“COMPARATIVE STUDY OF EFFECT OF NIRGUNDI PATRA PINDA SWEDA AND NADISWEDA IN KATISHOOL .”

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Submitted By

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Under the Guidance of

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CERTIFICATE

This is to certify that the thesis entitled, **"Comparative study of effect of Nirgudi Patra Pinda Sweda and Nadisweda in Katishool ."** which is being submitted herewith for the award of the Degree of Vidyavachaspati (Ph.D.) in department of Ayurveda of Tilak Maharashtra Vidyapeeth, Pune is the result of original research work completed by Shri. Ravikumar Bhagawan Patil under my supervision and guidance. To the best of my knowledge and belief, the work incorporated in this thesis has not formed the basis for the award of any Degree or similar title of this or any other university or examining body upon him.

Place: Pune

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Dr.Ravikumar B.Patil

Ph.D. (scholar) Panchakarma.

DECLARATION BY STUDENT

I hereby declare that the thesis entitled, **"Comparative study of effect of Nirgudi Patra Pinda Sweda and Nadisweda in Katishool ."** 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.

Place: Pune

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ABSTRACT

“Comparative study of effect of Nirgudi Patra Pinda Sweda and Nadisweda in Katishool .”

In a normal daily life, living without ambulation is almost impossible for any human being, from the time immemorial to ultramodern life.

Low back pain is a miserable condition which creates obstacle in living of person. Low back pain is the most common cause contributing to a large number of lost work days and disability claim. According to a survey, low back pain is extraordinarily common, and second only to the common cold. There are a number of surveys in multiple countries that reveal a point-prevalence of 17–30%, a 1-month prevalence of 19–43% and a lifetime prevalence of 60–80% and an annual incidence of 5%.

Term katishoola has elaborated in classics of Ayurveda suggesting pain at low back.

The word Katishoola is originated from the union of two words viz., kati and shoola. The word Kati signifies the region of low back. The term shoola is indicative of pain. Hence the occurrence of pain at low back, which in turns restrict the normal movement is called as katishoola.

Swedana is the process to induce sweating in a person. This procedure relieves shoola, stambha, gourava, sheeta & induces sweda. Patra pinda sweda is the procedure in which the sudation performed by specially prepared bundle of medicinal leaves. Nadi sweda is a kind of sudation in which medicated steam is applied to the patient’s body.The nirgundi is having a vatahara, shulhara property. It relieves the pain, stiffness.

The present study is a comparative study to assess the efficacy of nirgundi patra in the form of pinda sweda and nadi sweda in katishoola. The 106 patients were randomly divided in two groups.The assessment were done before, after treatment and at follow up by using parameter as schobers test, lateral flexion, rotation, flexion, pain and tenderness.

The study has shown a significant improvement clinically and statistically among both groups. Both groups have shown significant improvement in all the parameters as before treatment and after treatment. Also the improvement was persisting till follow-up in all the parameters. Except in group B treated with nirgundi

patra nadi sweda, in OLB score it was shown that effect of therapy was declining till follow-up in comparison with after treatment. In concern with the samyaka swedana lakshanas, sheetavyuparama and swedasrava observed since first day. Shoolavyuparama observed significantly earlier for nadisweda than pindasweda. Stambhanigraha, gouravanigraha and laghutva observed significantly earlier for pindasweda than nadisweda. Both swedana procedure required equal duration for the onset of vyadhihani.

Key words: katishoola, low backpain, nirgundi, pinda sweda, nadi sweda.

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LIST OF GRAPHS

ABBREVIATIONS

- A. S. Ashtanga Sangraha
- A. H. Ashtanga Hridaya
- A.T. After Treatment
- B.T. Before Treatment
- B.P. Bhavaprakasha
- B.R. Bhaishajya Ratnavalli
- B.S. Bhela Samhita
- C. S. Charaka Samhita
- C. D. Chakra data
- G.N. Gadanigraha
- H.S. Harita samhita
- K. S. Kashyapa Samhita
- M.N. Madhvan Nidanam
- Ni. R. Nighantu ratnakar
- S.S Sushrutha Samhita
- Sh.Sa Sharangadhara Samhita
- Y.R Yoga Ratnakara

1.1 INTRODUCTION

Ayurveda an ancient Indian wisdom stands apart from the rest of medical fraternity with its holistic and encompassing approach towards the prevention of disease and disease management. Ayurveda originated as a part of Vedic science that provides a comprehensive understanding of the entire universe of matter, mind and consciousness. Ayurveda has been in vogue since the Vedic period. It emphasizes on the maintenance and promotion of health as well as curing of diseases. Daily regimen, seasonal regimen, social ethics, diseases and their treatment, in such a way in detailed description is elaborated throughout the classics of Ayurveda. This science helps in upholding the physical, mental, and social health of living beings.

The health is basic need for all human being to achieve the four pursuit of life viz. dharma, artha, kama, moksha. Health of any individual depends on proper diet, way of living, personal behaviour and hygiene. Any lacuna in this routine may lead to disturbance of homeostasis and causes diseases.

In a normal daily life, living without ambulation is almost impossible for any human being, from the time immemorial to ultramodern life.

Low back pain is a miserable condition which creates obstacle in living of person. Low back pain is the most common cause contributing to a large number of lost work days and disability claim.

The importance of back pain in world is underscored by the following:

- The annual social cost of back pain in the United States is estimated to be between $20 and $50 billion.
- Back symptoms are the most common cause of disability in patients under 45 years of age.
- 50% of working adults, in one survey, admitted to having a back injury each year and
- Approximately 1% of the U.S. population is chronically disabled because of back pain.

According to a survey, low back pain is extraordinarily common, and second only to the common cold. There are a number of surveys in multiple countries that

reveal a point-prevalence of 17–30%, a 1-month prevalence of 19–43% and a lifetime prevalence of 60–80% and an annual incidence of 5%.

Back pain is usually felt in the lumbar area. Spinal stiffness, difficulty in the activities of daily living is the other presenting symptoms.

Term katishoola has elaborated in classics of Ayurveda suggesting pain at low back.

Swedana is the process to induce sweating in a person. This procedure relieves shula, stambha, gourava, sheeta and induces sweda.Nadi sweda is a kind of sudation in which medicated steam is applied to the patient's body. Patra pinda sweda is the procedure in which the sudation performed by specially prepared bundle of medicinal leaves.

The Nirgundi is having a vedanasthapaka, shothahara vatahara, shoolhara property. It relieves the pain, stiffness.

As the medical science recognizes the severity, a medicament that relieves the pain, improves the functional ability, restore from functional disability and controls the condition with cost effectiveness is the need of present era.

Despite the staggering annual costs of back pain to society there is paucity of well controlled clinical trials in the area of lowback pain i.e. katishoola.

Functional disability, sleep disturbances, fatigue and medication abuse are seen in people. In one study it has been quoted that 40% of back surgeries fail and even in successful surgeries, pain and subsequent disability have returned after a variable period of 6 months to 20 year.

By considering these things, the work has been carried out to study the effect of swedana by using nirgundi patra. In the form of pinda sweda and nadi sweda in katishool.

The samyaka swedana laxanas are important to understand the proper sudation process. There are many research work has been carried out incorporating the swedana procedure as a chief treatment modality. But the study on assessment of proper sudation therapy remained greatly ignored. So here along with the study of effect of swedana by using nirgundi patra an additional effort has been done to study the samyaka swedana laxanas i.e. parameters of proper sudation therapy.

In this comparative clinical study, patients were selected, placed randomly under two groups. One group received nirgundi patra pinda sweda and another with nirgundi patra nadi sweda.

This clinical study is a sincere effort to understand the applicability of nirgundi patra in the form of pindasweda against nadi sweda. Along with this an effort has been made to assess the samyaka swedana laxanas i.e. parameters of proper sudation therapy. It is also hoped that this work will pave new avenues for enthusiastic research workers to further advance in this field and find a better cure for this calamity. With this noble intention, this work is presented.

1.2 AIM AND OBJECTIVES

Aim: "Comparing the effect of nirgudi patra pinda sweda and nirgudi patra nadisweda in katishool."

Objectives:

1. Assessment of shulahara property of nirgundi in the form of pindasweda against nadisweda.
2. To study the observations of samyak swedana laxanas.

2 LITERATURE REVIEW

2.1 Procedure Review:

Historical review :

Vedas : In Gopatha Brahmana the sweda has been described as the sweat of God and it is responsible for saline taste of the sea water. Swedana as a therapeutic procedure has been not mentioned directly but fire described as a destroyer of rakshasa's. Apart from this the applicability of fire in different disorders has been elaborated.[1] These are suggestive of the karmukata of swedana therapy.

Puranas : In agnipurana mentioned that the vahni is considered as best for swedana .[2]

Samhitas :

Charaka samhita:

- The description of swedana is elaborated indetail in sutrasthana 14th chapter.[3]
- Swedana has been mentioned as a bahiparimarjana chikitsa.[4]
- One among the shadvidha upakramas the swedana has highlighted.[5]
- Among the agrya dravyas swedana has been indicated as agrya in 'mrudukaraanaam shreshtam'.[6]
- Different kinds of swedana and their importance mentioned in vaatavyadhi.[7]
- Different drugs for swedana, pindasweda and nadisweda in vatavyadhi has been stated.[8]
- Swedopaga dashemani gana has been explained.[9]
- Swedana has been indicated for vaatakaphaja vikaras.[10]
- In case of purification process for the elimination of vitiated doshas importance of swedana for liquifaction of doshas in minute channels has been explained.[11]
- In kustha chikitsa(sthira kathina mandala), vidarika,shuskarshas-Acharya mentioned pindasweda/ pottali sweda which indicates as sthanika sweda.[12]

Sushruta samhita :

- In detailed description of swedana in 32nd chapter-chikitsa sthana has been explained.[13]
- The chaturvidha classification of swedana is a main contribution from sushruta samhita.[14]
- In vaatavikara, snehana and swedana is a principle line of treatment.[15]

- The swedana karma has been included one among the sixty upakramas.[16]
- The applicability of swedana as a poorvakarma, pradhan karma and paschat karma has been described.[17]
- Aacharya Dalhana elaborated that the sankara sweda is one which is performed in the form of pottali.[18]
- As external therapies pindasweda elaborated in diseases like karnagata roga, gulma. [19]

Ashtanga Sangraha:

- In sutrasthana a separate chapter described about swedana.[20]
- The description of types of swedana, sweda vidhi, swedana arha, swedana anarha, samyak lakshana of swedana is present.[21]
- In vatavyadhi chikitsa specifically mentioned that snehayukta sweda relieves stiffness and contractures this indicates the importance of swedana followed by snehana.[22]
- Acharya considered pindasweda as sankara sweda and ushmasweda whereas nadisweda as drava sweda.[23]

Ashtanga Hridaya:

- The swedana has been described in separate chapter which is inclusive of different types of sweda, indication of sweda, contraindication of sweda, signs of proper, improper and hyper sudation.[24]
- In vatavyadhi chikitsa described that the snehayukta sweda is beneficial in stiffness and contracture.[25]

Sharangadhara Samhita:

- In uttarakhanda there is indetailed description of swedana.[26]
- While describing the upanah sweda some medicines for pindasweda has been described.[27]

Bhavaprakasha:

- In a chapter swedavidhi adhyaya detailed description of swedana has been done.[28]

Kashyapa samhita:

- In sutrasthana the description of swedana has been elaborated.[29]
- Mrudu sweda for children is one of the unique contribution along with the classification of swedana.[30]

Bhela Samhita:

- In sutrasthana there is description about swedana.[31]
- The diseases indicated for swedana along with paarshva roga has been described.[32]

Chakradatta:

- In a chapter swedadhikara indetail description of types of swedana, indications, contraindications, proper sudation has been described.[33]

Vangasena:

- The description swedana is present as a separate chapter.[34]

Harita samhita:

Acharya described the swedana therapy in separate chapter in detail, in this context also mentioned the importance of snehayukta swedana.[35]

- The swedana has been described as a type of langhana.[36]

Bhaishajya Ratnavali:

In vatavyadhi chikitsa described the snigdha sweda as principle line of treatment and pathya.[37]

- The pinda sweda is sukhavah in shoola roga.[38]
- In gulma the yava is mentioned for pinda sweda.[39]

Gadanigraha:

- In gadanigraha the separate chapter on sweda vidhi has been explained.[40]

Kalyaanakaaraka:

- The description of swedana is available in two different contexts. [41]
- In karnaroga dhaanyagana siddha pottali sweda has been mentioned in.[42]

Anandakanda:

- The description of swedana is available in brief.[43]
- The swedana has been one among the parada samskara.[44]

Etymology of swedana:

स्विद् भावे घञ् । (पुं)

घर्मे गात्रादितो जलादेः निस्यन्दने ।

णिच् भावे अच् ।[45]

The word sweda is 'पुं 'लिङ्ग derived from the 'Swid' dhatu after applying 'घञ् 'pratyaya and भाववाचक 'निच्' which means fluid perspiration from the body.

स्विद् णिच् ल्युट् (नपुं)

गात्रादितो घर्मादेःनिस्सारण व्यापारे ।

स्वेद शब्दे दृश्यम् ।[46]

The word sweda is नपुं लिङ्ग derived from the 'Swid' dhatu after applying ल्युट् pratyaya and भाववाचक निच् which means the procedure which brings out sweda through the body by sunlight etc. Hence the word **'**swedana' refers to 'procedure' and 'sweda' refers to one of the **'**constituent**'** of the body.

Definition:

Swedana is the procedure which destroys the sthambha,gourava,sheetata and which brings out the perspiration.

स्तम्भगौरव शीतघ्नं स्वेदनं स्वेदकारकम् ।[47]

स्वेदकारकं घर्मकारकम् । [48]

Swedana also referred as a fomentation, the act of heating or sweating.

शरीरेन सह अग्नेः संयोगः तापनं स्वेदनम् ।[49]

The process by which perspiration is bringing about in the body by the contact of heat is called as swedana.

Utility of Swedana: The applicability of swedana includes the different aspect.

- Swedana is useful in the disorders of vata,kapha origin.[50]
- It is one among the 18 samskara of parada.
- As a pakabheda in oushadha and ahara kalpana.[51]

- Kleda is the fluid principle of human body, it is a representative of jala mahabhoota . The sweda bears this kleda in human body.[52]
- Sweda can be utilized in Trividha Karma-

  As a poorvakarma:[53] Before vamana virechana as a shodhananga sweda

  As a pradhanakarma:[54] Like in vataja vyadhis - shamananga sweda.

  As a Paschatkarma:[55] Its useful in case of shalyapaharana, moodhagarbha.

  As a poorvakarma and paschatkarma:[56] Incase of surgical disease like bhagandhara.

Classification:

Charaka:

In charaka samhita the swedana is basically classified into two types,

a) Saagni sweda [57] again classified into 13 types.

b) Niragni[58] again classified into 10 types.

Each one of these saagni and niragni sweda can be further grouped under the following varities :[59]

Based on intensity: Mrudu, Madhyama, Mahan

Based on sthaana: Sarvaanga, Ekanga

Based on guna: Snigdha, Ruksha

In charakasamhita stated that, sankara sweda can be considered as pinda sweda.[60]

Sushruta:[61]

The swedana is classified in four types as tapa, upanah, ushma and drava. Aacharya dalhana stated that all the thirteen types of saagni sweda mentioned by Acharya Charaka are incorporated in this four types.[62]

Saagni Sweda

Taapa: Jentaaka, Karshu, Kuti, Koopa, Holaka.

Ushma: Sankara, Prastara, Ashmaghana,Nadi, Kumbhi, Bhoo.

Drava Sweda: Parisheka, Avagaha.

Upanaaha Sweda.

Niragni Sweda[63]

The niragni sweda is classified into 10 types.

Dalhana mentioned 2 sweda varieties:[64]

a)Samshamaniya b)Samshodhanangabhoota

Acharya Dalhana considered sankara sweda under upanaha sweda and is done in the form of pottali.[65]

Asthanga Samgraha: [66]

Agneya Sweda:

Ushma Sweda: Pinda, Samstara, Nadi, Ghanashma, Kumbhi, Koopa, Kuti, Jentaka .

Drava Sweda: Parisheka, Avagaha.

Anagneya Sweda: [67] Nivatagraha, Gurupravarana, Muhur madyapana, Vyayama, Kshudha, Bharaharana, Niyuddha, Aatapa, Adhwa, Amarsha.

Asthanga Hridaya: [68]

Saagni Sweda: Taapa, Upanaha, Ushma, Drava

Anagneya Sweda: [69] Nivatagrha, Gurupravarana, Aayaasa, Bhaya, Upanaha, Ahava, Krodha, Bhooripana, Kshudha, Aatapa.

Arunadatta later stated as, under the ushma sweda we can consider pindasweda and sankara sweda.[70]

Kashyapa: [71]

In Kashyapa samhita swedana is classified as a, Hasta, Pradeha, Nadi, Prastara, Sankara, Upanaha, and Avagaha.

Harita Samhita: [72]

In Harita samhita swedana is classified as a Loshta, Bhashpa, Agnijwala, Ghatisweda, Jala, Pala, Valuka sweda.

Bhela Samhita: [73]

In Bhela samhita swedana is classified as a Sankara, Prastara, Nadi, Parisheka, Droni, Jala, Udakoshta, and Kuti.

Vangasena: [74]

In Vangasena samhita swedana is classified as a Mamsa, Mashatiladi, Valuka, Kumbhi, Pindi, Ishtika, Prastara, Sankara.

Sharangadhara:

In Sharangadhara samhita swedana is classified as a

Saagni sweda: [75] Taapa – Ushma – Drava - Upanaaha Sweda.

Niragni sweda: [76] Niyuddha – Margagamana – Gurupravarana – Kshudha – Chinta – Vyayama – Bhaara.

Bhavamishra: [77]

In bhavaprakasha swedana is classified as a

Saagni sweda: Taapa – Ushma – Drava - Upanaaha Sweda.

According to the dosha:

The applicability of the swedana is also determined on the doshic predominance.

Vata Dominant Disease – Upanaha sweda

Pitta Dominant Disease – Drava sweda

Kapha Dominant Disease – Taapa & Ushma sweda[78]

According to the sthana:

Amashayagata vata - Rukshapoorva sneha sweda

Pakwshaya gata vata – Snehapoorva Ruksha Sweda[79,80]

According to Vyadhi bala and Rogi bala: [81]

Mahan sweda – Mahavyadhi and Mahabala Rogi

Madhyama sweda – Madhyama vyadhi and Madhyamabala Rogi

Mrudu sweda – Durbala Vyadhi and Alpabala Rogi

According to kaala: [82]

Sheeta kaala: Mahan sweda

Ushna kaala: Mrudu sweda

Acording to Age: [83]

New Born Baby to 4 months old baby – Hasta sweda

According to Site: [84]

Mrudu sweda: Hridaya – chakshu – Vrshana pradesha

Madhyama sweda: Vankshana pradesha

Indications of Swedana :

Table No: 01

Lakshana	**C.S[85]**	**S.S[86]**	**A.S[87]**	**A.H[88]**	**K.S[89]**	**H.S[90]**	**B.S[91]**
Pratisyaya	+	-	+	+	+	-	-
Kasa	+	-	+	+	+	-	-
Hikka	+	-	+	+	-	-	-
Shvasa	+	-	+	+	+	-	-
Anga Gourava	+	-	+	+	+	-	-
Karna Shula	+	-	+	+	+	-	-
Manya Shula	+	-	+	+	+	-	-
Sira Shula	+	-	+	+	+	-	-
Swara Bheda	+	-	+	+	+	-	-
Gala Graha	+	-	-	-	+	-	-
Pakshaghatha	+	-	+	-	+	-	+
Vinamaka	+	-	-	+	-	-	-
Kosta Anaha	+	-	-	-	+	-	-
Vibandha	+	-	+	+	+	-	-
Shukraghata	+	-	+	+	+	-	-
Visesha Jrumbha	+	-	-	+	-	-	-
Parshva Graha	+	-	+	+	+	-	-
Pristha Graha	+	-	+	+	+	-	-
Kati Graha	+	-	+	+	+	-	-
Kukshi Graha	+	-	+	+	+	-	-
Mutra Krichra	+	-	+	+	+	-	-
Muska Roga	+	-	+	+	+	-	-
Angamarda	+	-	++	+	+	-	-
Pada Pida	+	-	-	+	-	-	-
Uru Pida	+	-	-	+	-	-	-
Shotha Roga	+	-	-	+	-	-	-
Khalli Roga	+	-	+	+	+	-	-
Ama Dosha	+	-	+	+	+	-	-

SheetaJanyaRog	+	-	+	+	+	-	-
Kampavata	+	-	+	+	+	-	-
Vatakantaka	+	-	+	+	+	-	-
Antarayama	+	-	+	+	+	-	+
Bahirayama	+	-	+	+	+	-	+
Anga Sthambha	+	-	+	+	-	-	-
Vata Vyadhi	-	-	+	+	-	+	+
Shleshma Roga	-	-	-	+	-	+	-
Adya Vata	-	-	+	+	-	-	-
Hanu Graha	-	-	+	+	+	-	+
Ekanga Vata	+	-	-	+	-	-	-
Sarvanga Vata	+	-	-	-	-	-	-
Gridhrasi	+	-	-	-	-	-	-
Janu Pida	+	-	-	-	-	-	-
Anga Sankocha	+	-	-	-	-	-	-
Shoola	-	-	+	-	+	+	-
Apatanaka	-	-	+	-	-	-	-
Adhmana	-	-	+	+	-	-	-
Shiro Graha	-	-	-	-	+	-	-
Yakshma	-	-	-	-	+	-	-
Shalyapahata	-	+	-	-	-	-	-
Arsha	-	+	-	-	-	-	-
Ashmari	-	+	-	-	-	-	-
Bhagandhara	-	+	-	-	-	-	-
Shotha	-	+	-	-	-	+	-

