 MONTH																				
NAME	AGNI UDIRA NA AT	AGNI UDIRA NA 1M	Kshipra Jara BT	KSHIPR A JARA AT	KSHIPR A JARA 1M	Vatamulo mana BT	VATAN ULOMA NA AT	VATAN ULOMA NA 1M	Shariropa chaya BT	SHARIR OPACH YA AT	SHARIR OPACH YA 1M	Indriya Dhardhya BT	INDRIY A DARDH YA AT	INDRIY A DARDH YA 1M	Bala BT	BALA AT	BALA 1M	varna BT	VARNA AT	VARNA 1M
Anuja Bhagwat	1	3	2	1	3	1	1	3	1	1	3	2	1	3	2	1	3	2	1	3
Nikhila Hiremath	1	3	2	1	3	1	1	3	1	1	3	1	1	3	2	1	3	1	1	3
Jalindar Dhamale	1	3	1	1	1	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Savitha shenoy	1	3	1	1	3	1	1	3	2	1	3	1	1	3	2	1	3	2	1	3
Deepali Dhamale	1	3	1	1	3	1	1	1	1	1	3	1	1	1	1	1	3	1	1	3
Ranjith Shetty	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Savitha Kudari	1	3	2	1	3	1	1	3	2	1	3	1	1	3	2	1	3	2	1	3
Sriharsha	1	1	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3
Santosh Dixit	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Sowmyashree	1	3	2	2	3	1	1	3	1	1	3	1	1	3	2	1	3	1	1	3
Gahnavi	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Preeti. P	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Uttam Kumar	1	3	1	1	3	1	1	3	1	1	2	1	1	3	1	1	3	1	1	3
Aishwarya Gupta	1	3	2	1	3	1	1	3	1	1	3	1	1	3	2	1	3	1	1	1
Dodda Sripriya	1	3	1	1	3	2	1	3	1	1	3	1	1	1	1	1	3	1	1	3
Radhika	1	3	2	2	1	1	1	3	1	1	1	1	1	1	1	1	3	1	1	1
Laxmi Abbigeri	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Sangeetha Gajendragad	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Aditi Gandhi	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Siminayani	1	3	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Rohith	1	3	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	2	1	3
Souvik Manna	1	3	2	2	1	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Shruthi	1	3	1	1	3	1	1	3	1	1	3	1	1	3	2	1	3	2	1	3
Manasa	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	3	1	1	1
Khushali Balpande	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Divya Rangrej	1	3	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Avinash Mishra	1	3	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Srilekha	1	3	2	1	3	2	1	3	2	1	1	2	1	1	2	1	3	2	1	1
Pooja Prasad	1	3	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Roopa.K.V	1	3	2	1	3	1	1	3	2	1	3	1	1	3	2	1	3	2	1	3
Midhu Parvathi	1	3	2	1	3	1	1	3	1	1	3	2	1	3	2	1	3	2	1	3
Ashwini Dinesh	1	3	1	1	3	1	1	3	2	1	3	1	1	3	2	1	3	2	1	3
Malavi Shayan	1	3	2	2	3	1	1	3	1	1	3	1	1	3	2	1	3	1	1	3
Vivek. J	1	3	1	1	1	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Rachana	1	3	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Nishchal	1	3	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Sanket	1	3	2	1	3	2	1	3	2	1	1	2	1	1	2	1	3	2	1	1
Madhumita	1	3	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Keerti	1	1	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3
Arpan Choudhury	1	3	2	2	1	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Yamuna Reddy	1	3	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Sanskriti	1	3	2	2	1	1	1	3	1	1	1	1	1	1	1	1	3	1	1	1
Monika	1	3	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Anjali	1	3	1	1	3	2	1	3	1	1	3	1	1	1	1	1	3	1	1	3
Madhuresh	1	3	2	1	3	1	1	3	1	1	3	1	1	3	1	1	3	2	1	3
Suryanarayana	1	3	1	1	3	1	1	3	1	1	2	1	1	3	1	1	3	1	1	3
Navaneet	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
Pavan	1	3	1	1	3	1	1	3	1	1	3	1	1	3	2	1	3	2	1	3
Narayani	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	3	1	1	1
Parvathi Pillai	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3

	RAKTA SARA LAKSHANA BEFORE AND AFTER TREATMENT																						QUESTIONNAIRE DOMAINS 1,2,3,4 BEFORE AND AFTER TREATMENT							
NAME	Kama BT	KARNA AT	Akshi BT	AKSHI AT	Mukha BT	MUKHA AT	Jihwa BT	JIHWA AT	Nasa BT	NASA AT	Oshtha BT	OSHTH AAT	Panitala BT	PANITA LAAT	Padatala BT	PADAT ALAAT	Nakha BT	NAKHA AT	Lalata BT	LALAT AAT	Mehana BT	MEHAN AAT	Shobhay ukta BT	SHOBH AYUKT AAT	BTdomai n 1	AT domain 1	BTdomai n 2	ATdomai n 2	BTdomai n 3	ATdomai n 3	BTdomai n 4	ATdomai n 4
Anuja Bhagwat	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	1	1	2	2			2	2	38	44	63	69	56	56	75	75
Nikhila Hiremath	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			2	1	38	50	50	63	69	75	69	88
Jalindar Dhamale	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	56	63	75	81	75	100	88	100
Savitha shenoy	2	2	1	1	2	2	1	1	2	2	1	1	2	2	2	2	2	2	2	2			2	1	38	50	75	81	81	100	81	88
Deepali Dhamale	1	1	2	2	2	2	1	1	1	1	1	1	2	2	1	1	1	1	2	2			1	1	38	44	63	75	75	75	75	75
Ranjith Shetty	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	44	44	56	56	75	75	69	69
Savitha Kudari	1	1	1	1	2	2	1	1	2	1	2	1	1	1	1	1	2	1	1	1			2	1	38	56	56	69	94	100	63	81
Sriharsha	2	1	2	1	2	1	2	1	2	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1	44	50	63	75	81	94	63	75
Santosh Dixit	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	56	63	50	69	81	94	75	81
Sowmyashree	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	25	38	38	56	75	100	75	75
Gahnavi	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2			2	1	31	44	56	63	56	56	63	63
Preeti. P	2	2	2	2	1	1	1	1	2	2	1	1	1	1	2	2	1	1	1	1			1	1	44	44	63	69	69	75	44	56
Uttam Kumar	1	1	2	2	2	2	2	2	2	2	1	1	1	1	2	1	1	1	2	2	2	2	1	1	38	44	81	81	56	69	81	88
Aishwarya Gupta	2	2	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	2	2			1	1	50	50	50	63	75	75	44	44
Dodda Sripriya	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	38	38	31	56	75	75	69	69
Radhika	2	2	2	2	2	2	1	1	2	2	2	2	2	1	2	1	1	1	2	2			2	2	44	38	63	56	56	56	56	50
Laxmi Abbigeri	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1			2	1	38	63	56	81	44	56	56	63
Sangeetha Gajendragad	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1			2	1	44	50	63	81	69	69	81	88
Aditi Gandhi	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	38	44	56	69	56	69	63	63
Siminayani	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	44	56	56	69	69	81	69	88
Rohith	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	44	50	56	63	69	69	75	75
Souvik Manna	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	44	56	63	69	69	75	69	75
Shruthi	2	2	2	2	2	2	2	1	2	2	2	2	2	1	2	2	1	1	2	2			2	1	50	56	75	81	69	69	69	75
Manasa	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	44	50	63	56	75	75	69	81
Khushali Balpande	2	2	2	2	2	2	1	1	2	2	1	1	2	1	1	1	2	2	2	2			2	2	31	44	69	75	69	69	63	69
Divya Rangrej	2	2	2	2	2	2	1	1	2	2	2	2	2	1	2	2	2	2	2	2			2	1	44	44	56	63	75	75	81	88
Avinash Mishra	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	44	44	56	56	69	69	69	75
Srilekha	1	1	2	2	2	1	1	1	2	2	2	1	2	1	2	2	1	1	2	2			2	1	44	44	56	56	56	75	50	56
Pooja Prasad	2	2	2	2	2	2	1	1	2	2	2	2	2	1	2	2	2	2	2	2			2	1	44	44	56	56	81	81	81	81
Roopa.K.V	1	1	1	1	2	2	1	1	2	1	2	1	1	1	1	1	2	1	1	1			2	1	38	56	56	69	94	100	63	81
Midhu Parvathi	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	1	1	2	2			2	2	38	44	63	69	56	56	75	75
Ashwini Dinesh	2	2	1	1	2	2	1	1	2	2	1	1	2	2	2	2	2	2	2	2			2	1	38	50	75	81	81	100	81	88
Malavi Shayan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	25	38	38	56	75	100	75	75
Vivek. J	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	56	63	75	81	75	100	88	100
Rachana	2	2	2	2	2	2	1	1	2	2	2	2	2	1	2	2	2	2	2	2			2	1	44	44	56	63	75	75	81	88
Nishchal	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	44	44	56	56	69	69	69	75
Sanket	1	1	2	2	2	1	1	1	2	2	2	1	2	1	2	2	1	1	2	2	2	2	2	1	44	44	56	56	56	75	50	56
Madhumita	2	2	2	2	2	2	1	1	2	2	2	2	2	1	2	2	2	2	2	2			2	1	44	44	56	56	81	81	81	81
Keerti	2	1	2	1	2	1	2	1	2	1	1	1	1	1	1	1	2	1	2	1			1	1	44	50	63	75	81	94	63	75
Arpan Choudhury	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	44	56	63	69	69	75	69	75
Yamuna Reddy	2	2	2	2	2	2	1	1	2	2	2	2	2	1	2	2	2	2	2	2			2	1	44	44	56	63	75	75	81	88
Sanskriti	2	2	2	2	2	2	1	1	2	2	2	2	2	1	2	1	1	1	2	2			2	2	44	38	63	56	56	56	56	50
Monika	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	44	56	56	69	69	81	69	88
Anjali	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	38	38	31	56	75	75	69	69
Madhuresh	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	44	50	56	63	69	69	75	75
Suryanarayana	1	1	2	2	2	2	2	2	2	2	1	1	1	1	2	1	1	1	2	2	2	2	1	1	38	44	81	81	56	69	81	88
Navaneet	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	31	44	56	63	56	56	63	63
Pavan	2	2	2	2	2	2	2	1	2	2	2	2	2	1	2	2	1	1	2	2	2	2	2	1	50	56	75	81	69	69	69	75
Narayani	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	44	50	63	56	75	75	69	81
Parvathi Pillai	2	2	2	2	2	2	1	1	2	2	1	1	2	1	1	1	2	2	2	2			2	2	31	44	69	75	69	69	63	69