Contraindications of Swedana:

Table No: 02

Lakshana	**C S[92]**	**S S[93]**	**A S[94]**	**A H[95]**	**K S[96]**	**B S[97]**	**H S[98]**
Madhyapa	+	+	+	+	+	-	-
Garbhini stri	+	+	+	+	+	+	-
Raktapitta	+	+	-	-	-	-	-
Atisara	+	+	-	-	-	-	+
Ruksha vyakti	+	-	+	-	-	-	-
Madhumehi	+	+	-	+	-	-	-
Dagdha	+	-	+	+	+	-	-
Gudabhramsa	+	-	+	+	+	-	-
Gudavrana	+	-	+	+	-	-	-
Visha Vikara	+	+	+	+	+	-	+
Murcha	+	-	-	+	-	-	+
Sthoulya	+	+	+	+	-	-	-
Pittaj Prameha	+	-	+	-	+	-	-
Trushitha	+	+	+	+	+	+	-
Kruddha	+	-	+	+	+	-	-
Chinthagrastha	+	-	+	+	+	-	-
Kamala	+	-	+	+	-	-	-
Udara Roga	+	+	+	+	-	-	-
Kshata	+	-	+	+	-	-	-
Vatarakta	+	-	+	-	-	-	-
Durbala	+	+	-	+	+	-	-
Timira Roga	+	-	+	+	+	-	-
Madhyaj Roga	+	-	-	-	-	-	-
Aanta Rogi	+	-	-	-	-	-	-
Kshuditha	+	-	-	+	-	-	-
Vishuska	+	-	-	_	-	-	-
Oja Kshaya	+	-	-	_	-	-	-
Pandu Roga	-	+	-	_	-	-	-

Kshaya Roga	-	+	-	_	-	-	-
Chardi Roga	-	+	-	_	-	-	-
AthyayikaRoga	-	-	+	+	-	-	-
Prasutha	-	-	+	+	-	-	-
Rajaswala	-	-	+	+	-	-	-
Pittaja Roga	-	-	+	+	-	-	-
Pandu	-	-	+	+	-	-	-
Bhaya Grastha	-	-	+	+	-	-	-
Shoka Grastha	-	-	+	+	-	-	-
Ajirna	-	+	-	+	+	-	-
Kusta	-	-	+	+	-	-	-
Dugdha Peeta	-	-	+	+	-	-	-
Dadhi Pita	-	-	+	+	-	-	-
Sneha Pita	-	-	+	+	-	-	-
Virechita	-	-	+	+	+	-	-
Asthibhagna	-	-	-	+	+	-	-
Tivra Jvara	-	-	-	+	-	-	+
Daha	-	-	-	+	-	-	+
Shosha	-	-	-	-	-	-	+
Bhrama	-	-	-	+	-	-	+
Prameha	+	+	+	+	-	-	+
Kshina	+	+	+	+	+	-	+
Pandu	+	+	-	+	+	-	-

Qualities of Swedana Dravyas:

Table No: 03

Guna	**C S** [99]	**A S** [100]	**A H** [101]
Ushna	+	+	+
Tikshna	+	+	+
Sara	+	+	+
Snigdha	+	+	+
Ruksha	+	+	+
Sukshma	+	+	+
Drava	+	+	+
Sthira	+	+	+
Guru	+	+	+

Here, we can find the qualities like Snigdha – ruksha, Sara – Sthira which are contradictory qualities & are present in swedana drugs. By this we may understand that, these qualities mentioned by different acharyas, are need not to be present in all the drugs instead they may be present in single dravya or the procedure.

e.g: Snigdha: snigdha Patrapinda Sweda along with taila

Ruksha: Valuka sweda

Drava: Parisheka

Sthira: Upanaha.

Samyak Swinna Lakshana :

शीतषुलव्युपरमे स्तम्भगौरवनिग्रहै ।

संजातेमार्दवे स्वेदे स्वेदनाव्दिरतिर्मता ॥ च. सु. च. द. भा. प्र.

स्वेदस्त्रावो व्याधिहानिर्लघुत्व शीताथित्व मार्दव चातुरस्य ।

सम्यकस्विन्ने लक्षण प्राहूरेतत..... ॥ सु चि ३२/२३

शीतषुलक्षये स्विन्नो जाते अगांनाच मार्दवे ॥ अ. स. सु. २६/२२ अ. र. सु. १७/१४

Table No: 04

Lakshana	CS [102]	SS[103]	AS [104]	A H[105]	K S[106]	BS[107]	B P[108]	CD[109]
Sheeta Vyuparama	+	-	+	+	-	+	+	+
Shoola Vyuparama	+	-	+	+	-	-	+	+
Sthambha Nigraha	+	-	-	-	-	-	+	+
Gaurava Nigraha	+	+	-	-	-	-	+	+
Tvak Mardavata	+	+	-	-	-	-	+	+
Sweda Srava	+	+	+	+	-	+	+	+
Vyadhi Hani	-	+	-	-	-	-	-	-
Shitartitatwa	-	+	-	-	-	-	-	-
Saukhyam	-	-	-	-	+	-	-	-
Roga Mrudhutha	-	-	-	-	+	-	-	-
Kale visrusti	-	-	-	-	+	-	-	-
Kale Kshuth	-	-	-	-	+	-	-	-
Kale Trushna	-	-	-	-	+	-	-	-
Sparsha Saukhyam	-	-	-	-	-	+	-	-
Avaivarnya	-	-	-	-	-	+	-	-

Atiswinna Lakshana:

Table No: 05

Lakshana	CS [110]	SS [111]	AS [112]	AH [113]	K S[114]	BS [115]	B P[116]	C D[117]
Pitta Prakopa	+	+	+	+	+	+	+	+
Murcha	+	+	+	+	+	+	-	+
Sharira Sadana	+	-	+	+	-	-	-	-
Trusha	+	+	+	+	+	+	+	+
Daha	+	+	-	-	+	+	+	+
Svara Daurbalya	+	-	+	+	-	-	-	-
Anga Daurbalya	+	-	+	+	-	-	-	-
Sandhi pida	-	+	+	+	-	-	+	+
Sphota	-	+	-	-	-	-	-	+
Rakta Prakopa	-	+	+	+	+	-	+	+
Bhranti	-	+	+	+	+	-	+	-
Klama	-	+	-	-	-	-	+	+

Aswinna / Manda swinna Lakshana

Table No: 06

Lakshana	S S[118]	K S[119]	B S[120]	Sh.Sa[121]
Vyadhi Vruddhi	+	-	-	-
Gurutvam	+	+	+	+
Usnabhilasha	+	-	-	-
Deha Katinya	+	-	-	-
Vatasya apragunyathvam	-	+	+	+
Sthabdha Gatrata	-	+	+	+
Glani	-	+	-	-

Treatment:

For Atiswinna: [122] Madhura – Snigdha – Sheetala Upachara

For Mandaswinna: After considering Vyadhibala – vaya – dosha and rutu, Swedana has to be repeated.

PINDA SWEDA

Etymology of Pinda:

संहते - Struk together , Closely joined / United with.[123]

गोल: - a ball , a circle , a sphere.[124]

वर्तुलाकृति: [125]

To roll into lump / ball – Put together

Join, Unite

Any round / a ball

Any rounded mass [126]

Definition:

Pindasweda is a procedure which is performed with the help of pinda**.**

पिण्डरूपस्वेद: पिण्डस्वेद: |[127] उपनाहद्रव्य उत्कारिका: पूर्वोक्ता: मांसवेशवारादि कृता इति पिण्डस्वेद: ।

पिण्दस्वेद: प्रथमस्तथैव च पिण्डस्वेदस्य सङ्कर इत्याख्या ॥[१२८]

गवादि शकृतेन आर्द्रेण पिण्डीकृतेन उष्णेन स च पिण्डस्वेदं स एव सङ्करस्वेद उच्यते ।[१२९]

पिण्डस्वेद: कृशर पायसादिभि: ।[१३०]

पयसा अपि वा इति घनीभूतक्षीरपिण्डेन इत्यर्थ: ।[१३१]

तत्र वस्त्रान्तरितै: अवस्त्रान्तरितै: वा पिण्डै: यथोक्तै: उपस्वेदनं सङ्करस्वेद इति विद्यात् ॥[१३२]

Pindasweda drugs

Table number: 07

Dravya	**C S[133]**	**S S[134]**	**A S[135]**	**A H[136]**
Patrabhanga	-	-	-	+
Masha	+	-	-	-
Kulatha	+	-	-	-
Amla dravya	+	-	+	-
Ghrita	+	-	-	-
Taila	+	-	-	-
Odana	+	-	-	-
Payasa	+	+	+	-
Krushra	+	+	+	-
Mamsa	+	+	-	-
Go Shakruta	+	-	-	-
Khara Shakruta	+	-	-	-
Ushtra Shakruta	+	-	-	-
Varaha Shakruta	+	-	-	-
Ashwa Shakruta	+	-	-	-
Satush	+	-	-	+
Sikata	+	-	+	-
Panshu	+	-	+	+
Pashana	+	-	+	+
Karisha	+	-	-	+
Ayasa putakai	+	-	-	-
Kakolyadi Gana	-	+	-	-
Eladi Gana	-	+	-	-
SurasadiGana	-	+	-	-
Atasi	-	+	-	-
Utkarika	-	+	-	-
Veshvara	-	+	-	+
Kapal	-	-	+	+
Lohapinda	-	-	+	-

On the basis of Dravya Yoni grouping of different pindasweda drugs

Table No: 08

Swedabheda Darvya yoni	**Snigdha Pinda Sweda**	**Ruksha Pinda Sweda**
Sthavar	Tila, Masha, Kulatha, Amla dravya, Taila, Odana, Payasa, Krushra, Atasi, Kakolyadi gana, eladi gana, surasadi gana, utkarika, Patrabhanga**.**	Satusha, Yava
Jangam	Grita, Mamsa	Go, Khara, Ushtra, Varaha, Ashwa shakruta, Karish

Applicability of pindasweda in different diseases

Table No: 09

DISEASES	**C S[137]**	**S S[138]**	**AS[139]**	**A H[140]**
Kushtha	+	-	+	-
Rajayakshma	+	-	-	-
Arsha	+	-	+	+
Bhagandar	-	-	+	+
Vataj Shoola	-	+	-	-
Vataj Mutrakrucha	-	-	+	+
Akshipaka (netra Roga)	-	-	+	-
Pilla (netra Roga)	-	-	+	-
Karna Roga	-	+	+	+
Shiro Roga	-	-	+	+
Kaphaj Shiroabhitapa	-	-	+	-
Pinasa	-	-	-	+

Procedure of Swedana:

The procedure of patra pindasweda and nadisweda can be explained under three heading:

1.Poorvakarma

2. Pradhanakarma

3. Paschat karma

1. Poorvakarma

a) Sambhara Sangraha:

- Necessary equipments required for the procedure should be collected.
- Collection of the drugs needed for the swedana.
- Preparation of the pinda.
- Collection of the drugs for treating the atiyoga & ayoga complications.

b)Atura Pariksha

- Parameters like desha, rutu, rogabala, vaya should be assessed.

c) Atura poorvakarma: Sthanika abhyanga with tila taila.

Requirements

Table No: 10

S.No	**Requirements**	
1	Droni / chair	
2	Vessel having round bottom-2	For frying the drugs & for heating the pinda
3	Darvi-1, Plate-1	For frying
4	Gas cylinder,Stove	For frying & heating
5	Knife/chisel -1	To chopp the leaves
6	Cotton / kora cloth – 2	For making the pinda
7	Threads – 2	For tying the pinda
8	Pindasweda dravyas	For Swedana procedure
9	Moorchita tila taila	200ml/patient for sthanika abhyanga

Preparation of the Pinda:

- **Patra Pinda Sweda :**[141]

The nirgundi patra are cut into small pieces and is then taken in a vessel of round bottom. The oil is added to this. With continuos stirring the leaves are then fried to make it plaint. This fried leaves is used for the preparation of packs. The cotton cloth is spread on the working table. About 250 grams of fried leaves are placed on the cloth and pottali is prepared.

Tying the Pinda:

The free corners of the cloth are approximated to cover the leaves.The free ends of the cloths are folded in its middle and then is tied with a cotton thread (85-90 cms length) to make a rounded bolus with handle.In this way 2 bolus / Pinda is prepared.

Heating the Prepared Pinda: [142]

Little quantity of tilaataila is taken in a vessel and is heated. Then the prepared two pinda /bolus are placed in the vessel & continuously moved stirring the oil. (If the bolus is not moved,there is every possibility that the portion of the bolus gets burnt).When the bolus/Pinda is properly heated it is takenout of the vessel,any oil flowing from the pack is mopped to the edge of the vessel.This Pinda is used for the Swedana Procedure.

Aatura Poorvakarma:

Preparation of the Patient:

This is the unique procedure for applying swedana or heat to a portion of the body, hence depending upon the comfort of the patient Swedana may be performed in the sitting position or lyingdown position.In this study as back is involved, hence this procedure can be best performed in the lying down position of the patient with the head rested upon a pillow & the hands placed on the side of the body.

Sthanika Abhyanga:

The tila taila is applied over back and mrudu abhyanga is performed.[143]

Pradhanakarma:

Swedaavacharana:

Heat is applied to the joints by this bolus / Pinda. To begin with, one should confirm the heat in the bolus by touching the bolus on the dorsum of the hand. Then heat is applied on the part to be treated or fomented.The bolus may be momentarily touched on the joints or it may be moved on the joints or even it may be placed over or beneath the joint.

Heat is applied initially by momentarily touching the body. This method is continued till the heat in the bolus is lost considerably. When the heat is reduced considerably & is moderate, then one has to move the bolus over the affected part in linear fashion on the extrimities from above downwards & in joints circular fashoin.By this heat will further reduces. Then, one has to place the bolus on the above & beneath the affected part.Then procedure is continued by taking another bolus which is kept in the vessel for heating in similar manner.[144]

Nireekshana:

- For the indicative of proper effect of Swedana
- If the patient develops any symptoms indicative of Aswinn or Atiswinna should be treated accordingly.

Paschat karma:

Patient is asked to take rest for few minutes & then the part treated with swedana is washed with warm water.[145]

सम्यक् स्विन्नं विमृदितं स्नातं उष्णाम्बुभिः शनैः ।

स्वभ्यक्त प्रावृताङ्ग च निवातशरणस्थितम् ॥

भोजयेत् अनभिष्यन्दि सर्वं च आचारमादिशेत् । [१४६]

स्निग्धः स्वेदैः उपक्रम्य स्विन्नः पथ्याशनो भवेत ।

तदहः स्विन्नगात्रस्तु व्यायामं वर्जयेन्नरः ॥ [१४७]

स्विद्यमानस्यच मृदुः हृदयं शीतलैः स्पृशेत् । [१४८]

NADI SWEDA

Etymology of Nadi:

Nadi: means nalam i.e. tube like structure.[149]

Definition:

Nadisweda is a procedure where perspiration is induced by passing steam over the body parts by using a nadi swedana yantra.[150]

The swedana drugs are boiled in a small vessel which does not emit vapour. This vapour is carried out to the patients' body part through a pipe made up of reed, bomboo leaves or the leaves of karanja and arka, bent at two or three places and well covered on holes with the leaves of vata alleviating plants. The pipe should be like the forepart of the trunk of an elephant , having vyama(91.44cm) or ardhavyama(45.72cm) or ¼ vyama(22.86 cm) length, The circumference in proximal is one vyama and 1/8 vyama in distal end. Vapour travelling through zigzag course loses its intensity of impulse and as such provides fomentation comfortably without producing burning effects on skin.[151]

स्वेदनद्रव्याणां पुनर्मुलफला बाष्पो हयनृजुगामी ।

विहतचण्डवेगस्त्वचमविदहन सुख स्वेदयतिती नाडीस्वेद॥ च. सु. १४/४३

प्रच्छन्नपात्रस्य तु ता नाडीमुध्दाटयेदभिषक्त ।

नाडीस्वेद : समाख्यात : यावत्प्रस्वेदनादिति ॥ भे. सु. २२/२०–२२

Nadi swedana instrument: The instrument used for nadi sweda consists of a vessel, rubber tube and a nozzle.About the vessel; it is a five liter capacity vessel with a wide mouth. The mouth is fitted with an air tight lid. In its summit the lid has a nozzle with a lumen of approximately 2mm. The 5 feet long rubber tubing tightly fits into this nozzle. The steam generated out of decoction, reaches the lid, tubing and then escapes through nozzle.[152]

Nadisweda drugs

Table number: 11

Dravya	**C S[153]**
Gramya mamsa	+
Aanupa mamsa	+
Udaka mamsa	+
Paya	+
Bastashira	+
Varahamadhya pitta asruka	+
Tilatandula	+
Varuna	+
Amruta	+
Eranda	+
Shigrumula	+
Sarshapa	+
Vasa	+
Vansha	+
Karanja	+
Arka	+
Ashmantaka	+
Shobhanjana	+
Sairaiya	+
Malati	+
Tulasi	+
Arjaka	+
Bhutika	+
Panchamula	+
Sura	+
Dadhi	+
Mastu	+
Mutra	+
Amla	+

On the basis of Dravya Yoni grouping of different nadisweda drugs

Table No: 12

Swedabheda **Dravya yoni**	Dravya
Sthavar	Tilatandula, Varuna, Amruta, Eranda, Shigrumula, Sarshapa, Vansha, Karanja, Arka Ashmantaka, Shobhanjana, Sairaiya, Malati, Tulasi, Arjaka, Amla, Bhutika, Panchamula, Sura
Jangam	Gramya mamsa, Aanupa mamsa, Udaka mamsa, Paya, Bastashira, Varahamadhya pitta asruka, Vasa, Dadhi, Mastu, Mutra,

Applicability of Nadisweda in different diseases

Table No: 13

DISEASES	**C S[154]**	**A H[155]**
Kushtha	+	-----
Rajayakshma	+	---
Hikka shwasa	+	+
Vatavyadhi	+	+
Aardita	+	---
Yonivyapada	+	-----

Procedure of Swedana:

The procedure of Nadisweda can be explained under three heading:

1.Poorvakarma

2. Pradhanakarma

3. Paschat karma

1. Poorvakarma

a) Sambhara Sangraha:

- Necessary equipments required for the procedure should be collected.
- Collection of the drugs needed for the swedana.
- Preparation of the decoction for nadi sweda.
- Collectipn of the drugs for treating the atiyoga & ayoga complications.

b)Atura Pariksha

- Parameters like desha, rutu, rogabala, vaya should be assessed.

c)Atura poorvakarma : Sthanika Abhyanga with tila taila.

Requirements

Table No: 14

S.No	Requirements	
1	Droni / chair	For to sit or lie down a patient
2	Vessel having round bottom	To prepare decoction
3	Darvi-1, Plate-1	For stirring
4	Gas cylinder,Stove	For heating
5	Nadi swedana instrument	To perform a swedana
6	Nadisweda dravyas	For swedana procedure
7	tila taila	sthanika abhyanga

Preparation of the decoction:

To perform a nadi swedan a decoction is to be prepared out of the swedana drugs. Then pour the decoction in a nadi swedana yantra. The decoction in the nadi sweda yantra is boiled to generate the steam.

Aatura Poorvakarma:

Preparation of the Patient:

This is the unique procedure for applying Swedana, hence depending upon the comfort of the patient Swedana may be performed in the sitting position or lyingdown position. In this study as back is involved,hence this procedure can be best performed in the sitting position of the patient.

Sthanika Abhyanga:

The tila taila is applied over back and mrudu abhyanga is performed.

Pradhanakarma: [156]

Swedaavacharana:

The decoction in the nadi sweda yantra is boiled to generate the steam. The steam is made to fall on the body part to be subjected to swedana.From a convenient distance. Considerable distance between the nozzle and body part is maintained so as to prevent overheating as well as to prevent any drop of hot water collected in the nozzle falling on the patient's body.

Passing the steam is continued till getting the samyaka swinna laxanas.

Nireekshana:

- For the indicative of proper effect of swedana
- If the patient develops any symptoms indicative of aswinna or atiswinna should be treated accordingly.

Paschat karma:

Patient is asked to take rest for few minutes & then the part treated with Swedana is washed with warm water.

2.2 Disease Review

Introduction: The review of disease is important to understand the origin and journey of the particular disease in human being. Therefore an effort has been made to collect the references about katishoola.

In charaka samhita though katishoola has been not enlisted in the 80 nanatmaja vatavyadhi, but in case of anukta vatavikara charaka stated that the vitiated vata reaches to which region, organ causes diseases such as shoola, shosha, supti, sankocha, stambha. These all should be consider as vatavikar.

Likewise charaka samhita in other samhita like sushruta samhita, ashtang hridaya we come across the term katishool. Bhela samhita and Kashyapa samhita has given a status of individual disease to katishool. Later on treatises like chakradatta, yogaratnakar, sharangdhara, elaborated the many preparations which have been exclusively indicated for katishool. Nighantu ratnakar has given separate karmavipak for katishool which justifies it as a separate disease entity.

Vedic period:

Vedas are the prime source of knowledge.The words anukam; anukyam has been used at many places to denote a back. The word prishta has been elaborated in many places in Rigveda[1] and Yajurveda[2].

In Atharvaveda the vata is prayed for, do not leave the body but bear the limbs till the old age.[3]In Atharvaveda there is a prayer stating that keep an ojus in uru spread in prushta and jaghana which is having the capacity to straight and erect the foot and responsible for unimpaired organs of the entire body.[4]

पादोभ्यां ते जानुभ्यां श्रोणिभ्यां परि भसेसः।

अनेकादवर्शणीरूण्णिहाभ्यःषीर्शो रोगमनीनषम।

संतै षीर्शणःकपालेनि हृदेयस्य च यो विधुः॥ अथर्ववेद कांड ९ सुक्त ८ श्लोक २१,२२

Another hyms describes that keep the thigh and prushta of the body healthy for 100 years.[5] There is another one quotation from Atharvaveda which quotes that, I have removed the disease reached to the spine through your legs, knee, pelvis from your ushnila nadi.[6]

The disease yakshma has been described in detail in vedas, in which there is description of involvement of body parts as uru, shroni, prishta, asthi, and majja.[7, 8, 9.]

Upanishad and purana:

Kanthopnishad elaborated the word sushumna and describes that it comes out by piercing the skull.[10]

Kenopnishad describes as the vayu is one which is always in motion. [11]

Prashnopnishad describes that among the multiple nadis the sushumna is one through which the udan vayu moves to and fro from head to foot [12].

Health topics have been described in detail in garuda purana. The chapter is present as vatavyadhinidana.[13] The causative factor to provoke the vata dosha, [14] their sign symptoms, [15] and the seat of vata is guda and shroni[16] has been described in garuda purana.

SAMHITA:

Charaka samhita:

In charaka samhita though katishoola has been not enlisted in the 80 nanatmaja vatavyadhi, but in case of anukta vatavikara charaka stated that the vitiated vata reaches to which region, organ causes diseases such as shula, shosha, supti, sankocha, stambha. These all should be consider as vatavikar .[17]

सर्वेश्वपी खल्वेतेशु वातविकारेशुक्तेश्वन्येशु च अनुक्तेशु वायोरिदमात्मरूपमपरिणामि

कर्मनष्च वलंक्षणं यदुपलभ्यं तदवयव वा तथा ॥

खरपरूशविषदसुशिरारूण वर्णकशाय विरसमुखत्वसोशषूल सुप्तिसंकोचनस्तंभ नख

जातादीनी च वायोःकर्मणि तैरन्वितं वातविकारमेवा ध्यवस्येत ॥ च. सु. २०/१२

Aacharya Charaka stated that it is not possible to nomenclate all diseases therefore diseases can be nomenclate as per ruja, sthana, sansthana.[18]Kati is one among the vata sthana.[19]

Hence in Charaka samhita though katishula has not been enlisted in the ukta nanatmaja vata vyadhi, by applying the principles of anukta vyadhi katishoola is considered as disease under vatavyadhi by its sthana and ruja.

Apart from this the elaboration of term katishool and it's nearby is present at many places.

Different types of pain at kati in vataj jwara.[20]

Kati sangraha is one of the swedya vyadhi.[21]

Kati and prishta graha is present in vrikkaja vidhradhi.[22]

Kati, prishta and trika shoola is present in vataj arsha.[23]

Kati, uru and trika shoola in vatik atisar.[24]

Katishoola is present in gridhrasi.[25]

Sushruta samhita:

The references regarding katishool are also present in sushruta samhita at many places.

Katishoola is present in vataj arsha.[26]

Katishoola is present as a poorvaroopa in purishaja aanaha[27] vankshanottha vidhradi[28] and bhangadar.[29]

The katishoola is present in bhagna, seventh stage of sarpavisha.[30]

Aacharya sushruta has not included katishoola as a symptom in gridhrasi.[31] In this way he has seperated the katishoola from gridhrasi.

Kashyapasamhita:

Acharya kashyapa has categorised the katishool as one of the disease occurs due to the improper management of labour (dushprajata) [32]

In the khilasthana there is a description of eight types of shoola, their etiology and pathology.[33]

Bhela samhita:

Aacharya Bhela has differentiated a vatavyadhi as sarvang roga and ekang roga. Katishool has been included by him in ekang roga[34]

Aacharya Bhela has narrated that katiprishtagata vata is the main factor in the manifestation of katishoola.[35]

तत्र पादतलागुश्ठ जंघाजानुरूवक्षणै ।

गुदमेढक्टीपृश्टयोनिगभाषयैरपि ।

दुयादिभर्विक्लैष्चापि ज्ञेयास्त्वेक्रांगरोगिणः ॥ भे. सु.२५,३६,३८

Harita samhita:

Harita illustrated the vataj vikara as per five types of vata as 16 diseases for each type.[36]

Harita describes the shoola and has given a status of disease .He has mentioned ten types of shoola.[37]

Ashtanghridaya:

In Ashtang hridaya the elaboration of vata and vataj vikar is present at sutrashtana, nidana sthana and chikitsasthana.[38, 39, 40]

Katitoda and katibheda are mentioned as the poorvaroopa of vatarakta.[41, 42]

Apart from this the katishoola is present as a symptomps in vataj jwara, vataj arsha, vatodar, sahaja arsha, vrikkaja vidhradhi.[43, 44, 45, 46.]

Madhavanidana:

Madhava describes the vatavyadhi more elaborately by incorporating the descriptions of different acharyas.[47]

The shoola has been described by Madhava in detail.[48]

The katishoola has been elaborated in the many contexts as vataj arsha, [49] sangraha grahani[50], vatanubandhi raktarsha, [51] anaha[52]and aamavata. [53]

Chakradatta:

This treatise of chakrapani is composed of many preparations for different diseases. In vatavyadhi chikitsa he has mentioned different preparations for katishoola.[54]

Different words indicating or nearby for katishoola are elaborated such as katiaamaya, katiruja, katigraha.

Bhavaprakasha:

Bhavaprakasha adviced the chaturbeeja in kativyatha[55] ushnapana in shronishoola.[56]

Yogaratnakar:

Yogratnakar has introduced the different terms like katishoola, kati vata, kati pida in vataroga chikitsa.He has adviced the eranda taila, eranda beeja prayoga, adraka rasa for these conditions.[57]

Sharangadhara:

Sharangadhara has mentioned the different medicines for katishoola such as ajamodadi churna for ruja in katipradesh.[58]

Nighantu ratnakar:

Nighantu ratnakar has given the status of individual disease to katishoola by describing the karmavipak of katishoola seperately. He stated that the person who does coitus with cow is get afflicted by katishoola. To get relieve from this he has to perform a kriccha chandrayana, ati kriccha chandrayana and soursukta japa.[59]

Apart from this he has mentioned the administration of dashmoola kashaya with shunthi and eranda tail to subside the katishoola.[60]

Rachana and kriya sharir of kati:

Aacharya sushruta has counted thirty bones and twenty four pratar sandhi in spine.[61]

In sushruta sharirasthana mentioned that shroni is formed by union of five bones.[62]

Aacharya bhela described 45 kasherukas in prishta and 15 in greeva.[63]

Acharya Bhela has described the two types of prishta viz., kshari and pakshari.[64]

The dimension of kati is 18 angula.[65]

तत्र अश्टांदशागुंल विस्तीर्णा कटी ॥

Kati is one among the prime seat of vata dosha.[66]

In Ayurvedic classics sandhis are being classified into two types, sthira and chala.[67]

Furthermore sandhis are classified into eight types. [68]

- Kora
- Udukhala
- Samudga
- Pratara
- Tunnasevani
- Vayastunda
- Mandal
- Shankhavarta

Sushruta samhita considered the sandhi of kati as a chala sandhi and further classified under tunnasevani.[69]

Apart from this the factors which are responsible for joint formation and proper function are,

Shleshmadhara Kala: This is fourth kala which is present in all the joints. This help in the lubrication of joint.[70]

Shleshaka Kapha: This kind of kapha resides in joint. This is helpful to maintain the firmness of joint, helps in articulation and prevent from separation.[71]

Vyana Vata: This vata resides in hridaya and controls the movement of whole body. The gati, utkshepana, aakshepana is all because of vyana vata.[72]

Gayadas while commenting on sushruta samhita has elaborated the reference from unknown author as the residence of vyana vata is in sandhi and its function is all over body.[73]

Snayu: Among the 900 snayus the 60 are present in kati pradesha.[74]

Peshi: [75]

Sanghata: [76]

Katishoola a disease:

Vyutpatti: The word katishool is made up of two words viz., Kati and Shool.

The word kati is derived from the dhatu "kat + in"and is considered as bodily part where the dress is tightened.[77]

The term shool is indicative of pain shool rugayam[78] शूल रूगायाम □

Paryaya: The paryayas of kati are shroni, kukudmati.[79]

Definition: The presence of pain at the kati region (low back) is called as katishool.

By all these reviews we come to know that katishool is present since historical period.

In the present era the prevalence and incidence of katishoola i.e. low back pain is higher.

Low back pain:

Backache which was known as an ancient curse is now known as a modern international epidemic.[80] Nobody is immune to neither this condition nor its potential disability which is not discriminate by gender, age, race, or culture.[81] Low backache refers to pain from the low lumbar region, lumbo sacral region and both SI joint.[82]

Sign and symptoms: Back pain is usually felt in the lumbar area, spinal stiffness difficulty in the daily activities are presenting symptoms.[83]

Epidemiology:

Backache is known as a modern international epidemic.[84] There are number of surveys in multiple countries that reveals a point prevalence of 17-30 percent , a one month prevalence of 19-43 percent and a lifetime prevalence of 60-80 percent. An annual incidence of 5 percent. [85]

At the age of 40 years the prevalence is slightly higher in women and after the age of 50 it is slightly higher in men.[86]Approximately one percent population is permanently disabled by backpain, whereas 1-2 percent temporarily disabled from their normal occupation.[87]

Children and adolescents are not immune from back pain. Surveys reveal that approximately 5 percent of all children have a history of back pain that interferes with activity, with 27 percent reporting back pain at some time.[88]

Work that requires minimal physically strenuous activity, such as the finance, insurance and service industries, has the lowest back injury rates, whereas work requiring repetitive and strenuous activity such as construction, mining and forestry has the highest injury rates.[89]

Importance of back pain:

Low back pain is a miserable condition which creates obstacle in living of person. Low back pain is the most common cause contributing to a large number of lost work days and disability claim.

The importance of back pain in world is underscored by the following:

♦ The annual social cost of back pain in the United States is estimated to be between $20 and $50 billion.

♦ Back symptoms are the most common cause of disability in patients under 45 years of age.

♦ 50% of working adults, in one survey, admitted to having a back injury each year and

♦ Approximately 1% of the U.S. population is chronically disabled because of back pain.[90]

According to a survey, low back pain is extraordinarily common, and second only to the common cold .[91]

Importance of study:

The back pain has become one of the leading cause of disability in our society and cost of the treatment has been increasing progressively each year without any obvious effect on the frequency and severity of condition.[92]

There is enormous economic pressure to provide rational and efficient care of patient with back pain.[93]

Despite the staggering annual costs of back pain to society there is paucity of well controlled clinical trials in this area .[94]

In one study it has been quoted that 40% of back surgeries fail and even in successful surgeries, pain and subsequent disability have returned after a variable period of 6 months to 20 year.[95]

Anatomy of low back: [96, 97, 98]

It is important to understand the normal anatomical structure before analyzing the pathological changes.

The anatomical structure of low back includes,

Lumbar vertebrae

Joints: Intervertebral joints

Zygophyseal / Apophyseal / Facet joint

Lumbosacral joint

Sacroiliac joint.

Disc

Ligaments:

Anterior longitudinal ligament

Posterior longitudinal ligament

Ligamentum flavum

Supraspinatum ligament

Inter spinous ligament

Inter transverse ligament

Ilio lumbar ligament

Muscles:

Psoas major

Quadrates lumborum

Intertransversarii laterales

Intertransversarii Mediales

Interspinates

Multifidus

Nerve Supply: anterior and posterior longitudinal (sinu vertebral nerves) plexuses.

Blood supply: Lumbar arteries

Lumbar Vertebrae:

There are five lumbar vertebrae. The first four are typical and the fifth is atypical lumbar vertebrae is identified by its large size and absence of costal facets on the body.

Typical Lumbar Vertebrae:

The body is large and is wider from side to side than from before backwards.The height of the body is slightly greater anteriorly than posteriorly this difference contribute to the forward convexity of the lumbar spine. The vertebral foramen is triangular in shape and is larger than thoracic but smaller than cervical region.

Each lumbar vertebra is divided in to three sets of functional elements.

Anterior element - consisting vertebral body

The middle elements - consisting of pedicles

Posterior elements – consisting of laminae, articular process, spinous process, accessory process, transverse process, mamillary process.

Anterior element:

These are the essential components of vertebral column endowing it with bulk and height. They sustain compression loads applied to the vertebral column, including not only body weight, but also the compression loads imparted by contraction of back muscles.

Middle element:

They are the only connection between the posterior and anterior elements. It transfers the controlling forces in the posterior to anterior elements.

Posterior element:

Regulates the passive and active forces applied to the vertebral column and thereby control its movements.

Articular process provides a locking mechanism that resists forward sliding, and twisting of the vertebral bodies. The spinous processes, transverse processes, mamillary processes, and accessory processes provides areas for muscle attachments and constitute lever that enhances the action of the attached muscles.

The lamina transmits the forces from spinous process and the inferior articular processes to the pedicles. Thus they are susceptible to injuries such as pars intra articular fractures.

Joints: When any two lumbar vertebrae are articulated they form a three joint complex.motion segment. An intra vertebral disc forms the principle between two vertebral bodies. The other 2 joints are formed by the articulation of superior articular processes of the vertebra and inferior articular process of the vertebra above. These are known as zygophyseal/ Apophyseal/ Facet joints.

Intravetebral disc: Each intra vertebral disc consists of three components. i) Central gelatinous nucleus pulposus ii) Surrounding annulus fibrosis iii) Pair of vertebral end plates

i) Central gelatinous nucleus pulposus: Nucleus consists of a matrix of proteoglycans that bind considerable amount water.

ii) Surrounding annulus fibrosis: It consists concentric laminae of collagen fibers. In each laminae the fibers are parallel and oriented 65 degree from the vertical, but the direction of inclination alternates in successive laminae. The inner fibers of the annular fibrosus envelop the nucleus pulposus and are attached to the margins of the vertebral end plates. The outer fibers are attached to the margins of the vertebral bodies and constitute the ligamentous portion of the annulus fibrosus.

iii) Vertebral end plates: These are the cartilaginous substance which covers the superior and inferior surface of each vertebral body within the area encircled by the ring apophysis. The two end plates of each disc cover the nucleus pulposus as well as the inner 2/3rd of the annular fibrosus. The foremost function of disc is to separate the vertebral bodies so that movements may occur between the vertebral bodies. The disc must be sufficiently compliant to allow movement but sufficiently strong to with stand compression. Compression between vertebral bodies is fundamentally resisted passively by the sheer bulk of the annulus fibrosus. The role of nucleus pulposus is to brace the annulus pulposus and thereby braced it is able to with stand the compression loads, and an impairment of nucleus function compromises the ability of annulus to withstand compression loads causing it to fail by buckling.

Zygophyseal joints: These are the typical synovial joints endowed with cartilage, capsule and synovial membrane. The articular facets exhibit variations in both the shape of their articular surface and general direction in which they face. Such variations determine the extent to which joints can prevent forward sheer translations between vertebral bodies and axial rotations of the inter-body joint. These movements are resulted by the impaction of interior articular process of the vertebra below. The only movement permitted by the lumbar zygophyseal joints sliding movement in a vertical direction, which is executed during flexion and extension of the vertebral column.

Ligaments: The role of ligaments of the lumbar spine has been over emphasized. In effect, no ligaments can stabilize the lumbar spine. Major ligaments are:

1) Anterior longitudinal ligament
2) Posterior longitudinal ligament
3) Ligamentum flavum

4) Supraspinatum ligament

5) Inter spinous ligament

6) Inter transverse ligament

7) Ilio lumbar ligament

1) Anterior longitudinal ligament: These are broad, strong fibrous band attached to the anterior surface of all vertebrae. It decreases in width at the level of disc. It consists of tendons from crus of diaphragm.

2) Posterior longitudinal ligament: It runs posterior to the body of vertebrae separating it from dural sac. It is loosely attached and has inter- woven connection with disc. It has only a nominal role in resisting separation of posterior ends of vertebral bodies during flexion.

3) Ligamentum flavum: It connects laminae and extends laterally to the articular facet. It is thickest in lumbar region. It assists in restoring the column to correct attitude after flexion position and may protect disc from injury.

4) Supraspinatum ligament: It joins the tips of the spinous processes of the vertebrae with aid of intra spinous ligament.

5) Inter spinous ligament: It connects the adjoining spinous processes from their tips to roots.

6) Inter transverse ligament: These are essentially membranes that extend between adjacent transverse processes. They constitute part of facial system that separates the muscles of the ventral compartment from the posterior compartment.

7) Ilio lumbar ligament: It binds Transverse process of L5 to the Ileum. It resists forward sliding, lateral bending and axial rotation of L5 on sacrum.

Muscles: Muscles directly control the movement of vertebral column. In relaxed standing posture almost all muscles are relaxed except slight activity in psoas and abdominus.

a. The psoas major: It arises from the antero-lateral aspect of the lumbar spine and inserts into the lesser trochanter of the femur. It is a flexor of the hip. Its fibers run too close to lumbar spine to exert significant lumbar movement of lumbar vertebra. Therefore it cannot flex the lumbar spine. However, upon contraction as in the exercise of the sit-ups the psoas exerts immense pressure on the vertebral disc.

b. Quadratus lumborum; It is wide rectangular muscle that consist a complex aggregation of various oblique and longitudinally running fibers that connects the lumbar transverse process; the ileum and the 12th rib. Its main action is fixation of

12th rib during respiration. It has a weak action to flex the lumbar spine laterally. While bending forward first 60 degree of movement occurs at lumbar spine and followed by additional movement, 25 degree at hips and pelvis. Glutei and hamstrings lock the initial flexion of the pelvis. At the end of flexion, all spinal muscles are relaxed and the humans are at maximum strain at the movement. Extension of the back with loads shows increased activity in back muscles.

c.Intertransversarii Laterales- Connects consecutive transverse process and are presumed to act synergistically with Quadratus lumborum in lateral flexion of Lumbar spine.

Lumbar back muscles – Lie behind and cover the posterior elements of Lumbar vertebrae.

a) Inter transversarii mediales – small muscles that connect the accessory process and mamillary process of one vertebra to other. They serve as large proprioceptor transducers.

b) Interspinales – Short muscles that connect the spinous process of adjacent lumbar vertebrae. They also probably serve a proprioceptive function.

c. Multifidus The multifidus is para median muscle fascicles that stem from each of the lumbar spinous process and radiate to caudal insertion on mamillary process and the ileum and the sacrum. The main action of this muscle is to extend the lumbar spine or control its flexion, but it also opposes the flexion effect of the abdominal muscles where they contract to produce rotation of the lumbar spine.

Nerve supply:

Vertebral bodies receive the supply from Gray rami communicantes and ventral rami in the form of anterior and posterior longitudinal (sinu vertebral nerves) plexuses. The I.V. Disc innervation is provided by rami communicantes anterolaterally and sinu vertebral nerves posteriorly. The structures posterior to the intervertebral foramen are supplied by branches of dorsal rami.

Blood supply:

From Pairs of Lumbar arteries, the upper four of which arise from the descending aorta, whereas the fifth one arises from median sacral artery.

Vein – the venous drainage of vertebral bodies starts as a subchondral post capillary plexus beneath each vertebral end plate.

Movements of lumbar spine:

The cardinal movements of the lumbar spine are Flexion, Extension, Axial rotation and lateral Flexion. [99,100]

Flexion and Extension

Flexion and Extension involve the combination of sagittal rotation and translation. During flexion of the lumbar spine, each vertebra rotates and translates anteriorly; a reciprocal combination occurs in extension. Translation is resisted primarily by zygapophyseal joints and secondarily by annulus fibrosis of vertebral joints. Rotation is resisted by annulus fibrosis, capsules of zygapophyseal joints, ligaments of IV joints, and most importantly by active or passive tension of back muscles supplemented by passive tension in the thoracolumbar fascia.

Extension is limited primarily by bony impaction.Either the spinous process impact against each other or the inferior articular process impacts against the laminae below.

Axial rotation

Because there are no primary rotators of the lumbar spine, axial rotation is a movement imposed secondarily on the lumbar vertebrae and their joints.

Rotation is achieved by the oblique abdominal muscles acting on the thorax, the movements of which impose a screwing effect on the lumbar spine from L1 to the sacrum.

The motion is resisted by impaction of zygapophyseal joints and by tension developed in the annulus fibrosus; resistance limits the range of rotation at each lumbar segment to <30.

Lateral flexion- Little is known about the lateral flexion of the lumbar spine, which involves a complex and variable combination of lateral bending and rotator movements of the inter body movements and diverse movements of the zygapophyseal joints.