					veg/ mixed	frequency	Times/month			mode of food preparation				oil used															EMOTIONAL STATUS							
Name	Age	Gender	Religion	Occupation	Diet 1	Diet 2	Non Veg consumption	Appetite	Water Quantity	Cooked	Uncooked	Fried	Fast Food	Sunflower	Coconut	Groundnut	Ghee	Palm oil	Others	exercise	type of exercise	Nature of Sleep	Sleep Hours	Day Sleep	Day Sleep Hours	bowel habit	bowel nature	Micturition-Quantity	Nature of Work	Anxious	Depressive	Sentimental	Jolly	Irritable	Aggressive	Normal	Built & Nourishment
Divyashree	35	2	1	3	1	2	-	3	2	1		1		1		1	1			2	-	2	1	2	-	1	1	1	3			1				1	2
Madhushree	35	2	1	3	2	1	4	2	2	1		1		1						2	-	2	3	2	-	1	1	1	3				1			1	2
Mahesh	40	1	1	3	1	1	-	3	2	1		1				1				2	-	2	3	2	-	2	3	1	3	1			1		1	1	1
Vikram	39	1	1	3	1	2		3	2	1		1		1						2		2	2	2		1	1	1	3	1		1	1	1	1	1	2
Praveen Kumar	35	1	1	3	1	2	-	2	2	1				1	1					1	1	2	1	2	-	1	1	1	3			1	1			1	1
Susheel	38	1	1	6	2	2	1	3	3	1				1						1	2	2	2	2		1	1	1	1			1	1			1	1
Naveen B. S	33	1	1	2	1	1		3	2	1		1				1	1			2		2	3	2		1	1	1	3	1		1	1	1	1		1
SriNagesh	37	1	1	2	1	2	-	3	1	1		1			1		1			2	-	2	3	2	-	1	1	1	1	1		1	1	1		1	2
Roza	22	2	1	1	1	1		2	1	1		1		1						1	2	2	2	2		1	1	1	4			1	1			1	2
Shilpashree	22	2	1	1	2	1	2	3	1	1		1		1						1	`	2	3	2		1	1	1	3			1	1			1	3
Vishakha	22	2	1	1	1	1		3	2	1				1						2		2	2	2		1	1	1	1			1	1	1	1		3
Supriya	23	2	1	1	1	1		3	1	1		1				1				2		2	3	2		1	1	1	1	1	1	1		1	1		3
Deepak Saini	20	1	1	1	1	1	-	2	2	1					1		1			2	-	2	4	1	2	1	1	1	4			1	1			1	1
Akash Gupta	20	1	1	1	2	4	6	3	2	1	1	1	1	1						2	-	2	3	2	-	2	3	1	1	1		1	1			1	2
Chinmayee Chamat	21	2	1	1	1	4	-	2	2	1		1	1	1					1	1	1	2	1	1	4	2	3	1	3	1			1	1	1		2
Anisha Khandelwal	20	2	1	1	1	4	-	2	4	1		1		1					1	2	-	2	4	2	-	1	1	1	3			1	1			1	1
Rajani Kagga	27	2	1	3	1	1		2	2	1		1		1						1	2	2	3	2		1	1	1	4			1	1		1	1	2
Yash Chouhan	21	1	1	1	2	1	4	3	2	1				1						1	1	2	2	2		1	2	1	3				1	1			1
Suraj	21	1	1	1	1	1	2	2	2	1		1		1						1	1	2	2	2	5	1	1	1	3	1			1	1	1	1	2
Apoorva Koteshwar	20	2	1	1	1	2		2	1	1		1		1			1			1	2	2	2	2		1	1	1	1			1	1	1		1	2
Pradeep Kumar	21	1	1	1	2	1	2	2	2	1				1						1	2	2	3	1	1	1	3	1	3		1	1	1		1	1	1
Nimmi	21	2	1	1	2	4	2	2	3	1		1			1					1	1	2	3	2		1	1	1	1							1	2
Poornashree	21	2	1	1	1	2		2	3	1		1					1			1	1	2	3	2	5	1	1	1	1							1	2
Chethana	28	2	1	2	1	1	-	3	3	1				1		1	1		1	2	-	2	1	2	5	1	1	1	1,3							1	1
Makarand	24	1	1	2	2	3	2	3	2	1		1		1						1	1	2	3	2	-	1	1	1	3							1	2
Devi	27	2	1	2	1	1	-	2	2	1					1					1	2	2	1	2	-	1	1	1	3							1	3
Madhura	26	2	1	2	1	4	-	3	1	1				1						2	-	1	2	2	-	1	1	1	1,3	1		1	1	1	1		2
Naveen. V	38	1	1	3	2	2	1	3	3	1				1						1	2	2	2	2		1	1	1	1			1	1			1	1
Rudresh. S	36	1	1	3	1	2	-	2	2	1				1	1					1	1	2	1	2	-	1	1	1	3			1	1			1	1
Rakshith	32	1	1	3	1	1		3	2	1		1				1	1			2		2		2		1	1	1	3	1		1	1	1	1		1
Athira	26	2	1	2	1	4	-	3	1	1				1						2	-	1	2	2	-	1	1	1	1,3	1		1	1	1	1		2
Shivamanjunath	39	1	1	3	1	2		3	2	1		1		1						2		2	2	2		1	1	1	3	1		1	1	1	1	1	2
Madhav	27	1	1	2	1	1		2	2	1		1		1						1	2	2	3	2		1	1	1	4			1	1		1	1	2
Guru. S	33	1	1	3	2	1	4	2	2	1		1		1						2	-	2	3	2	-	1	1	1	3				1			1	2
Priyanka	28	2	1	4	1	1	-	2	2	1					1					1	2	2	1	2	-	1	1	1	3							1	3
Sudhir	29	1	1	2	2	3	2	3	2	1		1		1						1	1	2	3	2	-	1	1	1	3							1	2
Sumana	27	2	1	4	1	1	-	3	3	1				1		1	1		1	2	-	2	1	2	5	1	1	1	1,3							1	1
Parna	23	2	1	1	1	1		3	1	1		1				1				2		2	3	2		1	1	1	1	1	1	1		1	1		3
Chandana	23	2	1	1	1	1		3	2	1		1		1						2		2	2	2		1	1	1	1			1	1	1	1		3
Sudheshna	23	2	1	1	2	1	2	3	1	1		1		1						1	`	2	3	2		1	1	1	3				1	1		1	3
Meenu Mohan	24	2	1	1	1	2		2	1	1		1		1			1			1	2	2	2	2		1	1	1	1			1	1	1		1	2
Dibyajyothi Moharana	24	1	1	5	2	1	4	3	2	1		1		1						1	1	2	2	2		1	2	1	3				1	1			1
Anantu Sunil	24	1	1	5	2	1	2	2	2	1				1						1	2	2	3	1	1	1	3	1	3		1	1	1		1	1	1
Siddharth	22	1	1	1	1	1	-	2	2	1					1		1			2	-	2	4	1	2	1	1	1	4			1	1			1	1
Prashanth Sharma	22	1	1	1	2	4	6	3	2	1	1	1	1	1						2	-	2	3	2	-	2	3	1	1	1		1	1			1	2
Shashikala	22	2	1	1	1	4	-	2	4	1		1		1					1	2	-	2	4	2	-	1	1	1	3			1	1			1	1
Keya Sonawala	22	2	1	1	1	4	-	2	2	1		1	1	1					1	1	1	2	1	1	4	2	3	1	3	1			1	1	1		2
Apoorva K.S	22	2	1	1	1	2		2	3	1		1					1			1	1	2	3	2	5	1	1	1	1							1	2
Ahana	27	2	1	2	1	2	-	3	2	1		1		1		1	1			2	-	2	1	2	-	1	1	1	3			1				1	2
Apta Krishna	22	2	1	1	2	1	2	3	1	1		1		1						1	`	2	3	2		1	1	1	3			1	1			1	3

Name	weight BT	weight AT	H.step test BT	H.step test AT	Tushti BT	Tushti AT	preenana BT	Peenana AT	rakta pushti BT	Rakt pushti AT	agni sada BT	Agnisada AT	praseka BT	Praseka AT	alasya BT	ALASYA AT	gourava BT	GOURAVA AT	shwaitya	SHWAITYA AT	shaitya BT	SHAITYA AT	anga shaithilya BT	ANGA SHAITHILYA AT	shwasa BT	SHWASA	kasa BT	KASA AT	atinidra BT	ATINIDRA AT
Divyashree	49.7	51.2	98.3	97.68	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Madhushree	63.7	65	73.7	68.2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mahesh	74.1	75	76.5	71.6	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Vikram	71.7	72	36	34	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Praveen Kumar	76.4	75.7	64.6	62.34	1	1	1	1	1	1	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Susheel	75.2	76	74.25	70.32	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Naveen. B S	66.8	67	81.08	78.02	1	1	1	1	1	1	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
SriNagesh	67.7	68	83.21	80.42	2	2	1	1	1	1	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	1	1	2	2	2
Roza	45.3	46.5	81.75	79.23	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2
Shilpashree	45.7	46.2	72.3	70.42	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Vishakha	47.2	47.3	38.65	37.12	1	1	1	1	1	1	2	2	2	2	1	1	1	1	2	2	2	2	1	1	2	2	2	2	2	2
Supriya	43.3	43.8	52.24	51.63	2	2	1	1	1	1	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	1	1	2	2	2
Deepak Saini	106.5	106	69.8	65.63	1	1	1	1	1	1	2	2	2	2	1	1	1	1	2	2	1	1	2	2	2	2	2	2	1	1
Akash Gupta	66.2	66.7	82.87	81.42	2	2	1	1	1	1	2	2	2	2	1	2	1	1	2	2	2	2	2	2	2	2	2	2	1	2
Chinmayee Chanat	56.6	57	58.4	56.73	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	1
Anisha Khandelwal	56.5	56.1	90.36	88.23	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Rajani Kagga	62.2	62.5	58.67	56.23	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Yash Chouhan	84.9	88.3	78.12	71.36	1	1	1	1	1	1	2	2	2	2	1	1	1	1	2	2	2	2	2	1	2	2	2	1	2	2
Suraj	53.9	53.1	107.14	98.46	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Apoorva Koteshwar	63.1	63.3	68.94	63.25	1	1	1	1	2	2	1	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2
Pradeep Kumar	78.6	78	104.89	97.62	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Nimmi	56.5	54.6	78.94	70.62	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2
Poornashree	60.5	57.6	82.41	77.62	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Chethana	70	70	47.12	46.38	1	1	1	1	1	1	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Makarand	71.6	72	68.87	67.63	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Devi	48	48.2	86.7	85.79	1	1	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	1	1	2	2	2	2	1	1
Madhura	59.7	59.7	47.61	47.23	1	1	2	2	1	1	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1
Naveen. V	75.2	76	74.25	70.32	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Rudresh. S	76.4	77.8	64.6	62.34	1	1	1	1	1	1	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Rakshith	66.8	68	81.08	78.02	1	1	1	1	1	1	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Athira	59.7	60.7	47.61	41.23	1	1	2	2	1	1	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1
Shivamanjunath	71.7	73	36	34.26	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Madhav	62.2	63.5	58.67	56.23	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Guru. S	63.7	65	73.7	68.2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Priyanka	48	49.2	86.7	82.79	1	1	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	1	1	2	2	2	2	1	1
Sudhir	71.6	73	68.87	64.63	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Sumana	70	72	47.12	43.38	1	1	1	1	1	1	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Parna	43.3	44.8	52.24	47.63	2	2	1	1	1	1	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2
Chandana	47.2	49.3	38.65	35.12	1	1	1	1	1	1	2	2	2	2	1	1	1	1	2	2	2	2	1	1	2	2	2	2	2	2
Sudheshna	45.7	46.2	72.3	70.42	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Meenu Mohan	63.1	64.3	68.94	63.25	1	1	1	1	2	2	1	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2
Dibyajyothi Moharana	84.9	88.3	78.12	71.36	1	1	1	1	1	1	2	2	2	2	1	1	1	1	2	2	2	2	2	1	2	2	2	1	2	2
Anantu Sunil	78.6	79.4	104.89	97.62	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Siddharth	106.5	106	69.8	65.63	1	1	1	1	1	1	2	2	2	2	1	1	1	1	2	2	1	1	2	2	2	2	2	2	1	1
Prashanth Sharma	66.2	67.7	82.87	81.42	2	2	1	1	1	1	2	2	2	2	1	2	1	1	2	2	2	2	2	2	2	2	2	2	1	2
Shashikala	56.5	57.1	90.36	88.23	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Keya Sonawala	56.6	58	58.4	50.73	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	1	2
Apoorva K.S	60.5	61.6	82.41	70.62	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Ahana	49.7	51.2	98.3	92.68	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Deepika Srivatsa	45.3	46.2	72.3	70.42	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Name	roukshya BT	ROUKSHYA AT	shruma BT	SHRAMA AT	shosha BT	SHOSHA AT	glani BT	GLANI AT	shabda asahishnuta BT	SHABDA ASAHISHNUTA AT	snigdha BT	SNIGDHA AT	shlakshna BT	SHLAKSHNA AT	mridu BT	MRIDU AT	prasanna BT	PRASANNA AT	sukshma BT	SUKSHM AT	alpa BT	ALPA AT	gambheera BT	GAMBHEERA AT	sukumara loma BT	SUKUMARA LOMA AT	prabha BT	PRABHA AT
Divyashree	1	1	1	1	2	2	1	1	2	2	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	1	1	1
Madhushree	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mahesh	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	2	1	1
Vikram	1	1	2	2	2	2	2	2	2	2	1	1	2	2	1	1	1	1	1	1	2	2	1	1	1	1	1	1
Praveen Kumar	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	1	2	1	2	1	2	1	1
Susheel	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Naveen. B S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1
SriNagesh	2	2	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	1	1	2	2
Roza	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	2	2	1	1	1	1	2	2	2	2	1	2
Shilpashree	1	1	2	2	2	2	2	2	1	1	2	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1
Vishakha	1	1	2	2	1	1	1	1	1	1	2	2	2	2	1	1	1	1	2	2	1	1	2	2	2	2	1	1
Supriya	2	2	2	2	2	2	1	1	1	1	1	1	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2
Deepak Saini	2	2	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	2	2	1	1
Akash Gupta	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1
Chinmayee Chanat	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Anisha Khandelwal	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rajani Kagga	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	1	1	2	2
Yash Chouhan	1	2	2	2	2	2	2	1	2	2	2	2	2	1	1	1	1	1	2	2	1	1	1	1	2	2	1	1
Suraj	1	1	2	2	1	1	2	2	1	1	1	1	2	2	1	1	1	1	1	1	2	2	1	1	2	2	1	1
Apoorva Koteshwar	2	1	1	1	2	2	2	1	2	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Pradeep Kumar	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	2	2
Nimmi	2	1	2	1	2	2	1	1	2	2	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1
Poornashree	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1
Chethana	2	2	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1
Makarand	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	1	1	1	1
Devi	1	2	2	2	2	2	2	2	2	1	1	2	2	2	1	1	1	1	2	2	1	1	2	2	1	1	2	2
Madhura	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2
Naveen. V	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rudresh. S	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	1	2	1	2	1	2	1	1
Rakshith	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1
Athira	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2
Shivamanjunath	1	1	2	2	2	2	2	2	2	2	1	1	2	2	1	1	1	1	1	1	2	2	1	1	1	1	1	1
Madhav	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	1	1	2	2
Guru. S	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Priyanka	1	2	2	2	2	2	2	2	2	1	1	2	2	2	1	1	1	1	2	2	1	1	2	2	1	1	2	2
Sudhir	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	1	1	1	1
Sumana	2	2	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1
Parna	2	2	2	2	2	2	1	1	1	1	1	1	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	2
Chandana	1	1	2	2	1	1	1	1	1	1	2	2	2	2	1	1	1	1	2	2	1	1	2	2	2	2	1	1
Sudheshna	1	1	2	2	2	2	2	2	1	1	2	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1
Meenu Mohan	2	1	1	1	2	2	2	1	2	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Dibyajyothi Moharana	1	2	2	2	2	2	2	1	2	2	2	2	2	1	1	1	1	1	2	2	1	1	1	1	2	2	1	1
Anantu Sunil	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	2	2	2
Siddharth	2	2	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	2	2	1	1
Prashanth Sharma	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1
Shashikala	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Keya Sonawala	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Apoorva K.S	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1
Ahana	1	1	1	1	2	2	1	1	2	2	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	1	1	1
Deepika Srivatsa	1	1	2	2	2	2	2	2	1	1	2	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1