MECHANICAL INJURIES

Flexion

Flexion movements of the lumbar spine are not hazardous if the movements remain strictly in the sagittal plane. The discs and zygapophyseal joints are well designed to withstand this movement. More over biomechanical studies have failed to demonstrate injury to the intervertebral disc simply with flexion.

Because the back muscles are the major contributors to controlling or resisting flexion, in principle, they are foremost liable to injuries during flexion. Acute muscle tears may occur during forceful flexion or extension; otherwise, however lumbar spine is intrinsically resistant to injury under these circumstances.

Extension

Several types of injuries may befall the lumbar spine during forceful extension movements. During forceful extension, movement is initially arrested by the inferior articular processes against the lamina. This impaction may cause a chiseling effect on the lamina, resulting in pars inter articular fracture. Otherwise, if lamina resists the impaction, the continuous extension force is dissipated as posterior rotation of contra lateral zygapophyseal joint, which may result in disruption of joint capsule.

Flexion and torsion

The lumbar spine is practically vulnerable to injury during flexion movements combined with torsion. The flexion movements prestress the annulus fibrosis, thereby reducing its capacity to withstand subsequent axial rotation. Mean while, because the zygapophyseal joints are subluxated, smaller portions of their surfaces are in contact to resist rotation. Usually axial rotation occurs around an axis through the vertebral body, but the contralateral zygapophyseal joint soon becomes compressed. Continued torsion results in rotation about an axis through the compressed joint.The contra lateral joint moves backwards and the intervertebral disc shears side ways.

The resultant injuries are several. Subchondral fractures may occur on the compression side as well as overt fractures of the articular process and fractures of pars inter articularis.

Compression

Compression injuries of the intervertebral disc may result from excessive axial loading by gravity or muscle action. Gravitational injuries occur in instances such as a fall on the buttocks. Muscular injuries may result from severe exertion or pulling.

The critical feature of a compression injury is fracture of the end plate. This does not hurt and may heal but initiate the process known as internal disc disruption. The homeostasis of the nucleus pulposus is interfered by an inflammatory response or by an elusive autoimmune mechanism. The matrix of nucleus pulposus undergoes a biochemical and biophysical degeneration. It decreases its water binding capacity and its bracing effect on annulus fibrosus. This leads to subluxation of vertebrae and loss of disc height resulting in the condition called isolated disc resorption.

Disc resorption becomes painful by chemicals or other mechanical means. Inflammatory chemicals from the nucleus pulposus may stimulate the endings of nerve fibers in the outer annulus fibrosus. As fewer and fewer laminae remains to sustain the normal everyday process applied to the annulus fibrosus, the remaining intact fibers have to bear an increasingly greater load. The increasing stress on theses fibers constitutes a mechanical bais of pain from annulus fibrosus.

Physiology of back pain: [101]

Pain in any structure requires the release of inflammatory agents that stimulate pain receptors and generate a nociceptive response in the tissue.

The spine is unique in that it has multiple structures that are innervated by pain fibers. Inflammation of the posterior joints of the spine, the intervertebral disc, the ligaments and muscles, meninges and nerve roots have all been associated with back pain.

These tissues respond to injury by releasing a number of chemical agents that include bradykinin, prostaglandins and leukotrienes. These chemical agents activate nerve endings and generate nerve impulses that travel to the spinal cord.

The nociceptive nerves, in turn, release neuropeptides, the most prominent of which is substance P. These neuropeptides act on blood vessels, causing extravasation, and stimulate mast cells to release histamine and dilate blood vessels. The mast cells also release leukotrienes and other inflammatory chemicals that attract polymorphonuclear leukocytes and monocytes.

These processes result in the classic findings of inflammation with tissue swelling, vascular congestion and further stimulation of painful nerve endings. The pain impulses generated from injured and inflamed spinal tissues are transmitted via nerve fibers that travel through the anterior (from nerves innervating the extremities) and posterior (from the dorsal musculature) primary divisions of the spinal nerves and through the posterior nerve roots and the dorsal root ganglia to the spinal cord, where they make connections with ascending fibers that transmit the pain sensation to the brain.

The spinal cord and brain have developed a mechanism of modifying the pain impulses coming from spinal tissues.

At the level of the spinal cord, the pain impulses converge on neurons that also receive input from other sensory receptors.This results in changes in the degree of pain sensation that is transmitted to the brain through a process commonly referred

to as the ‘gate control’ system. The pain impulses are modified further through a complex process that occurs at multiple levels of the central nervous system.

The brain releases chemical agents in response to pain known as endorphins. These function as natural analgesics. The brain can also block or enhance the pain response by means of descending serotonergic modulating pathways that impact with pain sensations both centrally and at the spinal cord level.

The latter mechanism is felt to be responsible for the strong impact of psychosocial factors on the response to pain and the disability associated with back pain.

The pain centers in the spinal cord and brain can also change through a process known as plasticity which may explain the observation that many patients develop chronic pain that is more widespread than the pathological lesion and continues after the resolution of the peripheral inflammatory process.

Pathological Physiology: [102]

In course of evolution from quadrupted to orthograde animal the relatively straight spine develops forward and backward curves as it yields to the force of gravity.

Cervical and Lumbar: forward.

Thoracic and Sacral: Backward

Paraspinal and glutei muscles maintain the erect spine.

There is continuous minimal muscular contraction called postural tone.

This physiologic curve gives the spine its S shape. It is essential to maintain this curve in all our erect activities failing which spine becomes unbalanced.When spine become unbalanced and displaced a greater number of muscle fibers are pulled into play at more frequent intervals to keep the spine straight thus fatigue develop earlier. This fatigue causes muscle insufficiency as a result of which the spine sags putting the strain on the ligaments and posterior articulating facet. Changes occur at the facet joints and the lumbosacral junction.

Functional Anatomy: [103]

In the upright position spine has a stabilizing action. The body weight is transmitted through the shoulder girdle to the thorax and abdominal cavity. Hydraulic action of which enables the weight to carried towards the pelvis.

Validity of pathological changes in concern with pain: [104]

There is a strong inclination among the clinicians and patients to relate the symptoms of pain to pathological changes in spinal tissues.

Degenerative changes occur in all patients as a part of normal aging process. At age 20 degenerative changes are noted on X-ray and MRI in less than 10 percent of population. By age 40 such changes are seen in 50 percent of the asymptomatic population and by age 60 this number reaches over 90 percent.

Pathology in the intervertebral disc can also exist in the absence of symptoms. Disc protrusion or herniation can be found in 30-50 percent of the population in the absence of symptoms. Even large and dramatic disc herniation and extrusions can be found in asymptomatic individuals.

NIDANA

The word nidana is derived from the Sanskrit Dhaatu 'Ni' which indicates that 'to determine' (Ni-Niscaya deeyate jnaanam). The word nidana refers to etiopathogenesis of the disease.

In general the nidana has been classified into three types.

Asatmendriyaartha samyoga, Prajnaparadha, Parinama

Furthuremore the Nidana can be classified into samanya and vishesha nidana.

In case of vatavyadhi the etiological factors of all the vatavyadhis are almost similar. But the Samprapti and clinical presentation is unique for each Vatavyadhi, distinguishing them from each another[105].

As the katishool is one of the vatavyadhi the nidana for the vatavyadhi ingeneral are applicable for katishool.

Charaka[106] and Bhavaprakasha[107] clearly mentions the causative factors of Vatavyadhi; whereas in Sushruta samhita, Ashtanga Sangraha and Ashtanga Hrudaya causative factors of provoked Vatadosha are available [108,109,110,111,112.]

In addition to these Charaka and Vagbhata has mentioned Dhatukshaya and Margavarodha to be the root cause of all the Vatavyadhis [113,114,115.]

Therefore, all the etiological factors of Vatavyadhi as well as Vata Prakopa are taken as Nidana of Katishool and the same is elaborated in the following subtitles.

Aaharaja (dietetic factors)

Viharaja (behavior factors)

Aagantuja (external factors) and

Anya Hetuja (miscellaneous factors)

Hetu (Etiological factors) of Va

ta Prakopa and Vata Vyadhi so also Katishool

Table no.:15

(A)Aaharaja(Dietetic causes)

Dravyatah (Substantial)	**Ca**	**Su**	**A.S.**	**A.H.**	**B.P.**
Aadhaki (Cajanus cajan)	-	+	-	-	-
Bisa (Nelumbuo nucifera)	-	+	+	-	-
Chanaka (Cicer arietinum)	-	-	+	-	-
Chirbhata (Cuccumus melo)	-	-	+	-	-
Harenu (Pisum sativum)	-	+	-	-	-
Jaambava (Eugenia jambolena)	-	-	+	-	-
Kalaya (Lathyrus sativus)	-	+	+	-	-
Kalinga (Holarrhena antidysenterica)	-	-	+	-	-
Kariya (Capparis decidua)	-	-	+	-	-
Koradusha (Paspalum scrobiculatum)	-	+	-	-	-
Masoora (Lens culinaris)	-	+	-	-	-
Mudga (Phaseolus mungo)	-	+	-	-	-
Nishpaava (Dolichos lablab)	-	+	-	-	-
Neevara (Hygroryza aristata)	-	+	-	-	-
Shaluka (Nelumbium speciosum)	-	-	+	-	-
Shushkashaaka (Dry vegetable)	+	+	-	-	-
Shyaamaka (Setaria italica)	-	+	-	-	-
Tinduka (Diospyros tomentosa)	-	-	+	-	-
Trunadhaanya (Grassy grain)	-	-	+	-	-
Tumba (Lagenaria valgaris)	-	-	+	-	-
Uddalaka (A variety of Paspalum scrobiculatum)	-	+	-	-	-
Varaka (Carthamus tinctorius)	-	+	-	-	-
Viroodhaka (Germinated Seed)	-	-	+	-	-

II. Gunatah

	Ca	Su	A.S.	A.H.	B.P.
Rukshanna (ununctous diet)	+	+	+	+	+
Laghvanna (light diet)	-	+	+	-	+
Gurvanna (heavy diet)	-	-	+	+	-
Sheetaanna (cold diet)	+	-	+	-	-

III. Rasatah

	Ca	Su	A.S.	A.H.	B.P.
Kashaayaanna (astringent taste)	+	+	+	+	+
Katvanna (acrid taste)	+	+	+	+	+
Tiktaanna (Bitter taste)	+	+	+	+	+

IV. Maatratah

	Ca	Su	A.S.	A.H.	B.P.
Abhojana (fasting)	+	+	-	-	+
Alpaashana (dieting)	+	-	+	+	-
Vishmaashana (Taking unequal food)	-	+	-	-	-

(B) Vihaaraja (Behaviour)

I. Karmatah:

1. Mithyayogatah:

	Ca	Su	A.S.	A.H.	B.P.
Ashmabhramana (Whirling stone)	-	-	+	-	-
Ashmachalana (Shaking of stone)	-	-	+	-	-
Ashmavikshepa (Throwing of stone)	-	-	+	-	-
Ashmotkshepa (pulling down stone)	-	-	+	-	-
Balavat vigraha (wrestling with superior healthy one)	-	+	+	-	-
Damyagaja nigraha (subduing untameable elephant) cow and horse	-	-	+	-	-
Divaasvapna (day sleep)	+	+	-	-	-
Dukhaasana (uncomfortable sitting)	+	-	-	-	-
Dukhashayya (uncomfortable sleeping)	+	-	-	-	-
Ghadhotsadana (strong rubbing)	-	-	+	-	-
Kashtabhramana (whirling of wood)	-	-	+	-	-

Kashtachalana (shaking of wood)	-	-	+	-	-
Kashta vikshepa (throwing of wood)	-	-	+	-	-
Kashtotkshepa (pulling down wood)	-	-	+	-	-
Lohabhramana (whirling of metal)	-	-	+	-	-
Lohachalana (Shaking of metal)	-	-	+	-	-
Lohavikshepa (Throwing of metal)	-	-	+	-	-
Lohotkshepa (Pulling down metal)	-	-	+	-	-
Paragatana (Strike with others)	-	-	+	-	-
Shilabhramana (Whirling of rock)	-	-	+	-	-
Shilachalana (Shaking of rock)	-	-	+	-	-
Shilavikshepa (Throwing of rock)	-	-	+	-	-
Shilotkshepa(Pulling down rock)	-	-	+	-	-
Bhaaraharana (Head loading)	-	+	+	-	-
Vegadharana (Voluntary suppression of natural urges)	+	+	+	+	+
Vegodeerana (Forceful drive of natural urges)	-	-	+	+	-
Vishamopachara (Abnormal gestures)	+	-	-	-	-

2. Atiyogatah*:*

	Ca	**Su**	**A.S.**	**A.H.**	**B.P.**
Atigamana (excessive walking)	+	-	+	-	-
Atihaasya (Loud laughing)	-	+	+	+	-
Atijrumbha (Loud yawning)	-	+	+	+	-
Atikharacapakarshana (Violent stretching of the bow)	-	-	+	+	-
Atilanghana (Leaping over ditch)	+	+	+	-	-
Atiplavana (Excessive bounding)	+	+	-	-	-
Atiprabhaashana (Continuous talking)	-	-	+	+	-
Atipradhaavana (Excessive running)	+	+	-	-	-
Atiprajaagarana (Excessive awakening)	+	+	+	+	+
Atiprapatana (Leaping from height)	-	+	-	-	-
Atiprapeedana (Violent pressing blow)	-	+	-	-	-
Atipratarana (Excessive swimming)	-	+	+	-	-

Atiraktamokshana (Excessive Blood letting)	-	-	-	-	+
Atisrama (over exertion)	-	-	-	-	+
Atisthaana (standing for a long period)	-	+	-	-	-
Ativyaayaama (Violent exercise)	+	+	+	+	+
Ativyavaaya (excessive sexual intercourse)	+	+	+	+	+
Atiadhyayana (excessive study)	-	+	+	-	-
Adyaasana (sitting for a long period)	-	+	-	-	-
Atyuccabhaashana (speaking loudly)	-	-	-	+	-
Gajaaticarya (excessive riding on elephant)	-	-	+	+	-
Kriyaatiyoga (excessive purification therapy)	-	-	+	+	+
Paadaaticarya (walking long distances)	-	+	-	-	-
Rathaticarya (excessive riding on chariot)	-	+	-	-	-
Turan'gaaticarya (excessive riding on horse)	-	+	-	-	-

II. Manah:

	Ca	**Su**	**A.S.**	**A.H.**	**B.P.**
Bhaya (fear)	+	-	+	+	+
Chinta (worry)	+	-	+	-	-
Krodha (Anger)	+	-	-	-	-
Mada (Intoxication)	-	-	-	-	+
Shoka (Grief)	+	-	+	+	+
Utkantha (Anxiety)	-	-	+	-	-

III. Kalatah:

	Ca	**Su**	**A.S.**	**A.H.**	**B.P.**
Abhra (cloudy season)	-	+	-	-	-
Aparaahnna (evening)	-	+	+	+	+
Apararatra (the end of the night)	-	-	+	+	-
Greeshma (summer season)	-	-	+	+	-
Pravata (windy day)	-	+	+	-	-
Shishira (winter)	-	-	-	-	+
Sheetakaala (early winter)	-	+	-	-	+
Varsha (rainy season)	-	+	+	-	+

(C) Aagantuja:

	Ca	Su	A.S.	A.H.	B.P.
Abhighata (trauma)	+	-	-	-	-
Gaja, Ushtra, Ashvasrnghrayanapatamsana (Falling from speedy, running elephant, camel and horse)	+	-	-	-	-

(D) Anya hetu:

	Ca	Su	A.S.	A.H.	B.P.
Aama (undigested article)	+	-	-	-	+
Asruk kshaya (loss of blood)	+	+	+	-	-
Dhaatukshaya (loss of body elements)	+	-	-	-	-
Doshakshaya (depletion of dosha)	+	-	-	-	-
Rogaatikarshana (emaciation due to disease)	+	-	-	-	-
Gadakruta mamskshaya (wasting due to disease)	-	-	-	-	+

Samprapti:

The dosha are the prime causative factor for all the diseases. In katishoola the vata dosha is the major factor behind the whole pathogenesis. Here the vitiated vata dosha resides in the Katipradesha causing pain, stiffness and restricted range of movement of back.Here the shoola is the main presenting symptom which is indicator of involvement of vata dosha. As stated earlier all the nidanas of vatavyadhi and vata prakopa are applicable as a nidana of katishoola.

Acharya Charaka explained that due to the intake of vatakara ahara vihara, vata vitiation take place. This vitiated vata get resides into rikta srotas i.e. srotas in where shunyata of snehadi guna is present, While commenting on word 'Riktata' Chakrapani says that 'Riktata' means lack of Snehadiguna. When the vata get reside into the rikta srotas causes the disease related to that Srotas.[116]

Acharya Vagbhata stated that dhatukshaya aggravates vata and the same is also responsible to produce riktata of srotas. Thus the vitiated Vata travels throughout the body and settles in the rikta srotas and further vitiates the srotas leading to the manifestation of vata vyadhi. [117]

Samprapti of Katishoola can be explained and understood based on Shat kriya kalas – Sanchaya, Prakopa, Prasara, Sthanasamshraya, Vyaktha and Bhedavasthas.

Sanchaya Avastha:

This stage represents the beginning where the doshas stated to have accumulated and stagnated in its own Sthaanas. In this context, the person may feel an aversion towards those factors responsible for the chaya of vata. When this stage is neglected or proper measures are not adopted then it enters the second phase of prakopa.

Prakopa Avastha:

Vilayana roopa vrudhi or increased quantity of aggravated dosha, which is confined to its own location, constitutes the prakopa avastha. In the present context the vatakara nidanas like balavadvigraha, ativyayaama, stressfull activities of back, vatakara aahara etc. leads to further aggravation and excitation of vata dosha creating foundation for manifestation of a katishoola i.e. vatavyadhi.

Prasara Avastha:

In the present context when the excited vata spreads to the katipradesha i.e., the snayu, peshi, asthi of katipradesha occasionally causing pain, stiffness.So by these things we can understand that the first three stages of kriya kala includes the vague and varied presentation of symptoms which does not give enough ground to diagnose it as Katishoola.

Sthana samshraya avastha:

In this stage the vitiated doshas get residence at the afflicted places in the body. In this context, various Vatakara Nidanas especially those giving undue strain to the katipradesha produces srotovigunata in the channels present there. The vitiated vata dosha undergoes localization at the site of khavaigunya. Here the dosha vitiates the dushya (asthi, snayu, peshi, majja) by confining itself to the katipradesha. The resultant symptoms of pain and stiffness are occurs in a mild form distinctive of poorvaroopa of vata vyadhi i.e. katishoola.

Vyakta avastha:

Here the dosha vitiates the dushya (asthi, snayu, peshi, majja) by confining itself to the katipradesha and manifest as a disease. This stage is marked by the presence of pain, stiffness and restricted range of movement.

Bhedavastha:

As the negligence continues the disease proceeds into more severe forms due to extensive dhatukshaya.It finally attains asadhyata in this stage. This stage can make the condition worse by manifestation of degenerative changes in the dooshyaas (asthi) which are irreversible.

Samprapthi of Katishoola

NIDANA SEVANA

!!

DHATUKSHAYA and VATAPRAKOPA

!!

KHAVAIGUNYA IN KATI

!!

STHANASAMSHRAYA IN KATI

!!

KATISHOOLA

Table No: 16 Samprapti Ghatakas of Katishoola

•Dosha	Vāta Vyana Apana (Vrudhi)
•Dushya	Dhaatu Asthi, Mamsa, Majja
	Upadhaatu Snayu
•Udbhava sthaana	Pakwaashaya
•Vyakta sthaana	Kati
•Sancharasthana	Sharira
•Srotas	Asthivaha
•Mārga	Madhyama roga marga

Poorvaroopa:

Poorvaroopa are indications of forthcoming diseases. They occur prior to complete manifestation of disease.[118] Acharya Charaka opines that in general the avyakta laxana (no symptoms), or the occurrence of symptoms at minimal severity is the poorvaroopa for vatavyadhi.[119] So here in the context of katishoola the occasional occurrence of back pain, stiffness are the poorvaroopa.

Roopa:

Roopa appears in the vyaktaavastha i.e., fifth kriyaakaala of the disease. Katishoola being a vatavyadhi is characterized by pain, stiffness at the katipradesha and restricted range of movement of kati. These symptoms manifest in a clear and distinguishable form. The term katishoola itself is selfexplanatory causing shoola i.e. pain at katipradesha. The condition is such that almost all the movements at the katipradesha i.e. the low back region are afflicted preventing the person from performing his day-to-day activities. Acharya Charaka has indicated the various vatavyadhis, which can occur according to the hetu and sthana vishesha, other than those he has explained in detail.[120]

Shoola:

The term 'Ruka elaborated in vata karma, by ashtanghraday, while commenting on that both commentator arunadatta and hemadri termed it as shool[121].'

In a typical case, pain is confined to the katipradesha or the Lumbo sacral and sacroiliac region only. Pain can arise due to the vitiated vyaana vata. If the vitiation is due to any abhighaata pain can manifest because of injury to the sandhi as well as the surrounding structures. Radiation of pain towards the lower limb is not seen in a typical case, but can be found in few low back disorders.

Upashaya, anupashaya and sadhyaasadhyata:

Upashaya for katishoola has not been mentioned particularly. However the upashaya and anupashaya mentioned for vatavyadhi can be considered as same for katishoola. It is essential to know the Sadhyasaadhyata of a disease before the treatment. Acharya Charaka says, "A physician who can distinguish between curable and incurable diseases and initiate treatment in time with the full knowledge about the various aspects of the therapeutics can certainly accomplish his object of curing the disease.[122]

The disorders of Vata have been termed as mahagadha and the condition, which are associated with kunjana, sandhichuti, kubjata, amsasamshosha, panguta, and stambha then they are amendable to intensive appropriate treatment or even sometimes becomes incurable. It is further stated that when the patient has sufficient strength and without any complications and if the disease is treated in earlier stage, then it can be cured.[123]

Sushruta considers the Vatavyadhi as Mahagada due to its tendency to be fatal or incurable. Vagbhata calls it as Mahaaroga. Most of the Aacaaryas has told that

Vatavyaadhi, generally are very difficult to cure .[124,125]Sushruta mentions that a patient of Vatavyaadhi, if develops the complications like Shoona (oedema/inflammation) Suptatwacha (Tactile senselessness), Bhagna (fracture), Kampa (tremors) Aadhmaana (distension of abdomen with tenderness) and pain in internal organs, then he does not survive.[126]

Lowbackache [127]

Backache and leg pain are known since beginning of history.

Primitive culture called it a work of demon.

Greeks recognized the symptoms as a disease.

In the 18th century, Cotumis attributed pain to the sciatica nerve.

In 1881 Lasegue test described a test to distinguish hip disease from sciatica.

Goldwait in 1911 first attributed backpain to posterior displacement of disc.

Nuchenson in 1964, White and Punjabi in 1982 described biomechanics of spine.Schnack in 1983 described clinical anatomy.

Causes of lowbackache: [128, 129]

The causes of low backache can be classified into common and uncommon;

Common causes:

Back muscle sprain

Prolapsed lumbar intervertebral disc

Obesity

Poor posture

Facet joint arthritis

Unaccustomed activities

Occupational causes

Uncommon causes:

Congenital causes: scoliosis

Spina bifida

Spondylolisthesis

Infective condition: Osteomyelitis

Tuberculosis

Traumatic causes: Vertebral body injuries

Posterior arch factor

Muscle sprain/ strain

Prolapsed disc

Inflammatory causes:	Rheumatoid arthritis
	Ankylosing spondylitis
Neoplasms: benign –	osteoid osteoma
	Malignant-secondaries, multiple myeloma
Metabolic causes:	osteoporosis
	Osteomalacia
Degenerative conditions:	osteoarthritis
	Lumbar spondylosis
Referred pain from:	Gynecological diseases
	Genitourinay disease
	Gastrointestinal disease.

Types of low back pain: [130]

1) Local pain
2) Pain referred to the spine
3) Pain of spine origin referred to legs and gluteal region
4) Radicular pain
5) Muscular spasm

1) Local pain:

Local pain is caused by processes that compress or irritate sensory nerve endings. They are usually due to fractures, tears or stretching of pain sensitive structures. The site of pain is near to the affected part of spine. Local pain does not change according to the position suggests spine tumor or infection.

2) Referred pain

It may arise from pelvis or abdomen (this usually occurs from abdomen or pelvis) and rarely radiates to spine.

3) Pain of spine origin referred to legs and gluteal region

Disease occurring in upper lumbar region may refer pain to the lumbar region, groin or anterior thighs. Disease affecting lower lumbar spine may produce pain radiation to buttocks, thighs or rarely calfs & feet.

4) Radicular pain:-

It is usually sharp and radiates from the spine to within the territory of nerve root. Coughing, sneezing often produces this pain. Patients observe increase in pain during postural changes sitting stretches the sciatica nerve (L5&S1roots), because the

nerve passes posterior to the hip. Femoral nerve passes anterior to the hip. Its root from L2, L3.and it is not stretched during sitting position.

5) Muscular spasm

The pain associated muscle spasm although obscure in origin, is commonly associated with many spinal disorders. Abnormal postures, para spinal muscles, and dull pain accompany the spasms.

Structures involved in backache: [131]

Vertebral bodies

Intervertebral disc

Posterior intervertebral joints

Ligaments and small intervertebral muscles

Posterior longitudinal ligament

Nerves

Management of low backache: [132]

Conservative Therapy:

Absolute bed rest

NSAID

Muscle relaxant

Ice pack

Anti-depressent

Exercises: As the pain decrease isometric abdominal and lower extremity exercises are begun. If the pain decreases by extension then extension exercises are recommended.

If the paindecrease by flexion then flexion exercises are recommended.The improvement in symptoms with extension is indication of a good prognosis with conservative care.Lower extremity exercises increase the strength and relieves the stress on back.

Exercises pump the disc and increase water content. It relieve the muscle spasm and increase motion .It stretches and mobilizes the facet joint. Repetitive motion helps the patient to overcome the fear of movement.Exercise decrease the swelling around the nerves.

Traction: Skin traction

Pelvic traction

The traction is helpful as it relieves muscle spasm.It may distracts the facet joint and disc space and helpful in relieving pain.

Contraindication to traction: Hypertension, peripheral vascular disease, cataracts, glaucoma, copd, preganancy.

Epidural steroids: Injecting a long acting steroid and local anaesthetic into the epidural space. Its effect last for three weeks and is useful for subacute and chronic cases

In vogue since 1950.

Effective in approximately 50% patient with low backache.

It decreases inflammation and flushes out inflammatory protein thereby reducing pain. It helps in better back rehabilitation. Maximum of three injections in year with two week gap is given. Adverse effect includes infection, dural puncture, arachniditis.After injection patient adviced one day rest.

Surgery:

Absolute indication: failure of conservative management.

Marked progressive weakness of muscle.

Progressive neurological deficit.

Cauda equina paralysis.

Relative indication: recurrent episodes of incapacitating sciatica.

Pain unrelieved by complete rest from activity.

Surgical Method:

Laminectomy and disc excision.

Hemilaminectomy

Fenestration surgery

Microscopic lumbar discectomy

Laser discectomy

Percutaneous discectomy

Total disc replacement.

2.3 Drug Review

Nirgundi is the herb which has been widely used in ayurveda for treating the various diseases. This drug has been included under different gana/ varga in different classics.

निर्गुण्डि : निर्गुण्डिति अत्यन्तं रक्षति इति वा, गुडि रक्षायाम

Classical categorization:

Charaka Samhita	-	Vishagna gana , Krimigna gana
Susruta	-	Surasadi gana
Vagbhata	-	Surasadi gana
Rajanighantu	-	Shatahvadi varga
Dhanvantari Nighantu	-	karaviradichaturtho varga
Kaiyadeva Nighantu	-	Aushadi Varga
Bhavaprakasha	-	Guduchyadi Varga.
Nighantu Adarsha	-	Nirgundyadi Varga.

SYNONYMS: [1, 2, 3]

A synonyms is a word having the same meaning and significance as another.The knowledge about different synonyms in the study of drug is very essential.

The Synonyms of Nirgundi are:

Nirgundi: That which protects from number of diseases.

Shefali: That which is liked by insects and flowers are blue in colour.

Subaha: The flowers are blue in colour or that which purifies the body.

Sinduvar: It checks the accumilations of fluid in the body.

Indrasurasa: The swarasa is an effectic drug.

Indrayani: The leaf juice is an efficacious drug.

Sugandhika: The leaves have aroma.

Bhutakeshi: Eliminates evil organisms.

Sheetasaha: Plant resistant to cold.

Indranik: This drug is a creation of lord Indra.

Varities: The following types of nirgundi are described by various scholars:

Sushruta has quoted 2 types of Nirgundi.

1. Shwetha Pushpa
2. Neela Pushpa

Dalhna has quoted 2 types

1. Nirgundi
2. Sindhuvara

According to Dhanvantari Nighantu : 2 types

1. Shweta
2. Neela

According to Bhavamishra 2 varieties

1. Shwetapushpa (Sinduvara)
2. Neelapushpa (Nirgundi)

According to Kaiadeva Nighantu 3 varieties

1. Nirgundi
2. Sinduvara
3. Shephalika

According to Sodhala Nighantu 2 types

1. Sinduvara
2. Shephalika

Accordin to Raja narahari 3 types

1. Sindhuvar
2. Neela Nirgundi
3. Shephalika

According to Nighantu Ratnakara 2 types

1. Karthari Nirgundi
2. Aranya Nirgundi.

According to Nighantu sangraha 4 varieities,

1. Sinduka / Sindhuvaraka – White variety
2. Neela Nirgundi – blue
3. Bhuthakeshi (Kartharipathra) – Plant with serrated leaves.
4. Vanaja – grown in forest 2 types 1. Krishna 2. Shukla (also called Marutpatri, vanakedhrani)

Nomenclature: [4, 5, 6.]

Sanskrit Name	:	Nirgundi
Botanical Name	:	Vitex negundo,Linn.
Family	:	Verbenaceae
Genus	:	Vitex

Species	:	Negundo
Botanical Synonyms	:	Vitex Trifolia.

Vernacular name: [7]

The name of drug in different languages of India and few foreign languages are given below.

Sanskrit Name	:	Nirgundi
Hindi	:	Sambhalu
English	:	Five- leaved chaste tree
Gujarathi	:	Nagod
Kannada	:	Nekki, Lakkigida
Telugu	:	Vavili, Nallavavili
Bengali	:	Nishinda
Tamil	:	Nochchi, Karunochchi
Malayalam	:	Indrane
Marathi	:	Nirgud
Arabic	:	Aslak
Persian	:	Panjagusta

Morphology: [8, 9]

Vitex negundo Linn. is shrub growing to about 3 m – 4m in height or more often a large shrub.

Trunk : The trunk is irregular about 20 cm. in diameter. Branches thin, opposite; branchlets quadrangular, whitish downy with fine tomentum.

Leaves: The leaves are 2.5-12cm * 1-4 cm in dimension. Leaves on crushing give a typical smell.Trifoliated nirgundi is used instead of bel leaves. The upper surface of the leaf is green and the lower surface light voilet coloured in some varieties.

Flowers: The flowers are small, in clusters, blue coloured and are four in number

Overy: The ovary is divided into 2-4 compartments.

Fruit: The fruit is round in shape and becomes black when ripe.

Seeds: Non- endospermic, oblong or obovate with rather thick testa and an erect embryo with fleshy cotyledons.

Flowering and fruiting:

Even though the flowering duration of plant is a greater part of year, the flowering occurs from March to June. In general the flowering stage begins during summers and rains, and fruiting during cold season.

Distribution and habitat:

'Nirgundi' is found throughout India. It grows almost everywhere in dry districts and up to an elevation of 1500 metres, in the hills but grows best under moist situations. It has been recorded occuring in sind, upper gangetic plain ascending to nearly 1500 metres in North West Himalayas, Mumbai, Konkan, Deccan, Madras and Kerala State, North Bengal, Chotanagpur, Bihar, Sunderbans etc.

Chemical constituents:

Leaves contain volatile essential oil and resin. Fruit contains acidic resin, astringent. Phenol, Dulcitol, Alkaloid – vitricine, β Sitosterol, Comphene,

α & β – Pinenes, Angoside, Aucubin, Casticin, Artemesin, Orientin.

Useful parts:

The useful parts of the nirgundi are –

Patra (Leaves)

Beeja (Seeds)

Moola Twak (Root bark)

Pushpa (Flowers)

Hence the whole plant is useful

Tree with serrated leaf type is preferable.

Microscopic: [10]

Root shows 10 to 18 or more tangential rows of rectangular to cubicular, moderately thick-walled cork cells with a few rows of radially arranged cork cells also being present, inner 3 to 5 rows of cork cells thin-walled; cork cambium consists of single row of squarish to transversely elongated cells; secondary cortex composed of 4 to 12 rows of rectangular to elongated cells, some contain starch grains; numerous, small groups of stone cells found scattered in this zone; stone cells vary in shape and size; secondary phloem consists of sieve tubes with companion cells, fibres and phloem parenchyma traversed by phloem rays; distal portion of phloem conical, due to dilating phloem rays; each band of phloem composed of thin-walled, phloem tissues alternating with transverse strips of thick-walled phloem fibres; a few tangential strips of obliterated phloem tissues also present in outer-phloem region; each fibre group composed of 6 to 60 or more thick-walled, long and short fibres, short fibres comparatively thick-walled, a few fibres show forked tips; inner zone of phloem composed of intact, thin-walled, phloem tissues mainly sieve tubes,

companion cells and phloem parenchyma; cambium composed of one, or sometimes two, rows of cells; central major part of root consists of xylem; vessels varying in size, scattered throughout xylem region, either in small groups of 2 to 4 or singly; a few xylem vessels show tail on one or both the ends; xylem fibres long, having thick-walls and pointed tips; xylem parenchyma contains starch grains similar to those found in cortical region; medullary rays are uni-to triseriate, almost straight, extend from pith to cork, medullary rays in xylem region radial while in phloem region they dilate; cells contain starch grain, simple and compound, oval to circular, having 4 components and measuring 8 to 12 μ in dia.

Pharmacodynamics:

- Rasa – Rasa are the virtues of Dravya expressed soon after they come in contact with tongue. When not revealed or slightly revealed/revealed at the end, it is called as Anurasa
- Guna - Guna are the qualities possessd by the matters which are incapable of independent action.
- Veerya - It is the potential strength of the drugs gained by natural inheritance/ acquired by processing in terms of guna present in it.
- Vipaka – The transformation of rasa by digestive fire after complete digesion in G.I.T is called as vipaka.

The Rasa – Guna- Veerya – Vipaka of Nirgundi is given below [11, 12, and 13.]

निर्गुण्डि कटुतिक्तोष्णा कृमिकुष्टरूजापहा □
वातश्लेष्मप्रशमनी प्लीहाजुल्मारूचीर्जयेत □ध. नि.
सिन्दुक□मृतिदस्तिक्त□कषाय□कटुको लघु□□
केश्यो नेत्रहितो हंन्ति शूलशोथाममारूतान □भा.प्र.

- Rasa : Katu,Tikta
- Guna : Laghu, Ruksha
- Veerya : Ushna, Pushpa - Sheeta
- Vipaka : Katu;

Karma: [14]

- Dhosakarma :Vatakapha shamaka, Vedanasthapaka, Vataghna, Shothahara, Vranashodhana, Vranaropana, Kushtagna, Kandugna, Medhya, Kaphagna ; Kasaharana, Mutrajanana, Artavajanana, Balya, Rasayana, Amapachana,

Keshya, Janthughna, Deepana-pachana, Amapachana, Yakrath Uththejaka, Krumighna, Vishaghna, Dantachalaghna.

Systemic action:

External: [15]

It is a best Vedanastapaka (analgesic)

Shothahara

Vranashodhaka and Vrana ropaka (antiinflammatory)

Keshya (hair tonic)

Janthugna (anthelminthic)

Balya and rasayana

Internal: [16, 17.]

Nervous System: Being a vatanashaka dravya it is vedanasthapaka and medhya. It is an analgesic, brain tonic and alleivates vata, therefore useful in headache, sciatica, improves memory.

Digestive System: Since it has katu tikta and ushna properties it does deepana, amapachana, yakrithuththejana and is krimighna. It is usefull in loss of appetite, anorexia, aamdosha, hepatitis, and is anthelmintic.

Circulatory system: Since it is kaphavathashamaka it acts as shothahara. White flowered nirgundi is used in oedema induced by kaphavata.

Respiratory system: As it is having katu tikta rasa, it acts as kaphaghna and kasahara. It is useful in kasa, asthama, pneumonia and pleurisy.

Urinary system: It is having mutrajanana (diuretic) property. It is useful in dysuria, anuria and gonorrhoea.

Reproductive system: Being ushna it does ArthavajananaIt improves menstrual flow therefore useful in dysmenorrhoea.

Skin: It is kushtagna and kandugna. It is useful in urticaria and eruptions.

Temperature: It helps in reducing jvara and it is specially acts as vishamajvara prathibandhaka.It is useful to reduce fever, used as anupana or main drug in typhoid and malaria fever.

Eye: It is chakshushya and improves vision.The leaf juice is installed in conjuctivitis.Surana is prepared from seeds.

Ear: It reduces Karnasrava. Nirgundi oil is useful in reducing pain, oozing, inflamation and fungal infection of ear.

Satmikarana: It is balya and rasayana. Every part of body is stimulated therefore it acts as a rasayanin body.

Therapeutic uses:

In Vatavyadhi:

a) In Kativata: Nirgundi svarasa and Eranda thaila mixed and given to drink.[18]

b) In Sandhivata, Kativata and Kampavata : Nirgundi moola churna, 1 thola with tila taila given as a drink.[19]

c) In Grudhrasi : Nirgundi Patra kwath prepared in Mandagni is given to drink.[20]

In Kshaya Nirvyadhikarana : Ghrita prepared with samulapatra phala svarasa of Nirgundi.[21]

In Apasmara : a. Nasya with the svarasa of vandaka which grows in Nirgundi vraksha. [22]

b. Nirgundi mula is used [23]

In Nadivrana and Anilarti and Kusta : Nirgundi Mula and Patra svarasa with equal parts of taila is prepared and given to drink and used as Abhyanga in case of Pama, Apachi, Nadivrana.[24]

In Snayuka Roga : a. Nirgundi patra svarasa with grithapana.[25]

b. Goghrita pana for first 3 days and another 3 days Nirgundi svarasa pana.[26]

In Gandamala : a. Nasya with Nirgundi mula by triturating it with water.[27]

b. In Daruna gandamala taila prepared with Nirgundi svarasa and langali mula kalka is given as Nasya.[28]

c. Nirgundi taila is used [29]

In Kasa - Shvasa : Ghrit prepared with nirgundi patra svarasa cures kaphajakasa. [30]

Nirgundi Patra niryasa saditha ghrita in kasa and with ghrit and vidanga svarasa cures vyoshagarba.[31]

In putikarna	:	Nirgundi patra svarasa sidhdha taila, Saindhava, grihadhuma and guda with madhu. Karnapurana is done.[32]
In suthika roga	:	Kashaya which is prepared by lashuna, shunti, paste of pippali and nirgundi is given to drink.[33]
In sarpavisa	:	Sinduvara mula svarasa for pana in darvikara bite and also as nasya with madhu.[34]
In Mushika visha	:	Sindhuvara with madhu is given to lick .[35]
In samanya visha	:	Shirisha and sindhuvara is used for lepa.[36]
In shleshma jvara	:	a. Sinduvaradala kvata with trikatu is given to drink [37] b. Sinduvaradalakvata with pippali is given to drink..[38]
In Rakta pitta	:	Nirgundi patrankura samskrutha grita.[39]

Recent Researches about Nirgundi.

The isolated flavonoids from vitex negundo indicates good antioxidant and therapeutic potential in modulating biochemical parameters against selenite induced cataract.[40]

The leaf hexane extract of vitex negundo has a potential to be useful as a eco friendly approach to control the Anopheles subpictus Grassi and Culex tritaeniorhynchus Giles.This indicate the mosquito larvicidal activity of leaf extract of Nirgundi.[41]

The ehanolic extract of leaf vitex negundo shown a hepatoprotective activity against the antitubercular drug induced hepatotoxicity.[42]

Negundoside (2-p-hydroxybenzoyl mussaenosidic acid) an irridiod glycoside from the leaves of vitex negundo has been shown a protective effect on human liver cells against the calcium mediated toxicity induced by carbon tetrachloride.[43]

The highest percentage of lauric acid, palmitic acid, stearic acid, oleic acid and linolenic acid were recorded in vitex negundo. The fatty acid methyl ester(FAME) extract of vitex negundo shown a larvicidal activity as 18.64 ppm.[44]

The petroleum ether extract (60-80 degree C) of the vitex negundo leaves act as a potential larvicidal agent against Japanese encephalitis vector C, tritaeniorhynchus. It also act as a promising repellent against various adult vector mosquitoes.[45]

The root methanolic extract of vitex negundo L. at 100 ng/ml concentration has shown the complete loss of motility of microfilariae after 48 hr. incubation.[46]

Thin layer chromatography of the extract has the presence of alkaloids, saponins, and flavonoids in the root of vitex negundo. The vitex negundo had shown the highest estrogenic like activity assessed on cell based proliferation assay. So it could be useful in hormone replacement therapy.[47]

The gas chromatography -mass spectrometry analysed the presence of sixty-six compounds in the leaves of vitex negundo. The main compounds are The main compounds are viridiflorol (19.55%), betacaryophyllene(16.59%), sabinene(12.07%), 4-terpineol(9.65%), gammaterpinene(2.21%), caryophyllene oxide (1.75%), 1-oceten-3-ol (1.59%), and globulol (1.05%).[48]

The ehanolic leaf extract of vitex negundo in sub effective dose potentiate the antiinflamatory activity of phenalbutazone and ibuprofen significantly in carrageenin induced hind paw oedema and cotton pellet granuloma test in albino rats.[49]

The ethanolic extract of leaves of vitex negundo isolated the new flavone glycoside (4) along with the five known compound 1-3, 5 and 6.The new flavone glycoside 4 and compound 5 shown the antifungal activity against Trichophyton mentagrophytes and cryptococcuc neoformanas at MIC 6.25 microg/ml.[50]

Methanolic extract of vitex negundo showed the decrease in the serum urate level.This effect is almost similar to the effect of allopurinol on serum urate level.[51]

The leaves of vitex negundo shown a antihyperglycemic activities at the dosage of 5mg/20g. mouse.[52]

The vitex negundo possesses anticonvulsant activity especially against pentylenetetarazole induced convulsion. The potentiation of diphenylhydantoin and valporic acid by vitex negundo indicates that it may be useful as an adjuvant therapy along with the standard anti-convulsant and can possibaly lower the need of diphenylhyddantoin and valporic acid.[53]

In comparison to standard drug meperidine more than ten times dose of vitex negundo is required to produce comparable significant antinociceptive activity. The subeffective dose of vitex negundo (5mg/kg/po) potentiate the analgesic activity of meperidine and aspirin.Naloxen (1 mg/kg/sc) did not reverse the analgesic effect of vitex negundo extracts The viex negundo possesses the both central and peripheral analgesic activity. [54]

The fresh leaves of vitex negundo have anti-inflammatory and pain suppressing activities mediated via PG synthesis inhibition, antihistamine, membrane stabilizing and antioxidant activities.The antihistamine activity can produce the anti-itching effect.[55]

Chloroform soluble extract of leaves of vitex negundo yields the flavone vitexicarpin which exhibited broad cytotoxicity in a human cancer cell line panel.[56]

The methanolic root extract of vitex negundo linn possess the potent snake venom neutralizing capacity.[57]

2.4 PREVIOUS WORK DONE

"The evaluation of the effect of ketakyadi taila as kativasti in katishoola."