Name	ashraddha BT	ASHRADDHA AT	aruchi BT	ARUCHI AT	asya vairasya BT	ASYA VAIRASYA AT	arasagnata BT	ARASAGNATA AT	hrillasa BT	HRILLASAT	gouravа BT	GOURAVA AT	tandra BT	TANDRAAT	angamarda BT	ANGAMARDA AT	jwara BT	JWARA AT	tama BT	TAMA AT	pandutwa BT	PANDUTWA T	srotorodha BT	SROTORODHA T	klaibhya BT	KLAIBHYA AT	sada BT	SADA AT	krishangata BT	KRISHANGAAT	agni nasha BT	AGNI NASHA AT	vali BT	VALI AT	palita BT	PALITA AT
Divyashree	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	1	1
Madhushree	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mahesh	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Vikram	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Praveen Kumar	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Susheel	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Naveen. B S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
SriNagesh	2	2	2	2	2	2	2	2	1	1	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Roza	2	2	2	2	2	2	1	1	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2
Shilpashree	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Vishakha	2	2	2	2	2	2	2	2	2	2	1	1	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Supriya	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Deepak Saini	1	1	1	1	1	1	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	1	1
Akash Gupta	1	1	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Chinmayee Chamat	2	2	1	1	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	1	1	2	2	2	2
Anisha Khandelwal	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Rajani Kagga	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Yash Chouhan	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Suraj	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2
Apoorva Koteshwar	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2	1	1	2	2	2	2	2	2	2	2	1	1	2	2	1	1
Pradeep Kumar	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	1	1
Nimmi	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Poornashree	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Chethana	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Makarand	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Devi	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2
Madhura	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Naveen. V	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Rudresh. S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Rakshith	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Athira	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Shivamanjunath	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Madhav	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Guru. S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Priyanka	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2
Sudhir	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Sumana	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Parna	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Chandana	2	2	2	2	2	2	2	2	2	2	1	1	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Sudheshna	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Meenu Mohan	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2	1	1	2	2	2	2	2	2	2	2	1	1	2	2	1	1
Dibyajyothi Moharana	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Anantu Sunil	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2
Siddharth	1	1	1	1	1	1	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	1	1
Prashanth Sharma	1	1	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Shashikala	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Keya Sonawala	2	2	1	1	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	1	1	2	2	2	2
Apoorva K.S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Ahana	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	1	1
Deepika Srivatsa	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1

	LIPID PROFILE BEFORE AND AFTER TREATMENT										AGNI PAREEKASHA			JEERNA LAKSHANAS BEFORE AND AFTER STUDY AND AFTER 1 MONTH																		
NAME	cholesterol BT	cholesterol AT	TG BT	TG AT	HDL BT	HDL AT	LDL BT	LDL AT	VLDL BT	VLDL AT	abhyavakarana shakti BT	ABHYAVAHRANA SHAKTI AT	ABHYAVAHRANA SHAKTI 1M	Udgara Suddhi BT	UDGARA SHUDDHI AT	UDGARA SHUDDHI 1M	Utsaha BT	UTSAHA AT	UTSAHA 1M	Malotsarjana BT	MALOTSARJANA AT	MALOTSARJANA 1M	Mutrotsarjana BT	MUTROTSARJANA AT	MUTROTSARJANA 1M	laghuta BT	LAGHUTA AT	LAGHUTA 1M	Developing Hunger BT	DEVELOPING HUNGER AT	DEVELOPING HUNGER 1M	Developing Thirst BT	DEVELOPIG THIRST AT	DEVELOPIG THIRST 1M
Divyashree	160	137	73	83	32	27	114	94	14	16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Madhushree	149	151	72	82	29	30	106	105	14	16	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mahesh	195	198	99	102	39	39	137	140	19	20	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1
Vikram	193	195	120	130	42	41	144	148	24	26	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1
Praveen Kumar	192	195	131	135	44	44	145	148	26	27	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1
Susheel	192	196	155	160	44	42	116	122	31	32	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Naveen B. S	165	140	130	125	33	28	106	87	26	25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SriNagesh	198	199	164	170	44	42	122	123	32	34	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Roza	139	141	50	57	27	28	102	102	10	11	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Shilpashree	147	141	52	60	29	28	108	101	10	12	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Vishakha	190	188	69	71	38	37	139	137	13	14	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Supriya	163	140	86	61	32	28	114	100	17	12	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Deepak Saini	177	198	99	179	35	39	123	124	19	35	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Akash Gupta	199	189	98	95	40	37	143	133	19	19	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Chinmayee Chanat	160	162	52	57	32	31	117	116	12	12	1	1	1	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	2	1
Anisha Khandelwal	189	160	87	71	37	32	135	114	17	14	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rajani Kagga	120	135	86	93	24	24	79	93	17	18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Yash Chouhan	197	191	89	86	39	38	141	136	17	17	2	3	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Suraj	177	169	88	68	35	33	125	123	17	13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Apoorva Koteshwar	180	161	91	70	36	32	126	115	18	14	2	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1
Pradeep Kumar	192	188	89	81	38	37	137	135	17	16	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Nimmi	160	157	52	50	32	31	118	116	10	10	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Poornashree	149	142	90	84	29	28	102	98	18	16	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Chethana	157	147	101	98	31	29	106	99	20	19	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Makarand	188	192	94	109	37	36	133	135	18	21	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Devi	150	162	71	79	30	30	106	116	14	16	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1
Madhura	192	181	106	92	38	36	133	127	21	18	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Naveen. V	198	199	164	170	44	42	122	123	32	34	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rudresh. S	195	198	99	102	39	39	137	140	19	20	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1
Rakshith	192	195	131	135	44	44	145	148	26	27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Athira	120	135	86	93	24	24	79	93	17	18	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Shivamanjonath	193	195	120	130	42	41	144	148	24	26	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Madhav	177	179	99	102	35	35	123	127	19	19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Guru. S	192	195	131	135	44	44	145	148	26	27	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Priyanka	120	135	86	93	24	24	79	93	17	18	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1
Sudhir	177	179	99	102	35	35	123	127	19	19	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sumana	120	135	86	93	24	24	79	93	17	18	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Parna	140	163	61	86	32	28	100	114	12	17	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Chandana	188	190	69	71	38	37	137	139	13	14	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Sudheshna	141	147	52	60	29	27	101	108	10	12	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Meenu Mohan	161	180	70	91	36	32	115	126	14	18	2	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1
Dibyajyothi Moharana	191	197	86	89	39	37	136	141	17	19	2	3	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Anantu Sunil	188	192	81	89	38	37	135	139	16	18	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Siddharth	177	198	99	149	39	35	123	129	19	35	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Prashanth Sharma	189	198	95	98	40	37	133	143	19	19	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Shashikala	160	189	71	87	37	32	114	135	14	17	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Keya Sonawala	160	165	52	59	32	30	117	121	12	12	1	1	1	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	2	1
Apoorva K.S	142	162	84	90	29	28	98	102	16	18	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Akana	120	135	86	93	24	24	79	93	17	18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Deepika Srivatsa	147	141	52	60	29	28	108	101	10	12	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	BENEFITS OF SNIGDHA BHOJANA BEFORE AND AFTER STUDY AND AFTER 1 MONTH																							
NAME	Bhujyam aanam Swadate BT	BHUJY AMANA M SWADA TE AT	BHUJY AMANA M SWADA TE 1M	Agni Udirana BT	AGNI UDIRA NA AT	AGNI UDIRA NA 1M	Kshipra Jara BT	KSHIPR A JARA AT	KSHIPR A JARA 1M	Vatanulo mana BT	VATAN ULOMA NA AT	VATAN ULOMA NA 1M	Shariropc chaya BT	SHARIR OPACH YA AT	SHARIR OPACH YA 1M	Indriya Dhardhya BT	INDRIY A DARDH YA AT	INDRIY A DARDH YA 1M	Bala BT	BALA AT	BALA 1M	varna BT	VARNA AT	VARNA 1M
Divyashree	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	2	2	1
Madhushree	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mahesh	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Vikram	1	1	1	1	1	1	2	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Praveen Kumar	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Susheel	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Naveen B. S	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SriNagesh	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
Roza	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1
Shilpashree	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Vishakha	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1
Supriya	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Deepak Saini	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Akash Gupta	1	1	1	1	1	1	2	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Chinmayee Chamat	1	1	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	1	1	1
Anisha Khandelwal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rajani Kagga	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Yash Chouhan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	2	1	2	2	1
Suraj	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	2	1	1	1	1	1	1	1
Apoorva Koteshwar	1	1	1	1	1	1	2	2	1	2	2	1	1	1	1	2	2	1	2	2	1	1	1	1
Pradeep Kumar	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1
Nimmi	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2
Poornashree	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Chethana	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Makarand	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Devi	1	1	1	2	2	1	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1
Madhura	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Naveen. V	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rudresh. S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rakshith	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Athira	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Shivamanjunath	1	1	1	1	1	1	2	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Madhav	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Guru. S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Priyanka	1	1	1	2	2	1	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1
Sudhir	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sumana	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Parna	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Chandana	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1
Sudheshna	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Meenu Mohan	1	1	1	1	1	1	2	2	1	2	2	1	1	1	1	2	2	1	2	2	1	1	1	1
Dibyajyothi Moharana	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	2	1	2	2	1
Anantu Sunil	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1
Siddharth	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Prashanth Sharma	1	1	1	1	1	1	2	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Shashikala	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Keya Sonawala	1	1	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	2	2	1	1	1	1
Apoorva K.S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ahana	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	2	2	1
Deepika Srivatsa	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	RAKTA SARA LAKSHANA BEFORE AND AFTER TREATMENT																							QUESTIONNAIRE DOMAINS 1,2,3,4 BEFORE AND AFTER TREATMENT							
NAME	Kama BT	KARNA AT	Akshi BT	AKSHI AT	Mukha BT	MUKHA AT	Jihwa BT	JIHWA AT	Nasa BT	NASA AT	Oshtha BT	OSHTH AAT	Panitala BT	PANITA LA AT	Padatala BT	PADAT ALA AT	Nakha BT	NAKHA AT	Lalata BT	LALAT AAT	Mehana BT	MEHAN AAT	Shobhay ukta BT	SHOBH AYUKT AAT	BTdomai n 1	AT domain 1	BTdomai n 2	ATdomai n 2	BTdomai n 3	ATdomai n 3	BTdomai n 4	ATdomai n 4
Divyashree	1	1	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2			1	1	38	38	69	69	69	69	69	69
Madhushree	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	50	50	69	69	75	75	81	81
Mahesh	2	2	2	2	2	2	1	1	2	2	1	1	1	1	2	2	1	1	2	2	1	1	1	1	44	38	56	56	75	75	69	75
Vikram	2	2	2	2	2	2	1	1	2	2	1	1	1	1	2	2	1	1	2	2	1	1	1	1	38	38	50	56	81	81	75	75
Praveen Kumar	1	1	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	38	38	56	63	69	69	75	75
Susheel	1	1	2	2	2	2	1	1	2	2	2	2	1	1	1	1	1	1	2	2	2	2	1	1	44	44	63	63	75	75	69	63
Naveen B. S	1	1	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	56	56	69	69	94	94	81	81
SriNagesh	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	38	31	56	56	81	81	56	50
Roza	1	1	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	2			2	2	44	44	56	56	75	75	69	69
Shilpashree	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2			1	1	44	38	63	56	50	50	56	56
Vishakha	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	1	1	2	2			1	1	38	38	50	50	69	69	69	69
Supriya	2	2	2	2	2	2	1	1	2	2	1	1	1	1	1	1	2	2	2	2			2	2	44	50	63	69	75	75	69	75
Deepak Saini	2	2	2	2	2	2	1	1	1	1	2	2	1	1	2	2	1	1	2	2	2	2	1	1	31	31	44	44	69	69	63	63
Akash Gupta	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	31	31	69	63	44	44	81	81
Chinmayee Chamat	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1			1	1	31	31	63	63	50	50	81	81
Anisha Khandelwal	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2			1	1	56	56	81	81	75	75	75	75
Rajani Kagga	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1			1	1	44	44	81	81	81	81	75	75
Yash Chouhan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	38	38	44	44	75	56	81	75
Suraj	1	1	1	1	1	1	1	1	2	2	1	1	2	2	2	2	2	2	2	2	1	1	1	1	38	38	50	50	50	50	63	63
Apoorva Koteshwar	1	1	2	2	1	1	2	1	2	1	1	1	2	2	1	1	1	1	2	2			1	1	38	44	75	69	69	81	81	88
Pradeep Kumar	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	56	56	56	56	56	56	94	94
Nimmi	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2			1	1	56	50	63	63	69	69	69	69
Poornashree	2	2	2	1	1	1	1	1	2	1	1	1	2	2	2	2	1	1	2	1			1	1	44	44	69	69	69	69	69	69
Chethana	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2			2	2	38	38	56	63	75	75	81	81
Makarand	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	2	2	44	44	50	50	81	81	75	75
Devi	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2			1	1	38	38	69	63	69	69	56	56
Madhura	2	2	2	2	2	2	1	1	2	2	2	2	1	1	1	1	1	1	1	1			1	1	44	44	69	69	81	81	81	81
Naveen. V	1	1	2	2	2	2	1	1	2	2	2	2	1	1	1	1	1	1	2	2	2	2	1	1	44	44	63	63	75	75	69	63
Rudresh. S	1	1	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	38	38	56	63	69	69	75	75
Rakshith	1	1	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	56	56	69	69	94	94	81	81
Athira	2	2	2	2	2	2	1	1	2	2	2	2	1	1	1	1	1	1	1	1			1	1	44	44	69	69	81	81	81	81
Shivamanjunath	2	2	2	2	2	2	1	1	2	2	1	1	1	1	2	2	1	1	2	2	1	1	1	1	38	38	50	56	81	81	75	75
Madhav	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1			1	1	44	44	81	81	81	81	75	75
Guru. S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	50	50	69	69	75	75	81	81
Priyanka	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2			1	1	38	38	69	63	69	69	56	56
Sudhir	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	2	2	44	44	50	50	81	81	75	75
Sumana	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2			2	2	38	38	56	63	75	75	81	81
Parna	2	2	2	2	2	2	1	1	2	2	1	1	1	1	1	1	2	2	2	2			2	2	44	50	63	69	75	75	69	75
Chandana	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	1	1	2	2			1	1	38	38	50	50	69	69	69	69
Sudheshna	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2			1	1	44	38	63	56	50	50	56	56
Meenu Mohan	1	1	2	2	1	1	2	1	2	1	1	1	2	2	1	1	1	1	2	2			1	1	38	44	75	69	69	81	81	88
Dibyajyothi Moharana	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	38	38	44	44	75	56	81	75
Anantu Sunil	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	56	56	56	56	56	56	94	94
Siddharth	2	2	2	2	2	2	1	1	1	1	2	2	1	1	2	2	1	1	2	2	2	2	1	1	31	31	44	44	69	69	63	63
Prashanth Sharma	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	31	31	69	63	44	44	81	81
Shashikala	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2			1	1	56	56	81	81	75	75	75	75
Keya Sonawala	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1			1	1	31	31	63	63	50	50	81	81
Apoorva K.S	2	2	2	1	1	1	1	1	2	1	1	1	2	2	2	2	1	1	2	1			1	1	44	44	69	69	69	69	69	69
Ahana	1	1	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2			1	1	38	38	69	69	69	69	69	69
Deepika Srivatsa	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2			1	1	44	38	63	56	50	50	56	56

ISSN 2456-3110
Vol 7 · Issue 1
Jan-Feb 2022

JAiMS
INTERNATIONAL

Journal of Ayurveda and Integrated Medical Sciences

www.jaims.in

JAIMS

An International Journal for Researches in Ayurveda and Allied Sciences

Maharshi Charaka
Ayurveda

Indexed

Journal of
Ayurveda and Integrated Medical Sciences
ISSN 2456-3110
REVIEW ARTICLE Jan-Feb 2022

Critical analysis of *Goghrita* (cow ghee) and its action on *Rasa Dhatu*

Varuni SJ[1], Kalpana Sathe[2]

[1]*Ph.D. Scholar, Tilak Maharashtra Vidyapeeth, Pune. Maharashtra, India.*

[2]*Professor, Department of Kriya Shareera, All India Institute of Ayurveda, New Delhi, India.*

ABSTRACT

Ahara (food) plays an important role in our daily life. Food provides various health benefits. Ghee is one such *Snigdha Ahara Dravya* which is considered to be an integral part of the human diet in India since ages. Amount of consumption of ghee varies according to region, and individuals. The nutritious and therapeutic value in ghee is good. Every food item we consume encounters with *Agni* and results in the formation of *Ahara Rasa* and thus *Rasa Dhatu*. Even the ghee consumed will be making an entry in to the *Rasa Dhatu* thus circulating all over the body. *Rasa* which is considered as the *Aadya Dhatu* continuously circulates and forms the *Aadhara* for nourishment of consecutive *Shad Dhatus*.

Key words: *Ahara, Agni, Ahara Rasa, Goghrita, Rasa Dhatu, Sneha.*

INTRODUCTION

Every man aspires to live healthy and as long as possible. Ayurveda the science of life too has the same aim. *Ahara* (food), *Nidra* (sleep) and *Bramhacharya* (celibacy) are the three pivotal pillars to maintain a healthy life. Ayurveda explains that *Ahara* (food) plays an important role in our daily life. Among the *Ahara* (food) *Sneha* (unctuous substance) is considered as *Rasāyana* (rejuvenating) which means the intake of *Sneha* (unctuous substance) like *Ghrita* (cow ghee) rejuvenates the body and promotes longevity.

Nirukti

The word *Ghrita* (cow ghee) is derived from *"Ghriti Ghriyate Ghri Seke Anjighrisibhyah Ktah"* [1]

Ghrita Nishpatti - *Ghrita* (cow ghee) is used in the meaning of 'extracted from milk.'

Address for correspondence:
Dr. Varuni SJ
Ph.D. Scholar, Tilak Maharashtra Vidyapeeth, Pune. Maharashtra, India.
E-mail: contactdrvaruni@gmail.com
Submission Date: 12/01/2022 Accepted Date: 19/02/2022

Access this article online

Quick Response Code

Website: www.jaims.in

Published by Maharshi Charaka Ayurveda Organization, Vijayapur, Karnataka (Regd) under the license CC-by-NC-SA

MATERIALS AND METHODS

The article is based on the literary evidences of *Sneha* (unctuous substance), *Ghrita* (cow ghee), *Sneha Paka* (digestion of unctuous substance) and its effect on the *Dhatus* (major structural components of the body) as explained in the classical texts of Ayurveda.