Andanagoud Shekharagoud Patil, 2001 RGUHS Bangalore

Kativasti in Katishoola is said to be best local not raising any adverse influence over patients and relieving individuals in stipulated period of 7 days at remarkable state.

Katakyadi taila as vatahara Chikitsa in the process of kativasti

The efficacy of the katakyadi taila as kativasti in Katishoola is highly significant with its P value < 0.001.

"A Clinical Evaluation Of Kativasthi And Nirgundi Erandadi Kashaya In The Management Of Katigraha"

Dr. Sarat K Babu, 2006 RGUHS Bangalore.

The trial drug combination of Katibasti and Nirgundi Erandadi kashaya showed high significance in decreasing pain, stiffness and tenderness, which was noted completely after follow up(P<0.001).

"Management of Katigraha With Abhadi Churna A Clinical Evaluation" dr. Sarun mohan 2009 rguhs, bangalore"

Trial drug combination of Abhadi Churna showed significant relief in decreasing pain, stiffness and tenderness.

No-where during the clinical period trial drug Abhadi Churna did not show any adverse effect, the drug can be proclaimed safe.

Work power decreases with the chronicity of the disease.

Research Papers

Ref: Ayush research portal

Article ID:8838

Title: Assessment of clinical efficacy of erandamuladi yapan basti and eranda bija ksheerapaka in the management of katigraha w.s.r.t. lumbar spondylosis.

Author: Fernando K Damayanthie et al.

Result: both therapies provided statistically significant result related to osewstry and visual anolouge scale.

Basti provided better increase in range of all four movements(p<0.001) as compared to kshirapaka group.

Ref: Ayush research portal

Article ID: 8271

Title:Effectiveness of kativasthi and exercise in chronic low back pain a randomized control study.

Author: Panda Ashokkumar et al.

Result: There is significant improvement in kativasti than conventional exercise practices.

Ref: Ayush research portal

Article ID: 107412

Title: Evaluation of effect of kativasti in spinal anaesthesia induced low backache.

Author: Richa Tripathi et al.

Result: This study yields significant reduction in symptoms of stiffness, pain, tenderness, lateral flexion, rotation.

3. MATERIALS AND METHODS

To carry out any research work, the selection of an appropriate methodology and materials are very important. The clinical research has an important role in a medicinal fraternity. The research work entitled has been carried out with the following materials and methods

Materials:

In this clinical trial two panchakarma sudation procedures had been included viz., pindasweda and nadisweda. To conduct these procedures the materials required are enlisted below.

Table no.:17

Materials required to conduct a study.

Procedure	Materials required
Pinda sweda	• Nirgundi Patra • Cotton cloth • Tags • Vessels • Tila taila
Nadisweda	• Nirgundi Patra • Vessels • Nadi swedan yantra • Tila taila

Methods:

The methodology is an important to conduct a clinical trial. In this study the methodology has been adopted as follows.

Data collection: The well diagnosed patients of katishoola who fulfill the inclusion and exclusion criteria are selected irrespective of gender, religion, age, and economic status.

Criteria of Diagnosis: Diagnosis has been made on the basis of following signs and symptoms

Table no.:18

Diagnostic criteria:

Katishool
Stambha
Kriya Hani
Sparshasahatva

These sign and symptoms assessed as follows as per assessment criteria

Katishool: oswestry low back pain score.

Stambha: schobers test.

Kriyahani : lateral flexion, Flexion, Rotation

Sparshasahatva : Tenderness

Inclusion criteria:

Table no.:19

Inclusion criteria:

Patients fulfilling the diagnostic criteria.
Duration more than 4 weeks
Patients of both gender aged between 18-60 years.

Exclusion criteria:

Table no.:20

Exclusion criteria:

Patients having associated diseases like Tuberculosis, Fractures, and other complications.
Patients having marked deformities of spinal column. Such as Sacralisation
Spinal stenosis.
Disturbed bowel-bladder control.

. **Investigations:**

- Hematological investigations Hb%, TC, DC, ESR
- Routine Urine investigations.
- Radiological examination of the LS spine in AP and lateral view.

Study Design: This is a clinical study in which the patients of either gender diagnosed as katishoola was randomly allocated into two groups.

Group A: This group has been treated with pinda sweda

Group B: This group has been treated with nadi sweda.

Sample size computation:

Effect size: 0.5

Level of significance: 5%

Power : 0.8

Sample size required: 106

Software used: G* power.

Table no.: 21

Study design.

	Group A	Group B
Purvakarma	♦ Preparation of nirgundi patra pind. ♦ Proper positioning of patient ♦ Abhyanga to katipradesha	♦Preparation of nirgundi patra decoction. ♦ Proper positioning of patient. ♦ Abhyanga to katipradesha.
Pradhanakarma	♦Application of warm patra pind over kati pradesha. ♦ Till getting samyaka swinna lakshanas ♦administration of swedana everyday till swedasrava as it is inherent sign of swedana	♦Application of vapours of decoction over kati pradesha. ♦ Till getting samyaka swinna lakshanas ♦administration of swedana everyday till swedasrava as it is inherent sign of swedana
Precaution	Care should be taken to avoid burns.	Care should be taken to avoid scalds
Paschatkarma	Clean the area.	Clean the area
Duration	7 days	7 days.
Number of patients	53	53

The samyaka swinnata (proper sudation) of patients has been determined on the basis of following symptoms among the both groups.

Table no.: 22

samyaka swinna (proper sudation) laxanas.[1,2,3,4.]

These laxanas assessed on every day by darshan, sparshan and prashna pariksha.

Samyaka swinna laxanas	Measured by as Yes/No	Days						
		1	2	3	4	5	6	7
• Sheetha vyuparama	Sparshan							
• Shoola vyuparama	Prashna							
• Sthambhanigraha	Darshana							
• Gouravanigraha	Prashna							
• Swedasrava	Darshana							
• Vyadhihani	Prashna							
• Laghutva	Prashna							

Meaning of laxanas:

Sheetavyuparam: coldness of area decreased.

Shoola vyuparam: decrease in pain

Stambhanigraha: rigidity decreases and improves movement

Gouravnigraha: decrease in heaviness.

Swedasrav : occurrence of perspiration.

Vyadhihani: declining in the sign and symptoms of disease (in this study vyadhihani assessed by improvement in range of movement and decrease in pain threshold).

Laghutva : feeling of lightness.

Assessment criteria:

To evaluate the effect and role of any therapy in a particular disease an assessment criteria is essential. In a present study following criteria has been used to assess the effect.The effects were observed and noted by adopting standard methods of scoring by means of objective and subjective parameters. The assessment was done before the intervention and thereafter on 8th and 15th day i.e. after follow up.

I. Objective criteria

1. Schober's Test [5]
2. Flexion [5,6,7]
3. Lateral flexion[5,6,7]
4. Rotation [5,6,7]

II. Subjective criteria

1. Pain [7]

2. Tenderness [8]

Method of grading

♦ Schobers test[5]

The schobers test for researcher has been adopted. The mehod to perform this test is as follows,

When the patient is in a standing position make a mark at fifth lumbar vertebrae. Then two points are marked 5 cm below and 10 cm above this mark. Then patient is asked to touch toes while keeping the knees straight.in normal condition the distance of two point increase by atleast 5 cm.

Table no.:23 scoring for schobers test.

Score	Parameter
0	Flexion up to 5 cm and more distance
1	Flexion up to 3 cm distance
2	Flexion up to 2 cm distance
3	Flexion upto 1 cm distance

♦ Lateral flexion[5,6,7.]

Table no.:24 Gradation for lateral flexion.

Score	Parameter
0	Can do lateral flexion easily
1	Can lateral flex with difficulty
2	Cannot perform lateral flexion.

♦ **Rotation** [5,6,7.]

Table no.:25 Gradation for rotation.

Score	Parameter
0	Can rotate easily
1	Rotation with difficulty
2	Cannot rotate.

♦ **Flexion** [5, 6, 7.]

Table no.:26 Gradation for flexion.

Score	Parameter
0	Can do flexion easily
1	Can flex with difficulty
2	Cannot perform flexion.

♦ **Tenderness** [8]

Table no.:27 Gradation for tenderness.

Score	Parameter
0	No pain
1	Patient says it's paining
2	Patient winces
3	Patient winces and withdraws the part
4	Patient does not allow to touch the part

♦ **Pain** [9.]

Oswestry Low Back Pain Score - Orthopaedic Scores [9]

Section 1—Pain Intensity

- I have no pain at the moment.
- The pain is very mild at the moment.
- The pain is moderate at the moment.
- The pain is fairly severe at the moment.
- The pain is very severe at the moment.
- The pain is the worst imaginable at the moment.

Section 2—Personal Care (washing, dressing, etc.)

- I can look after myself normally without causing extra pain.
- I can look after myself normally but it is very painful.
- It is painful to look after myself and I am slow and careful.
- I need some help but manage most of my personal care.
- I need help every day in most aspects of self care.
- I do not get dressed, wash with difficulty and stay in bed.

Section 3—Lifting

- I can lift heavy weights without extra pain.
- I can lift heavy weights but it gives extra pain.
- Pain prevents me from lifting heavy weights off the floor but I can manage if they are conveniently positioned, e.g. on a table.
- Pain prevents me from lifting heavy weights but I can manage light to medium weights if they are conveniently positioned.
- I can lift only very light weights.
- I cannot lift or carry anything at all.

Section 4—Walking

- Pain does not prevent me walking any distance.
- Pain prevents me walking more than 1 mile.
- Pain prevents me walking more than 1/4 mile.
- Pain prevents me walking more than 100 yards.
- I can only walk using a stick or crutches.
- I am in bed most of the time and have to crawl to the toilet.

Section 5—Sitting

- I can sit in any chair as long as I like.
- I can sit in my favorite chair as long as I like.
- Pain prevents me from sitting for more than 1 hour.
- Pain prevents me from sitting for more than 1/2 hour.
- Pain prevents me from sitting for more than 10 minutes.
- Pain prevents me from sitting at all.

Section 6—Standing

- I can stand as long as I want without extra pain.
- I can stand as long as I want but it gives me extra pain.
- Pain prevents me from standing for more than 1 hour.
- Pain prevents me from standing for more than 1/2 hour.
- Pain prevents me from standing for more than 10 minutes.
- Pain prevents me from standing at all.

Section 7—Sleeping

- My sleep is never disturbed by pain.
- My sleep is occasionally disturbed by pain.
- Because of pain I have less than 6 hours sleep.
- Because of pain I have less than 4 hours sleep.
- Because of pain I have less than 2 hours sleep.
- Pain prevents me from sleeping at all.

Section 8—Sex Life (if applicable)

- My sex life is normal and causes no extra pain.
- My sex life is normal but causes some extra pain.
- My sex life is nearly normal but is very painful.
- My sex life is severely restricted by pain.
- My sex life is nearly absent because of pain.
- Pain prevents any sex life at all.

Section 9—Social Life

- My social life is normal and causes me no extra pain.
- My social life is normal but increases the degree of pain.
- Pain has no significant effect on my social life apart from limiting my more energetic interests, e.g. sport, etc.
- Pain has restricted my social life and I do not go out as often.
- Pain has restricted social life to my home.
- I have no social life because of pain.

Section 10—Traveling

- I can travel anywhere without pain.
- I can travel anywhere but it gives extra pain.
- Pain is bad but I manage journeys over two hours.
- Pain restricts me to journeys of less than one hour.
- Pain restricts me to short necessary journeys under 30 minutes.
- Pain prevents me from traveling except to receive treatment.

♦The scoring instruction in regional language are attached in annexure.

♦The score is calculated as percentage and interpreted as follows

Table No. 28 Interpretation of oswestry low back pain score.

Interpretation	Score
Minimal	Upto 25%
Moderate	26-50%
Severe	51-75%
Crippled	76% and above

4. OBSERVATIONS

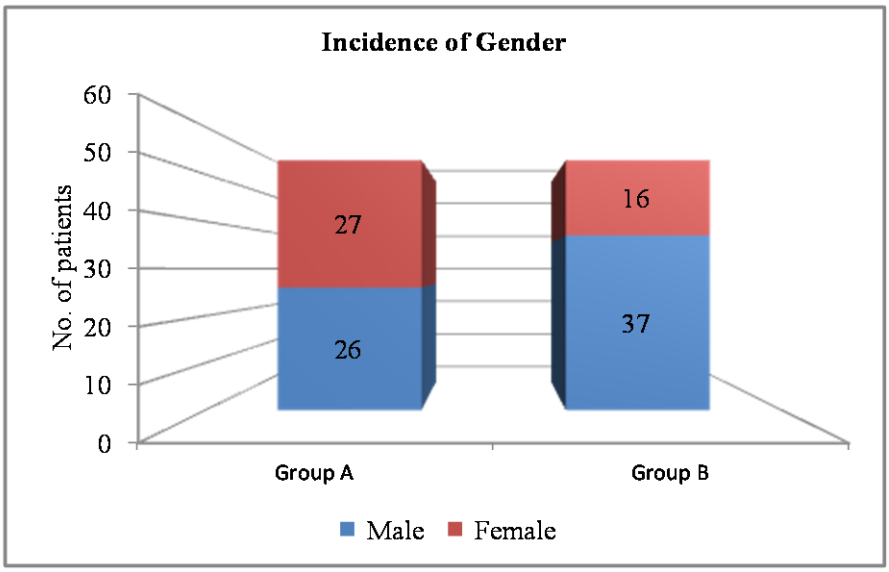
1. Incidence of gender

Table no.:29

Sr. No.	Sex	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Male	26	49.06%	37	69.81%	63	59.43%
2.	Female	27	50.94%	16	30.19%	43	40.57%

In group A, there were 26 males (49%) and 27 patients were female (51%). In group B, 37 patients were male (70%) and 16 were female (30%).

Graph no.: 1



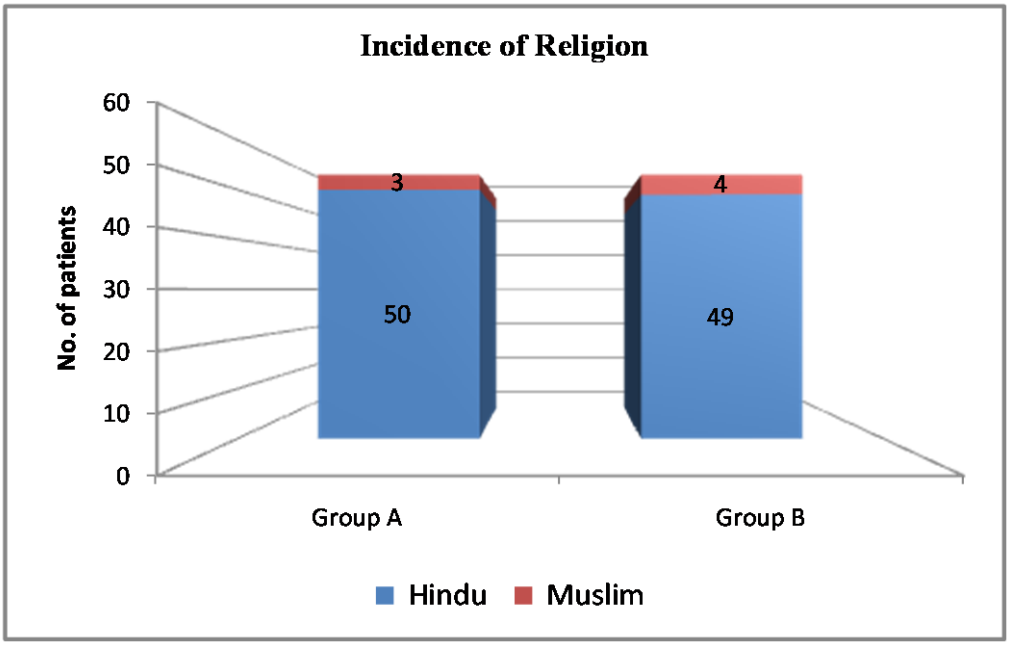
2. Incidence of Religion

Table no.:30

Sr. No.	Religion	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Hindu	50	94%	49	92%	99	93%
2.	Muslim	3	06%	04	08%	07	07%

In group A, 50 patients (94%) were Hindu and 3 patients were Muslim (6%) while in group B, 49 patients were Hindu (92%) while 4 were Muslim (8%).

Graph no.: 02



3. Incidence of Education

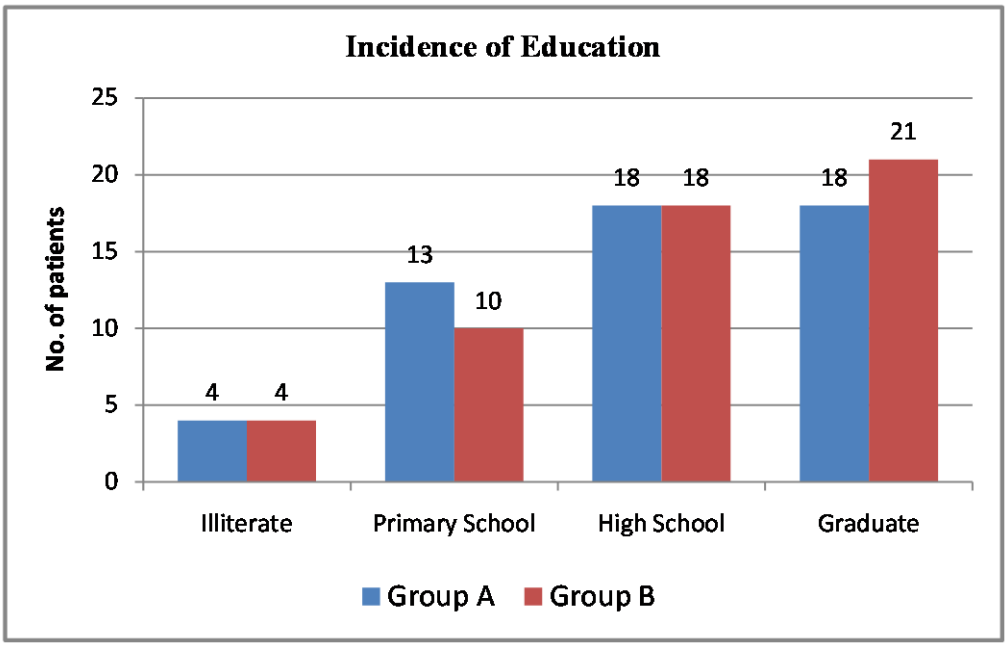
Table no.:31

Sr. No.	Education	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Illiterate	04	7.54%	04	07.54%	08	07.54%
2.	Primary School	13	25%	10	19%	23	22%
3.	High School	18	34%	18	34%	36	34%
4.	Graduate	18	34%	21	40%	39	37%

In group A, 4 patients (7.54%) were illiterate, 13 patients (25%) were educated up to primary school, and 18 were studied into high school (34%) while remaining 18 patients (34%) were graduate.

In group B, 4 patients (7.54%) were illiterate, 10 patients (19%) were educated up to primary school, and 18 were studied into high school (34%) while remaining 21 patients (40%) were graduate.