METHODOLOGY

A detailed systematized analysis of the *Ahara Paka*, the effect of different kinds of *Agni* on the *Ahara* (food), the fate of *Sneha Dravya* (unctuous substance used for therapeutic purpose or health benefits) specifically - *Ghrita* (cow ghee) after its digestion reaching the *Rasa Dhatu* was done.

RESULTS

- With the increase in *Agni*, (*Deeptaagni*) (digestive fire), *Paka Prakriya* (process of digestion) happens properly this may stimulate the production of HDL molecules in other than primary site, (liver) such as epithelial cells of intestine.

ISSN: 2456-3110 REVIEW ARTICLE Jan-Feb 2022

- With the increase in HDL molecules it may increase the transport of cholesterol from tissues to the liver for metabolism which is a beneficial effect.

Analysis and Discussion

Ghrita (cow ghee) is said to be the best among all the *Jangama Snehās* because it is having a special property of adaptability, i.e., '*Samskārasyānuvartanam'*.

Qualities of *Goghrita* (cow ghee)[2]

- *Rasa* : *Madhura* (sweet)
- *Veerya* : *Sheeta* (cold)
- *Vipāka* : *Madhura* (sweet)
- *Guna* : *Snigdha* (unctuousness), *Sheeta* (cold), *Guru* (heavy), *Mridu* (soft), *Sowmya* (soft by nature), *Sūkshma* (minute), *Anabhishyandi* (which does not cause obstruction of channels), *Alpābhishyandi* (which mildly may cause obstruction of channels)
- *Doshaghnata* : *Vāta Pitta Shāmaka* (decreases *Vata* and *Pitta*), *Kaphakara* (increases *Kapha*)
- *Bhoutika Sanghatana* : Dominated by *Prithvi* (earth element) and *Ap* (water element).
- Chemical composition: 100% animal fat.

Among all types of *Ghrita* (ghee), *Goghrita* (cow ghee) is said be the best. *Goghrita* (cow ghee) acts as *Rasa Vardhaka* (increases *Rasa*) and also increases other components of the body such as, *Shukra* (semen), *Ojas* (essence of all *Dhatus*) etc.

Sneha Paripāka – According to Ayurveda

The knowledge of digestion and assimilation of *Sneha Dravyas* (unctuous substance used for therapeutic purpose or health benefits) is very important. But in Ayurveda, the *Pāka Krama* of *Sneha* (digestion of unctuous substance) is not vividly explained by *Āchāryas*. Hence, no clear references are available about the digestion of *Sneha Dravyas* (unctuous substance used for therapeutic purpose or health benefits). However, the process of *Sneha* (unctuous substance) digestion can be studied on the basis of *Sneha Jeeryamāna* (features seen during the digestion of ghee) and *Jeerna Lakshanās* (features seen after the digestion of ghee).

To understand the digestion process of *Snehās* (unctuous substance) reference has to be taken from the process as described by Charaka.[3] Any food item cannot be assimilated without proper elementary level digestion. This process is to be performed by three types of *Agnis*, viz *Jatharāgni* (digestive fire at the level of stomach), *Dhātwagni* (digestive fire at the level of tissues) and *Bhūtāgni* (digestive fire at the level of 5 basic elements).

In nut shell – The food, i.e., *Vijāteeya* form

Parinamana ↓ By means of *jatharāgni* and its representatives in *dhātus* etc.

Sajāteeya form

Parinamana ↓ *Dhātwagni* and *Bhūtāgni*

Formation of the body tissues

Agni digests the four types of *Ahara*[4] (food) and provides energy for sustaining life. It protects body from wear and tear. Hence *Agni* performs both the functions of digestion and metabolism.

Role of *Jatharāgni* on *Sneha Paripaka*

Jatharāgni is the leader of all factors concerned with digestion and metabolism in the body. The activities of all the normal and abnormal factors are dependent upon an increase or decrease of it.[5]

According to Charaka, the food which has reached the *Āmāshaya* (stomach and small intestine as *Urdhwa* and *Adho Amashaya*) after undergoing digestion is absorbed and distributed to all *Āshayās* in the body through *Dhamanies*.[6]

Here the term *Dhamani* literally means the channels of internal transport. Absorbed food is transported through small *Srotases* of intestine which proceeds to *Yakrit*, from where it is transported to the *Hridaya* and

ISSN: 2456-3110 REVIEW ARTICLE Jan-Feb 2022

it is distributed to all parts of the body through circulation.

Role of *Bhūtāgni* on *Sneha Paripaka*

According to Ayurveda, *Bhūtāgnipāka* follows *Jatharāgni Pāka*. Digestion of food by *Jatharāgni* leads to the *Sanghāta Bheda* or breakdown of the former into five distinct physiochemical groups viz *Pārthiva, Āpya, Tejasa, Vāyaviya*, *Nābhasa*. The *Agni Amsha* present in the substances belonging to each group is then said to digest the substance of that group leading to a radical change in their qualities- *Vailakshanya Guna*.[7] Thus, food substances are rendered fit for being assimilated into the corresponding *Bhoutika Shareera Dravya*.

According to Sushruta, the food which consists of five *Mahābhūtas* is digested in its turn by the *Bhūtāgnis* and each of its principles proceeds to augment its own analogue in the human organism.[8] According to some the reactions comparable to *Bhūtāgni Pāka* takes place in *Yakrit* (liver) and not in *Āmāshaya* (stomach) which drives the support to the post digestive functions and metabolic events in liver as per modern physiology and biochemistry.

Proceeding on the basis of Ayurvedic principle that the general (similar) or *Sāmānya* classifies and the particular (dissimilar) or *Vishesha* differentiates,[9] a *Pārthiva* substance can alone contribute to an increase of *Pārthiva* constituent of the body. *Sneha* (unctuous substance) is said to be *Āpya* substance. So, it increases the *Āpya* constituent in the body. According to Vāgbhata, *Sāra - Kitta Vibhajana* takes place after the completion of *Bhūtāgni Pāka*.

Role of *Dhātwagni* on *Sneha Paripaka*

The specific *Agni* corresponding to each *Dhātu* is called as *Dhātwagni*. *Dhātwāgni Pāka* is stated to metabolize the products of *Bhūtāgni Pāka*. *Rasāgni* is stated to aid in the structural synthesis of several constituents of *Rasa Dhātu*. Likewise the formation of the constituents of *Rakta Dhātu* is catalysed by *Raktāgni* and similarly in cases of *Māmsa* (muscle tissue), *Meda* etc. The nutrients that support the body are subjected to *Pāka* again, acted upon by the seven *Dhātwagnis*, leading to the formation of *Dhātus* through their respective *Srotases*.[10]

The substances produced in these reactions are known as *Asthāyi* or *Poshaka Dhātus*.[11] *Dhātwāgni Pāka* is said to have two aspects;

a) *Prasāda Pāka* and

b) *Kitta*

The end products of *Prasāda Pāka* are utilized for the nourishment of *Dhātus*, whereas, those of *Kitta* provide the materials for the formation of various kinds of excretions such as *Sweda* (sweat), *Mūtra* (urine), *Pureesha* (feces), *Vāta, Kapha, Karna-Nāsa-Āsya-Romakūpa Malas* (waste products in different orifices like ear, eyes) etc.[12]

The *Prasāda* (nutrient) fraction is transported by *Rasa* → *Rakta* (blood) – and so on to the next *Dhatus* (major structural components of the body).

The final synthesis of *Asthāyi Dhātus* (tissue elements not fully formed and attained compactness) into *Sthāyi Dhātus* (tissue elements that have fully formed and attained compactness) takes place in *Dhātu* themselves by the help of *Dhātwagnis*.

In Ayurveda, mode of digestion has also been agreed for where sequential digestion process may not take place. Many drugs may directly reach to the deeper *Dhātus*. Such drugs include *Vrishya Yogas* (drugs used for aphrodisiac purpose).

Applied study of *Agni* on *Sneha*

It can be said that while *Sneha* (unctuous substance) is taken internally, it changes in each stage of digestion. The *Sneha* (unctuous substance) after *Pāchana* (digestion) goes through the same chain which is explained as *Dhātwāgni* and *Bhūtāgni Vyāpāra*. The *Sneha Pāchana* (digestion of unctuous substance) requires the assimilation in the *Dhātus* – where the *Sneha* (unctuous substance) has to perform the functions according to its characteristics.

Ghrita (cow ghee) is one of the *Ahara Dravya* (food substance). So according to "*Rasapradhānam Āhāradravyam*, *Veerya Pradhānam Oushadham*" (food substances are predominantly having tastes and

ISSN: 2456-3110 REVIEW ARTICLE Jan-Feb 2022

therapeutic medicines are having potency in predominance), it will follow the same path of assimilation and will go from *Dhātu* to *Dhātu*[13] but exception exists in following two cases;

1) If it is imposed with some other medicinal properties, i.e., *Siddha* or *Samskārita Sneha Kalpana* (processed or treated with drugs), it will be diverted to the destination accomplished to the specific *Veerya - Kārmukata* (action based on potency) of the drugs.
2) If *Sneha Poshakāmsha* (substances which are similar in nature to unctuous substances) are more than the threshold in *Rasa Dhātu*, this extra quantity will directly reach to the deeper *Dhātus* like *Meda, Majja* etc.[14]

In case of *Brimhana Sneha* (unctuous substance administered for the purpose of enhancement of body tissues), *Khale Kapota Nyāya* (theory of selective absorption) is more suitable because here the *Dhātus* pick up only its *Poshaka Bhāga*. *Dhātus* are *Poshya* (nourish able) and *Poshaka* (nourished) is the site of action rendered to *Sneha* (unctuous substance). The *Poshaka Dhātu* in *Srotas* (channels) when acted upon by respective *Dhātwagni* and *Bhūtāgni* will play supportive or nutritive role for *Poshya Dhātu.*

Necessity of *Sneha* digestion

Sneha Dravyas (unctuous substance used for therapeutic purpose or health benefits) are not present in the nature of body elements, i.e., it is *Vijāteeya*. These are to be converted into the structure of the body and made suitable for assimilation, i.e., *Sajāteeya*. By the digestion of *Sneha* (unctuous substance) it becomes *Sajāteeya* by the action of *Agni*, which is later absorbed into the body structures which modify the *Sneha* according to their necessity for their build up and function.