Graph no.: 03



4. Incidence of Occupation:

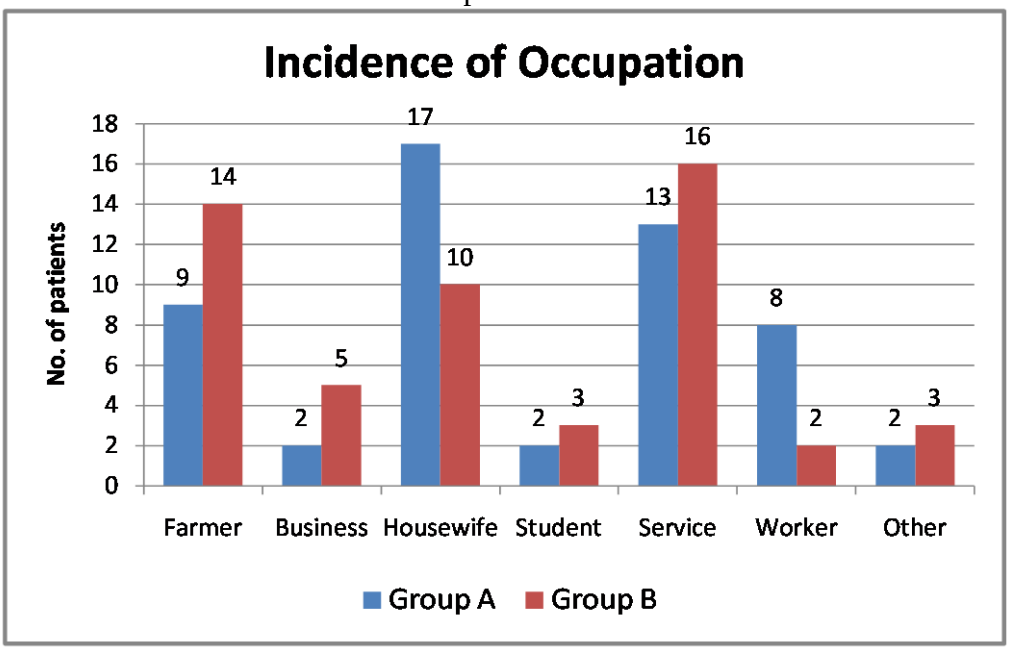
Table no.:32

Sr. No.	Occupation	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Farmer	09	17%	14	26%	23	22%
2.	Business	02	04%	05	09%	07	07%
3.	Housewife	17	32%	10	19%	27	25%
4.	Student	02	04%	03	06%	05	4.71%
5.	Service	13	25%	16	30%	29	27%
6.	Worker	08	09%	02	04%	10	09%
7.	Other	02	04%	03	06%	05	4.71%

In group A, 9 patients were farmer (17%), 2 were in business (4%), 17 patients were housewives (32%), 2 patients were student (4%), 13 patients (25%) were in service, 8 patients (9%) were workers while remaining 2 patients (4%) were in other category.

In group B, 14 patients were farmer (26%), 5 were in business (9%), 10 patients were housewives (19%), 3 patients were student (6%), 16 patients (30%) were in service, 2 patients (4%) were workers while remaining 3 patients (6%) were in other category.

Graph no.: 04



5. Incidence of Socio-economic status

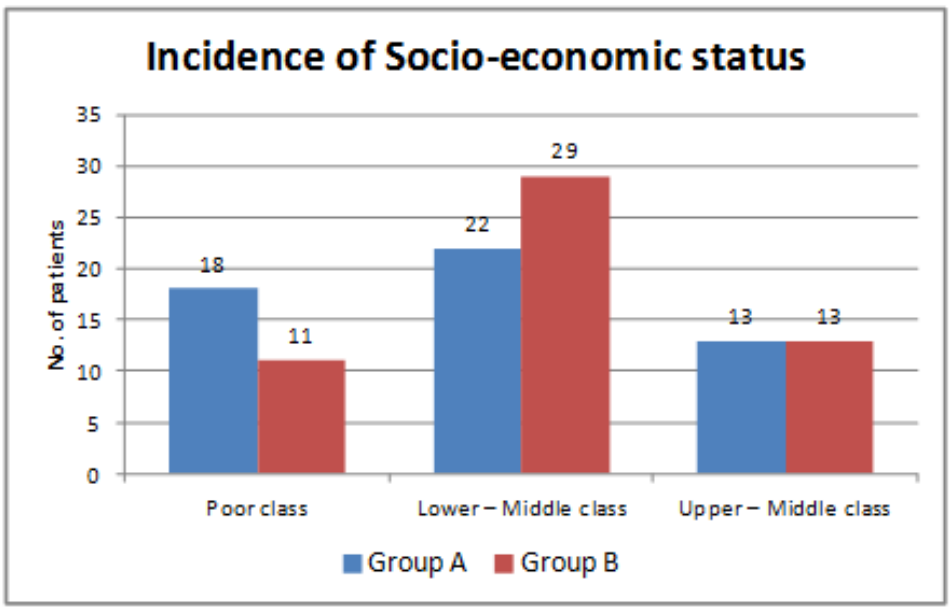
Table no.:33

Sr. No.	Socio-economic status	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Poor class	18	34%	11	20%	29	27%
2.	Lower – Middle class	22	42%	29	55%	51	48%
3.	Upper – Middle class	13	25%	13	25%	26	25%

In group A, 18 patients (34%) were from poor class, 22 patients (42%) were from lower – middle class while remaining 13 patients (25%) were from upper middle class.

In group B, 11 patients (20%) were from poor class, 29 patients (55%) were from lower – middle class while remaining 13 patients (25%) were from upper - middle class.

Graph no.: 05



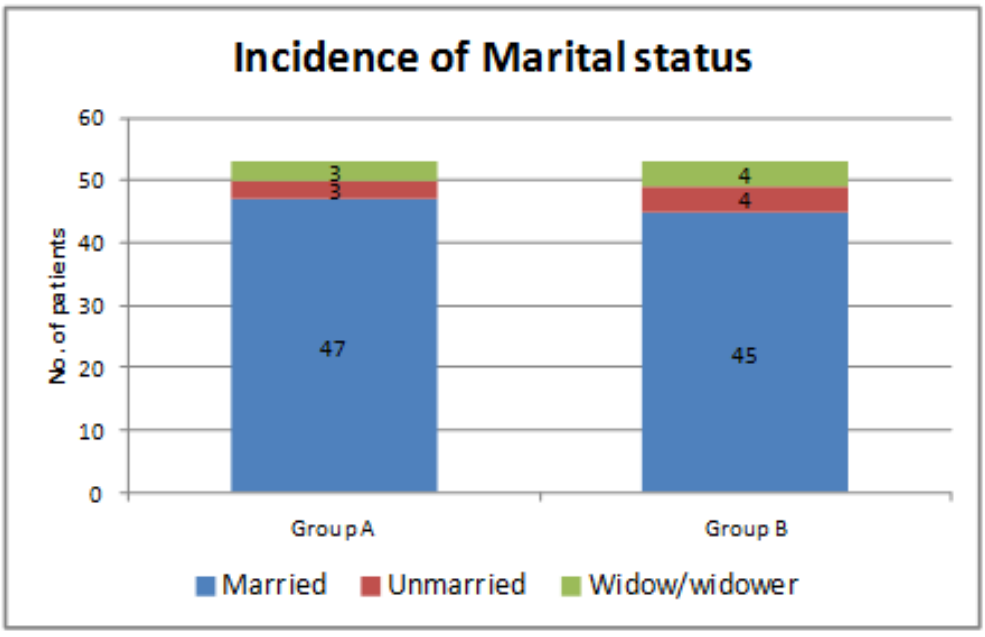
6. Incidence of Marital status

Table no.:34

Sr. No.	Marital status	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Married	47	89%	45	85%	92	87%
2.	Unmarried	03	5.5%	04	7.5%	07	6.60%
3.	Widow/widower	03	5.5%	04	7.5%	06	5.66%

In group A, 47 patients were married (89%), 3 patients were unmarried (5.5%) while 3 patients were widow/widower (5.5%). In group B, 45 patients were married (85%), 4 patients (7.5%) were unmarried while 4 patients (7.5%) were widow/widower.

Graph no.: 06



7. Incidence of onset of katishoola

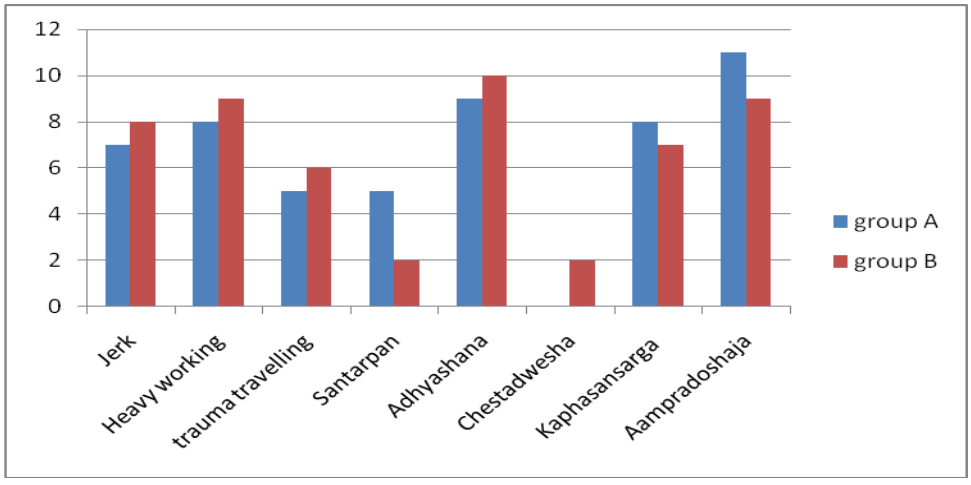
Table no.:35

Sr. No.	Causative factor for onset	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Jerk	07	13.20 %	08	15.09%	15	14.15%
2.	Heavy working	08	15.09 %	09	16.98%	17	16.03%
3.	trauma travelling	05	9.43%	06	11.32%	11	10.37%
4.	Santarpan	05	9.43%	2	3.77%	7	6.6%
5.	Adhyashana	09	16.98%	10	18.86%	19	17.92%
6.	Chestadwesha	00	00	2	3.77%	2	1.88%
7.	Kaphasansarga	08	15.09%	7	13.20%	15	14.15%
8.	Aampradoshaja	11	20.75%	9	16.98%	20	18.86%

In group A, 7 patients were causative factor jerk (13.20%), 33 patients were gradual onset (62.26%), 8 patients (15.09%) were while doing heavy working, 5(9.43%) patients were while travelling and trauma. In group B, 8 patients were causative factor jerk (15.09%), 30 patients were gradual onset (56.60%), 9 patients (16.98%) were while doing heavy working, 6(11.32%) patients were while travelling and trauma

Graph no.: 07

Onset of Katishoola



8. Incidence of Personal history

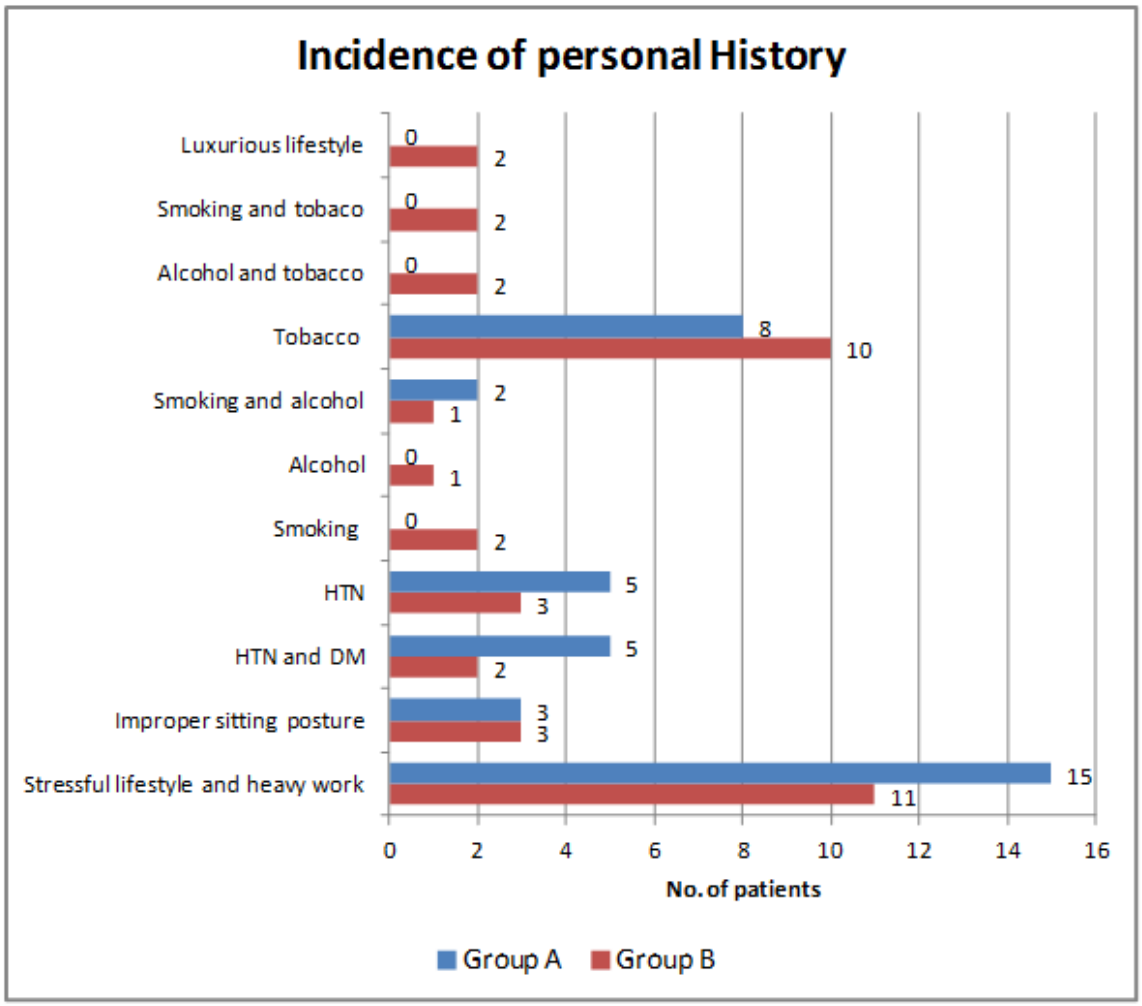
Table no.:36

Sr. No.	Personal history	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Stressful lifestyle and heavy work	15	28.30%	11	20.75%	26	24.52%
2.	Improper sitting posture	3	05.60%	3	5.66%	6	5.66%
3.	HTN and DM	5	9.43%	2	3.77%	7	6.6%
4	HTN	5	9.43%	3	5.66%	8	7.54%
5	Smoking	0	00	2	3.77%	2	1.88%
6	Alcohol	0	00	1	1.88%	1	0.94%
7	Smoking and alcohol	2	3.77%	1	1.88 %	3	2.83%
8	Tobacco	8	15.09%	10	18.86%	18	16.98%
9	Alcohol and tobacco	0	00%	2	3.77%	2	1.88%
10	Smoking and tobacco	0	00%	2	3.77%	2	1.88%
11	Luxurious lifestyle	0	00%	2	3.77%	2	1.88%

In group A 15(28.30%) patient had a history of stressful lifestyle and heavy work, 3(5.60%) had a history of improper sitting, 5(9.43 %) had a history of sufeering from htn and DM, whereas 5(9.43%) were suffering from only hypertension, 2(3.77%) patient had a history of smoking and alcohol.8(15.09%) patient had a history of tobacco chewing.

In group B 11(20.75%) patient had a history of stressful lifestyle and heavy work, 3(5.60%) had a history of improper sitting, 2(3.77 %) had a history of sufeering from htn and DM, whereas 3(5.66%) were suffering from only hypertension,2(3.77%) patient had a history of smoking, 1(1.88%) patient had a history of alcohol consumption,1(1.88%) patient had a history of smoking and alcohol.10(18.86%) patient had a history of tobacco chewing, 2(3.77%) patient had a habit of alcohol and tobacco, 2(3.77%) patient had a habit of tobacco and smoking, 2(3.77%) patient have a luxurious life style.

Graph no.: 08


Incidence of personal History
Luxurious lifestyle
Smoking and tobaco
Alcohol and tobacco
Tobacco
Smoking and alcohol
Alcohol
Smoking
HTN
HTN and DM
Improper sitting posture
Stressful lifestyle and heavy work
0
2
0
2
0
2
8
10
2
1
0
1
0
2
5
3
5
2
3
3
15
11
0
2
4
6
8
10
12
14
16
No. of patients
Group A
Group B

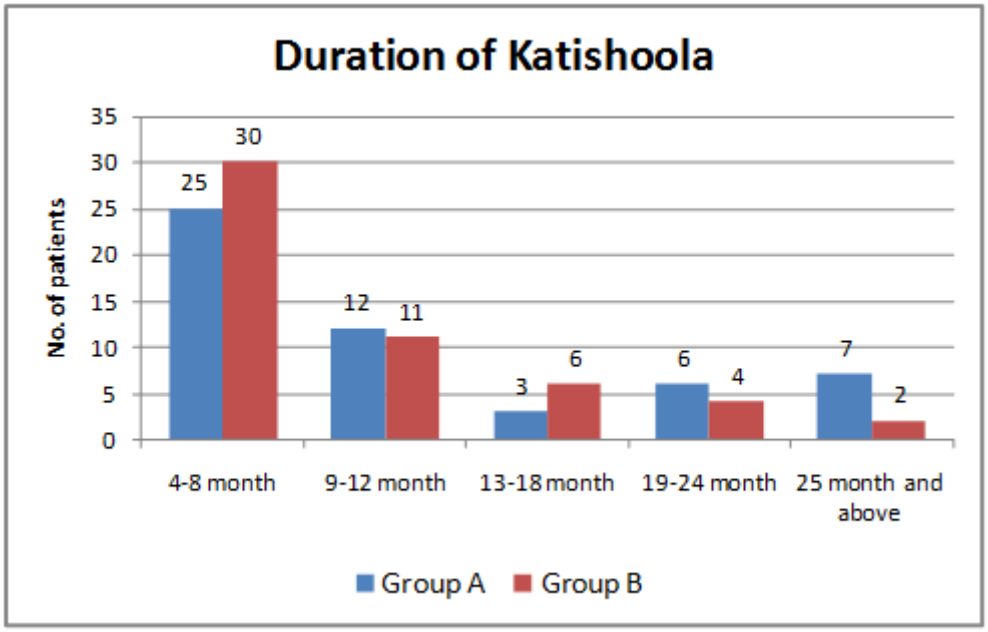
9. Incidence of Duration of katishool

Table no.:37

Sr. No.	Duration In months	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	4-8 month	25	47.16%	30	56.60%	55	51.88%
2.	9-12 month	12	22.64%	11	20.75%	23	21.69%
3.	13-18 month	3	5.66%	6	11.32%	9	8.49%
4	19-24 month	6	11.32%	4	7.54%	10	9.43%
5	25 month and above	7	13.20%	2	3.77%	9	8.49%

In concern with duration of disease in group A 25(47.16%) patient were suffering since 4-8 month, 12(22.64%) since 9-12 month, 3(5.66%) since 13-18 month, 6(11.32%) since 19-24 month and 7(13.20%) since 25 month and above. in group B 30(56.60%) patient were suffering since 4-8 month, 11(20.75%) since 9-12 month, 6(11.32%) since 13-18 month, 4(7.54%) since 19-24 month and 2(3.77%) since 25 month and above.

Graph no.: 09



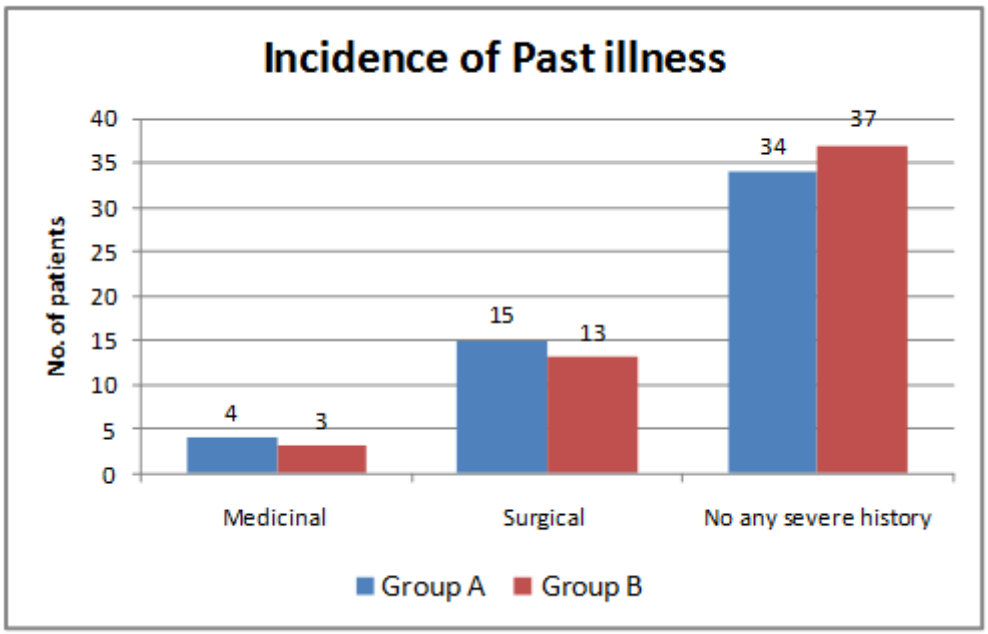
10. Incidence of past illness

Table no.:38

Sr. No.	Past illness	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Medicinal	4	7.54%	3	5.66%	7	6.60%
2.	Surgical	15	28.30%	13	24.52%	28	26.41%
3	No any severe history	34	64.15%	37	69.81%	71	66.98%

In concern with the past illness in group A 4(7.54%) patient had a medicinal history,15(28.30%) had a surgical history, 34(64.15%) patient had no any severe history. in group B 3(5.66%) patient had a medicinal history,13(24.52%) had a surgical history, 37(69.81%) patient had no any severe history.