Anupāna (after drink) also influences the digestion of *Sneha* (unctuous substance), warm water is used in case of *Ghrita* (cow ghee) which is *Sheeta Veerya* to make it quickly dispersible. Thus, *Anupāna* plays an important role by its virtues.[15]

The ingested *Sneha* after internally getting absorbed in the body will increase *Snigdha Guna* (unctuousness) Seven *Dhātus*, in which *Snigdha Guna* (unctuousness) is a co-existent factor, it will become strong and grow rapidly due to the additional *Sneha Guna* (unctuous property) of the *Sneha Dravya* (unctuous substance used for therapeutic purpose or health benefits) used. However, it should be noted that there is a threshold of assimilation of *Sneha* in the body.

The mode of consuming *Sneha* (unctuous substance) has an important role in rendering *Snehana*. Thus, *Prakshepa* (admixture), *Anupāna* (after drink), *Sevana Karma* (process of consumption), etc. also play an important role in influencing the action of *Sneha Dravya* (unctuous substance used for therapeutic purpose or health benefits).

Any *Dravya* (substance) possess *Guna* (properties) which can be understood as physical/chemical property and an effect which can be either a general action or therapeutic action. *Goghrita* (cow ghee) having the *Guna* such as *Snigdha* (unctuousness), *Sara* (fluid), *Mridu* (soft), *Drava* (liquid), *Shlakshana* (smooth), *Sheeta* (cold) and *Agneyatwa* (capacity to increase digestive fire) on interaction with the *Doshas* (body humours) and *Dhatus* (major structural components of the body) results in therapeutic actions like *Vata Pitta Hara* (decreases *Vata* and *Pitta*), *Brimhana* (nourishing for body elements), *Pushti* (nutrition), *Balya* (strengthening), *Rasavardhaka* (increases *Rasa*), *Shukravardhaka* (increases semen), *Agnivardhana* (increases digestive fire), *Hladana* (refreshing), *Ropana* (healing property), *Varnya* (which increases colour and complexion) etc. However, it is significant to note that the above therapeutic effects are predominantly favourable in nourishing the *Rasa Dhatu* as all the above therapeutic effects are conducive to *Rasa Dhatu*.

Further scope of study

An interventional study can be done by administering *Goghrita* (cow ghee) to one group of people and not administering to another group and comparison in the lipid profile parameters can be done to evaluate the actual effect of *Goghrita* (cow ghee).

ISSN: 2456-3110 REVIEW ARTICLE Jan-Feb 2022

Conclusion

Formation of *Dhatu* is the resultant of sustenance and nourishment of body from only *Sara Bhaga* of *Ahararasa*. Food has to undergo digestion by *Pachakagni*, then *Dhatwagni* (along with *Bhutagni*). Once after completion of *Paka Prakriya* the *Sarabhaga* of *Ahara* will be utilized for *Dhatu* formation after the action of *Dhatwagni*. *Dhatus* (major structural components of the body) become the medium through which all the functions of living body take place. So, considering the *Guna* (property)*, Karma* (function) and *Panchabhoutikatwa* of *Ghrita* (5 basic elemental properties of cow ghee) the critical analysis done on the concept of the effect of *Goghrita* (cow ghee) on *Rasa Dhatu* & inturn on *Medamsha* (lipid component) is found beneficial.

References

1. Abhimanyu shreemannalal, Amarakosha, Ramashrami commentary, Chaukhamba vidyabhavan, Varanasi, Reprint ed., 2011: pg. 320, 321
2. Acharya. J.T., Charaka Samhita of Charaka, Chakrapani commentary, Krishnadas academy, Varanasi, Reprint ed., 2000: P. 166
3. Acharya. J.T., Charaka Samhita of Charaka, Chakrapani commentary, Krishnadas academy, Varanasi, Reprint ed., 2000: P.174, 512
4. Acharya. J.T., Charaka Samhita of Charaka, Chakrapani commentary, Krishnadas academy, Varanasi, Reprint ed., 2000: P.174
5. Acharya. J.T., Charaka Samhita of Charaka, Chakrapani commentary, Krishnadas academy, Varanasi, Reprint ed., 2000: P. 516
6. Acharya. J.T., Charaka Samhita of Charaka, Chakrapani commentary, Krishnadas academy, Varanasi, Reprint ed., 2000: P. 238
7. Acharya. J.T., Charaka Samhita of Charaka, Chakrapani commentary, Krishnadas academy, Varanasi, Reprint ed., 2000: P.513
8. Acharya J.T., Sushruta Samhita, Nibandha sangraha commentary, chaukhamba surbharati prakashan, Varanasi, Reprint ed., 2008; P. 253
9. Acharya. J.T., Charaka Samhita of Charaka, Chakrapani commentary, Krishnadas academy, Varanasi, Reprint ed., 2000: P. 9,10
10. Acharya. J.T., Charaka Samhita of Charaka, Chakrapani commentary, Krishnadas academy, Varanasi, Reprint ed., 2000: P. 461
11. Acharya. J.T., Charaka Samhita of Charaka, Chakrapani commentary, Krishnadas academy, Varanasi, Reprint ed., 2000: P. 514
12. Acharya. J.T., Charaka Samhita of Charaka, Chakrapani commentary, Krishnadas academy, Varanasi, Reprint ed., 2000: P. 515
13. Acharya. J.T., Charaka Samhita of Charaka, Chakrapani commentary, Krishnadas academy, Varanasi, Reprint ed., 2000: P. 515
14. Acharya. J.T., Charaka Samhita of Charaka, Chakrapani commentary, Krishnadas academy, Varanasi, Reprint ed., 2000: P. 515
15. Paradakara Hari shivadasa shastri, Ashtanga hridaya of Vagbhata, Sarvanga sundara & Ayurveda Rasayana commentary, Chaukhamba Surbharati Parakashan, Varanasi, Reprinted., 2007, p. 159

How to cite this article: Varuni SJ, Kalpana Sathe. Critical analysis of Goghrita (cow ghee) and its action on Rasa Dhatu. J Ayurveda Integr Med Sci 2022;1:212-216.

Source of Support: Nil, **Conflict of Interest:** None declared.

****

wjpmr, 2022,8(3), 293 – 295.

WORLD JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.wjpmr.com

SJIF Impact Factor: 5.922

Review Article

ISSN 2455-3301

WJPMR

A GLIMPSE OF PRINCIPLES OF CHEMISTRY IN AYURVEDA

***[1]Dr. Varuni S. J., [2]Dr. Jalindar Dhamale and [3]Dr. Kalpana Sathe**

[1]PhD Scholar, Tilak Maharashtra Vidyapeeth, Pune. Maharashtra, India.
[2]Professor, Department of Kriya Shareera, Sri Sri College of Ayurvedic Science and Research, Bangalore, Karnataka, India.
[3]Professor, Department of Kriya Shareera, All India Institute of Ayurveda, New Delhi, India.

***Corresponding Author: Dr. Varuni. S. J.**
PhD scholar, Tilak Maharashtra Vidyapeeth, Pune. Maharashtra, India.

Article Received on 17/01/2022 **Article Revised on 07/02/2022** **Article Accepted on 27/02/2022**

ABSTRACT

Ayurveda is an age old science that encompasses several branches of science. Rasashastra is a branch which deals with metals, minerals gems its purification, and conversion of them into bhasma forms so that it can be administered internally. Ayurveda uses herbal, herbo-mineral, and animal items to treat a variety of illnesses. These substances act due to their chemical properties, and chemistry is the study of these principles itself.

INTRODUCTION

Ayurveda is a vast ancient knowledge involving varied branches of science. It has in it a treasure of knowledge hidden in the form of *shlokas* said by great Acharya's (authors of Ayurvedic texts).

Chemistry is a branch of the natural sciences dealing with the composition of substances and their properties and reactions.[1]

In Ayurveda, treatment of various disorders is done by using herbal, herbo –mineral and animal products. These substances act due to their chemical properties and study of these principles is nothing but chemistry.

Basic Principles of Ayurveda and Chemistry

There are mainly few basic principles which are the foundations, on which Ayurveda has been explained. One such principle is the theory of *PanchaMahabhuta*,[2] the five basic essential elements – *Akasha* (ether), *Vayu* (air), *Agni* (fire), *Jala* (water) and *Prithvi* (earth).

The *Panchamahabhuta* is a Sanskrit word composed of three words i.e. *Pancha*, Maha and *Bhuta*. *Pancha* means five elements, *Maha* means that which is enormous and *Bhuta* means that having their own existence. It is enormous and yet so minute. It is said that there is no existence of any substance in this universe which is devoid of *Panchamahabhuta*. According to modern chemistry atoms are the smallest particles of every substance. This theory of *Panchamahabhuta* holds good at the atomic level too.

In an atom there is presence of protons and neutrons within the nucleus at the center. Electrons are revolving around the nucleus in its definite orbit.[3]

- The protons and electrons carry a charge and this energy is responsible for the function of the atom which can be said as the inherent character of *Agni Mahabhuta*.
- Protons and electrons are having a definite bonding between them. This property is because of the presence of *Jala Mahabhuta* which is having the capacity of bonding as its inherent character.
- Every atom has got a definite mass which is depicted in the form of atomic mass number.[4] This can be compared to the Pruthvi *Mahabhuta* which is having the property of heaviness.
- Electrons which are continuously moving around the nucleus in definite orbits can be compared to the property of *Vayu Mahabhuta* which is moving continuously.
- Irrespective of its size every atom occupies some space in universe. This is nothing but the innate property of *Akasha Mahabhuta* (ether element).

All substances are made up of atoms and atoms are made up of *Panchamahabutas*. So for every creation of a substance, these *Panchamahabhutas* are most essential.

Another basic principle in Ayurveda is "*loka purusha samya vada*"[5] which means there is similarity between universe and the human body. This same principle can be viewed through chemistry as, -

- Approximately 75% of earth's surface area is covered by water (hydrosphere)[6] Similarly we can find 60 – 70 % of water in the human body also in

the form of ICF (Intra cellular fluid) and ECF (Extra cellular fluid).[7]

- In the universe we find nitrogen as the most abundantly available element. Similarly in human body it is present in almost same proportion, in the form of proteins (amino acids).
- Iron and calcium are also present more or less in same percentage in the universe and also in our body.

Chemistry in Ayurvedic pharmacology

In the preparation of medicines in the form of *asava* and *arishta*, (syrup based fermented preparations) a drug, *Dhataki pushpa* (*Woodfordia fruticosa*) is added which acts as catalyst and also helps to fasten the process of fermentation,[8] as it contains yeast colony. In the preparation of these *asava* and *arishta*, the yeast colony acts over the sugars which are one of the ingredients added in various forms (jaggery, honey, sugar, sugar candy) and convert it into different forms of alcohol. This process of converting sugar into alcohol is based upon the principles of organic chemistry. In this process of fermentation, alcohol is being self-liberated and this itself is acting as the best preservative and enhances the shelf life and potency of the medicines.

In other forms of medicines like *kashaya*, (decoctions) the active principle of the drug is extracted by boiling the drug with water. This aqueous extract is also useful, not only as internal medication but also used externally for wound cleaning and other processes. This process of extraction of medicine is based on the principle of diffusion of modern chemistry.

These are done by two ways

1. Extraction of medicine in the self-liberated alcohol and
2. The aqueous extraction of medicine

These are based on the principles of organic chemistry. Extraction of active principles using different types of solvents (alcohol, water, fats etc) facilitates the drug to reach its target organs.

The preparation of certain medicines (*gomutra arka*, *ajamoda arka* etc) in Ayurvedic pharmacy is based on the distillation and condensation techniques of modern chemistry. Such preparations are called as *Arka* which are concentrated aqueous extracts of drugs having volatile active principles.[9]

Ayurveda and Nano Technology

Rasashastra is a part of Ayurveda in which the explanation regarding processing of various metals including mercury and its combination with herbs to treat illness is described. Metals are processed and purified using various herbs and then converted into *bhasma* (ash form) which are the smallest organic particles of the same metal, and used as herbo mineral medicines. In the light of recent advancement in the treatment of cancer, modern science uses nano therapy (smallest particle which easily enters cells). In this therapy they use a whole metal in the form of nano particle which is the basic idea behind *Bhasmas*. Today's latest technology of modern science was known and practiced by Ayurveda scholars thousands of years before.

Certain metals like platinum which are not mentioned in the texts of Ayurveda, were later found and used for various purposes. Ayurveda *vaidyas* today have started using these metals by following the purification process and converted them into *bhasma* form, and have succeeded in treating diseases like leukemia.

In the process of medicine preparation few drugs needs to be purified before its usage internally. This process is based more or less on modern chemistry.

For example – *Sudha Varga* [10] (substances made up of various forms of salts of calcium such as conch shell oyster, coral etc.) which is predominantly alkaline in nature is purified with the help of *amla varga dravyas* (drugs having sour taste) because they are acidic in nature.

We know that acid neutralizes alkalis and thereby render it purified and neutralized so as to administer in the form of *bhasmas* (ash form) in treating various disorders.

In GIT (gastro intestinal tract) disorders such as hyperacidity due to gastric mucosal irritation, these *bhasmas* of *sudha varga* are the drug of choice in treating them.[11]

Alchemy in Ayurveda

Rasashastra during its development produced various byproducts in the process of converting inferior metals into gold. Then in those days, *Rasavaidyas* even knew "***Dhatuvada***"[12] the art of transmuting the inferior metals into gold. For this purpose mercury (Hg) which is the only metal in liquid state with the atomic number 80[13] was chosen. Gold (Aurum - Au) is having the atomic number as 79 as mentioned in the periodic table.[14] By removing one electron through various processes mercury was converted to gold. But since gold was one of the costliest metals then and now, for which humans are constantly aspiring for it, this was kept as hidden secret in the books of *Rasashastra*.

Earlier the natural resources of inorganic compounds were easily available. With the advancement of time and extensive usage of these resources by man, it has become difficult to procure. Providing artificially prepared inorganic compounds to fulfill the requirement of current demands of these inorganic compounds, is the greatest contribution of chemistry to Ayurvedic Pharmacology. For example – artificial preparation of *tuttha* (copper sulphate), *kankshi* (alum potash), *tankana* (borax) etc.

Metals are not available in its purest forms and are mixed with impurities. To get rid of these impurities certain purificatory procedures are mentioned in Ayurvedic texts. Modern chemistry has made available the purest forms of metals, wherein these purificatory procedures mentioned in Ayurvedic texts are no longer essential. This is a significant contribution of modern chemistry in Ayurvedic fraternity.

CONCLUSION

"*Ekam shastram adheeyano na vidyaat shaastra nishchayam*"[15]

Thus Ayurveda emphasizes on the fact that knowledge of only one science is not sufficient. Multidisciplinary knowledge is most essential to be competent in today's world. Both chemistry and Ayurveda are having well established interdependent relationship with one another. With the development of newer technology in modern chemistry, it would be helpful to putforth Ayurveda as anticipated by modern fraternity.

REFERENCES

1. https://www.wordwebonline.com/en/CHEMISTRY
2. Sushruta Samhita, Ayurveda Tattva Sandipika, Hindi Commentary, 11th edition. Editor, Kaviraja Ambikadutta Shastri, Chaukhamba Sanskrit Bhavana Varanasi, 1997; 338.
3. https://courses.lumenlearning.com/introchem/chapter/the-bohr-model
4. https://en.wikipedia.org/wiki/Mass_number
5. Acharya. J.T., Charaka samhita of Charaka, Chakrapani commentary, chaukhamba surbharati prakashan, Varanasi, Reprint ed., 2008; 32.
6. https://gpm.nasa.gov/education/articles/earth-observatory-water-cycle-overview.
7. K. Sembulingam, Prema Sembulingam, Essentials of Medical Physiology, New Delhi, Jaypee Brothers Medical Publishers, 8 th edition, 51.
8. Ayurveda sara sangraha, Nagpur, Shri Baidyanath Ayurveda Bhavana private limited, 2004; 617.
9. Ayurveda sara sangraha, Nagpur, Shri Baidyanath Ayurveda Bhavana private limited, 2004; 557.
10. Dr. P Sekhar Reddy, A Text Book of Rasashastra, Varanasi, chaukhambha orientalia, 1st edition, 376.
11. Dr. P Sekhar Reddy, A Text Book of Rasashastra, Varanasi, chaukhambha orientalia, 1st edition, 381.
12. Dr. Nishchita, Dr. Dharshini Yadav & Dr. Kashyap Kasmin, A critical review on concept and relevance of Dehavada and Dhatuvada, WJPPS, 2020 May 24; 9(6):
13. https://pubchem.ncbi.nlm.nih.gov/periodic-table/
14. https://pubchem.ncbi.nlm.nih.gov/periodic-table/
15. Sushruta Samhita, Ayurveda Tattva Sandipika, Hindi Commentary, 11th edition. Editor, Kaviraja Ambikadutta Shastri, Chaukhamba Sanskrit Bhavana Varanasi, 1997; 18.

Nutritional Information Per 100 g*	
Energy, kcal	897
Fat, g	99.7
Saturated Fat, g	65
Trans Fat, g	2.5
Cholesterol, mg	300
Protein, g	0
Carbohydrate, g	0
Vitamin A, μg	700

* Approximate values

Cow ghee under the brand name “Nandini” given to the study participants of trial group.

Bottled ghee along with spoon

Study participants performing Harvard step test

Pulse examination after performing Harvard step test