Graph no.: 10



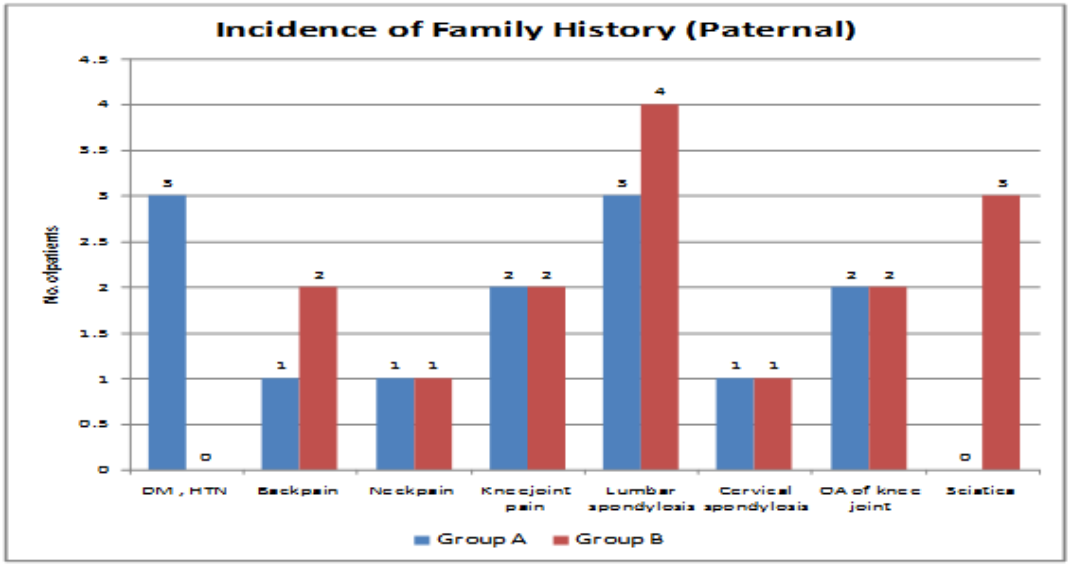
11. Incidence of family history(paternal)

Table no.:39

Sr. No.	Paternal	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	DM , HTN	3	5.66%	0	0%	3	2.83%
2.	Backpain	1	1.88%	2	3.77%	3	2.83%
3.	Neckpain	1	1.88 %	1	1.88%	2	1.88%
4	Kneejoint pain	2	3.77%	2	3.77%	4	3.77%
5	Lumbar spondylosis	3	5.66%	4	7.54%	7	6.6.%
6	Cervical spondylosis	1	1.88%	1	1.88%	2	1.88%
7	OA of knee joint	2	3.77%	2	3.77%	4	3.77%
8	Sciatica	0	0%	3	5.66%	3	2.83%

In case of paternal family history in group A 3(5.66%) patient had a history of DM and HTN, 1(1.88%) backpain, 1(1.88%) neck pain, 2(3.77%) knee joint pain, 3(5.66%) lumbar spondylosis,1(1.88%) cervical spondylosis,2(3.77%) OA of knee joint. In group B 2 (3.77%) backpain, 1(1.88%) neck pain, 2(3.77%) knee joint pain, 4(7.54%) lumbar spondylosis,1(1.88%) cervical spondylosis,2(3.77%) OA of knee joint, 3(5.66%) sciatica.

Graph no.: 11



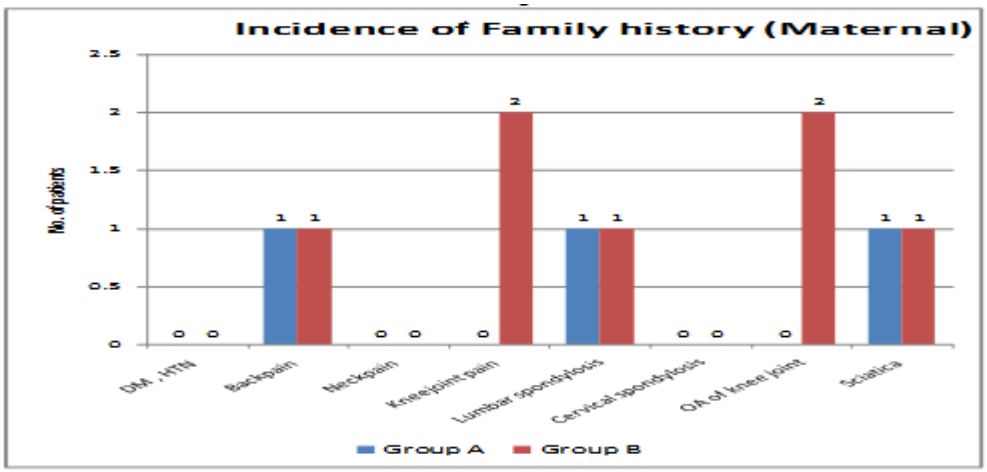
12. Incidence of family history (maternal)

Table no.:40

Sr. No.	Maternal	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	DM , HTN	0	0 %	0	0%	0	0%
2.	Backpain	1	1.88%	1	1.88%	2	1.88%
3.	Neckpain	0	0%	0	0%	0	0%
4	Kneejoint pain	0	0%	2	3.77%	2	1.88%
5	Lumbar spondylosis	1	1.88%	1	1.88%	2	1.88%
6	Cervical spondylosis	0	0%	0	0%	0	0%
7	OA of knee joint	0	0%	2	3.77%	2	1.88%
8	Sciatica	1	1.88%	1	1.88%	2	1.88%

In case of maternal family history in group A 1(1.88%) backpain, 1(1.88%), lumbar spondylosis,1(1.88%), 1(1.88%) sciatica . In group B 1(1.88%) backpain, 2(3.77%) knee joint pain, 1(1.88%) lumbar spondylosis,2(3.77%) OA of knee joint, 1(1.88%) sciatica.

Graph no.: 12



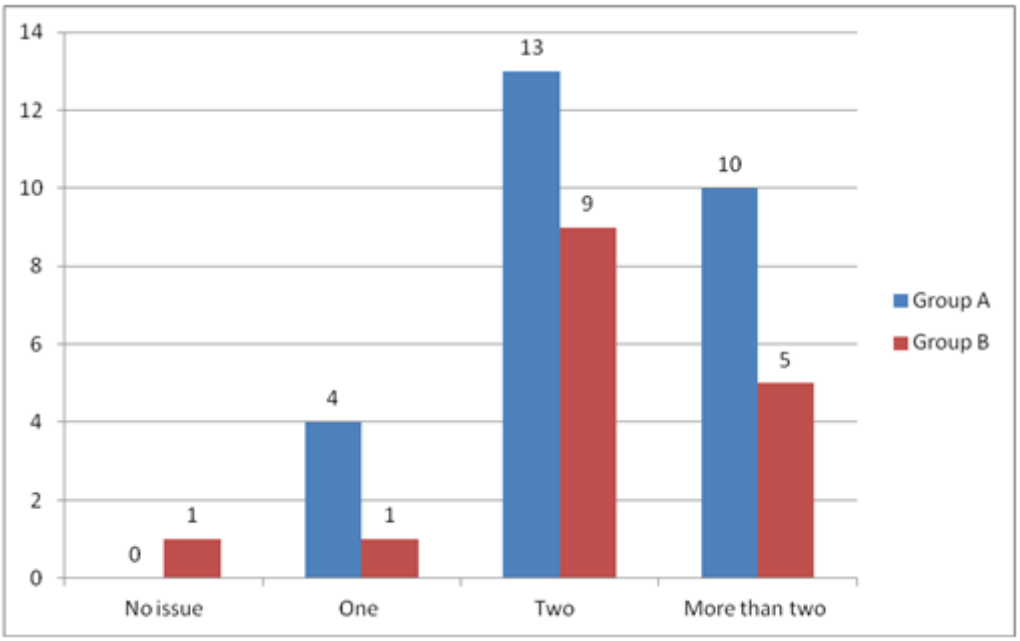
13. Incidence of obstetric history (issue)

Table no.:41

Sr. No.	Issue	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	No issue	00	0 %	01	6.25%	01	2.32%
2.	One	04	14.81%	01	6,25%	05	11.62%
3.	Two	13	48.14%	09	56.25%	22	48.88%
4.	More than two	10	37.03%	05	31.25%	15	34.88%
Total women		27	100.00%	16	100.00%	43	100.00%

In concern with the obstetric history (number of child) in group A 4(15%) women had a single issue, 13(48.14%) had a two issue and 10 (37%) had a more than two issue. in group B, 1 woman (7%) was without any child, 1(7%) women had a single issue, 9(56.25%) had a two issue and 5(33%) had a more than two issue.

Graph no.: 13



14. Incidence of obstetric history (normal/ cisserrian)

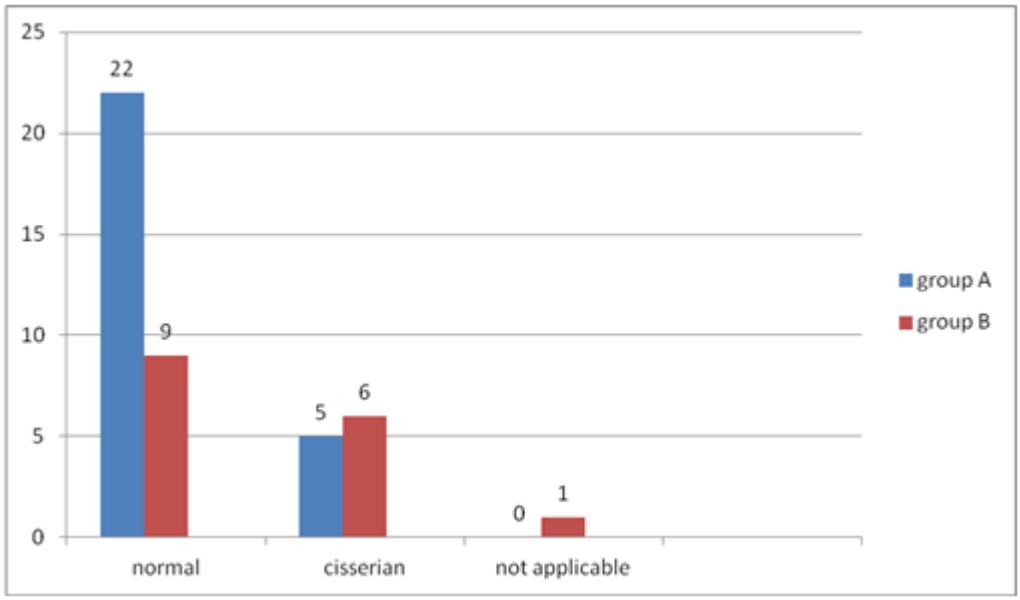
Table no.:42

Sr. No.	Causative factor for onset	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Normal	22	81%	09	56.25%	31	72.09%
2.	cisserian	05	19%	06	37.50%	11	25.58%
3.	Not applicable	00	00%	01	7%	01	2.32%
Total women		27	100.00%	16	100.00%	43	100.00%

In concern with the obstetric history (normal/cisserrian) in group A 22 (81%) women had a normal labour and 5 (19%) had a cisserian.

in group B 9 (56.257%) women had a normal labour and 6 (37.50%) had a cisserian.

Graph no.: 14



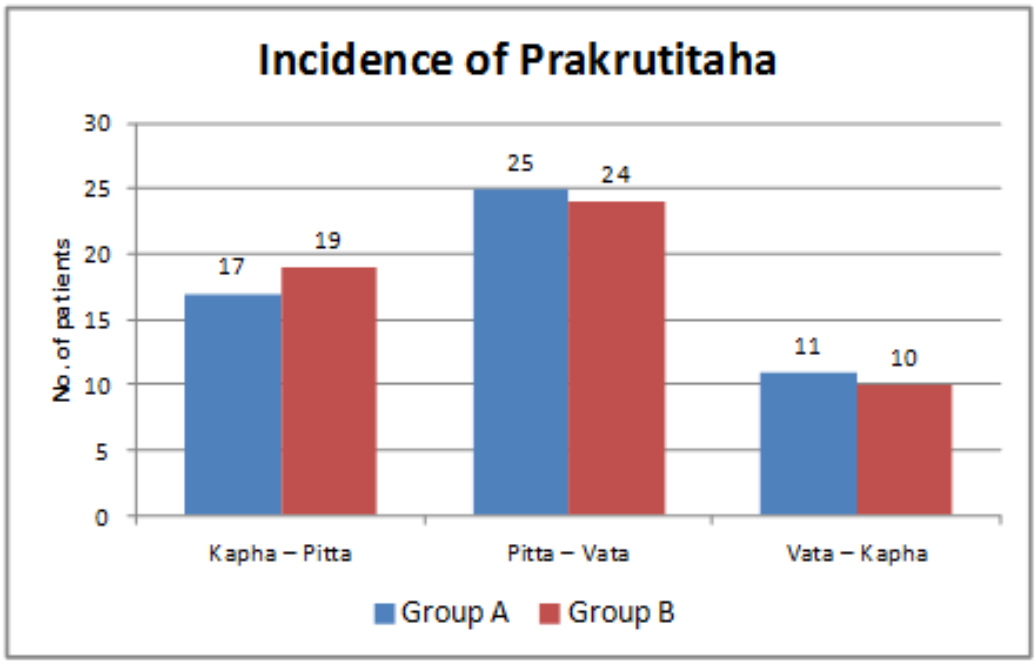
15. Incidence of Prakrititaha

Table no.:43

Sr. No.	Prakrititaha	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Kapha – Pitta	17	32.07%	19	35.84%	36	33.96%
2.	Pitta – Vata	25	47.16%	24	45.28%	49	46.22%
3.	Vata – Kapha	11	20.75%	10	18.86%	21	30.18%

For group A, there were 17 patients of Pitta – Kapha (32%), 25 patients (47.16%) of Pitta – vata, 11 patients (21%) of Vata –kapha.In group B, there were 19 patients of Kapha – Pitta (35.84%), 10 patients (19%) of Vata – kapha while 24 patients (45.28%) were of Vata – Pitta prakrititaha.

Graph no.: 15



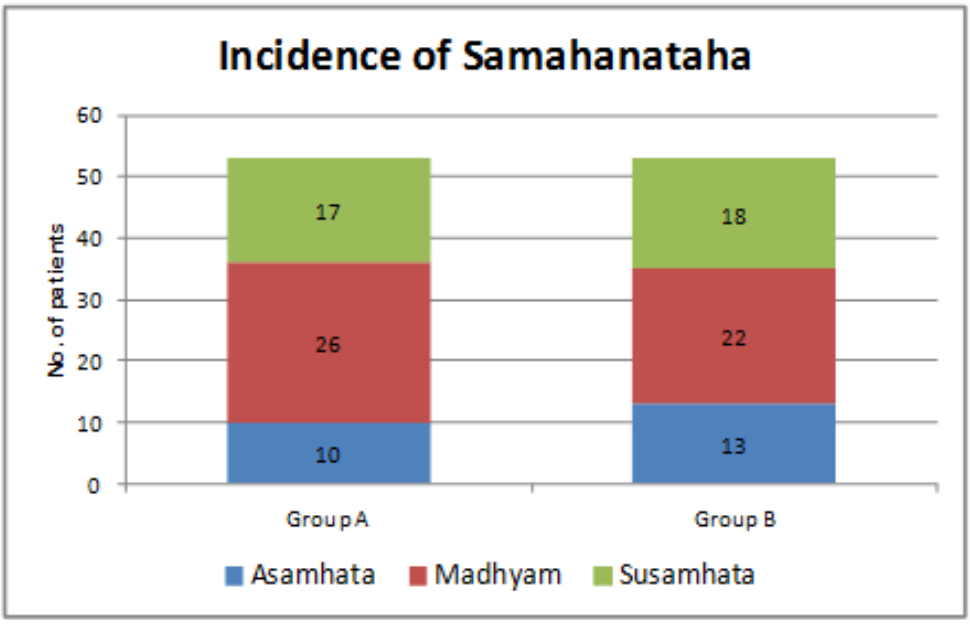
16. Incidence of Samahanataha

Table no.:44

Sr. No.	Samahanataha	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Asamhata	10	19%	13	25%	23	22%
2.	Madhyam	26	49%	22	42%	48	45%
3.	Susamhata	17	32%	18	34%	35	33%

In group A, 10 patients (19%) were of Asamhata, 26 patients were of Madhyam (49%) while 17 patients (32%) were of Susamhata. In group B, 13 patients (25%) were of Asamhata, 22 patients were of Madhyam (42%) while 18 patients (34%) were of Susamhata.

Graph no.: 16



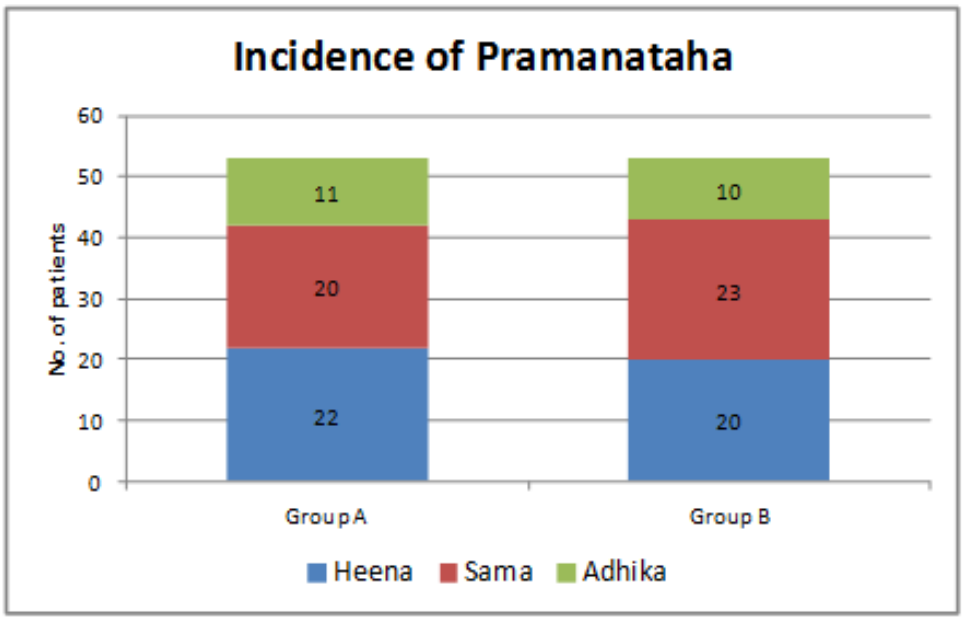
17. Incidence of Pramanataha

Table no.:45

Sr. No.	Pramanataha	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Heena	22	42%	20	38%	42	40%
2.	Sama	20	38%	23	43%	43	41%
3.	Adhika	11	21%	10	19%	21	20%

In group A, 22 patients (42%) were of Heena pramanataha, 20 patients were of sama (38%) while 11 patients (21%) were of Adhika pramanataha. In group B, 20 patients (38%) were of Heena pramanataha, 23 patients were of sama (43%) while 10 patients (19%) were of Adhika pramanataha

Graph no.: 17



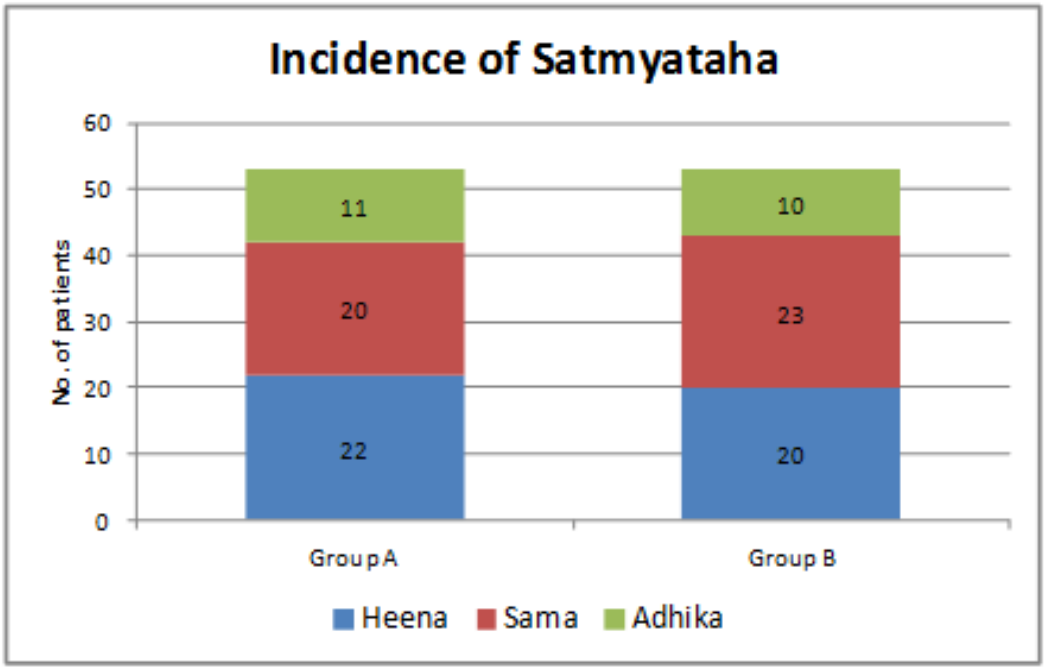
18. Incidence of Satmyataha

Table no.:46

Sr. No.	Satmyataha	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Ekrasa	11	21%	12	23%	23	22%
2.	Vyamishra	16	30%	23	43%	39	37%
3.	Sarvarasa	26	49%	18	34%	44	42%

In group A, 11 patients (21%) were of Ekrasa satmyataha, 16 patients were of Vyamishra (30%) while 26 patients (49%) were of Sarvarasa satmyataha. In group B, 12 patients (23%) were of Ekrasa satmyataha, 23 patients were of Vyamishra (43%) while 18 patients (34%) were of Sarvarasa satmyataha.

Graph no.: 18



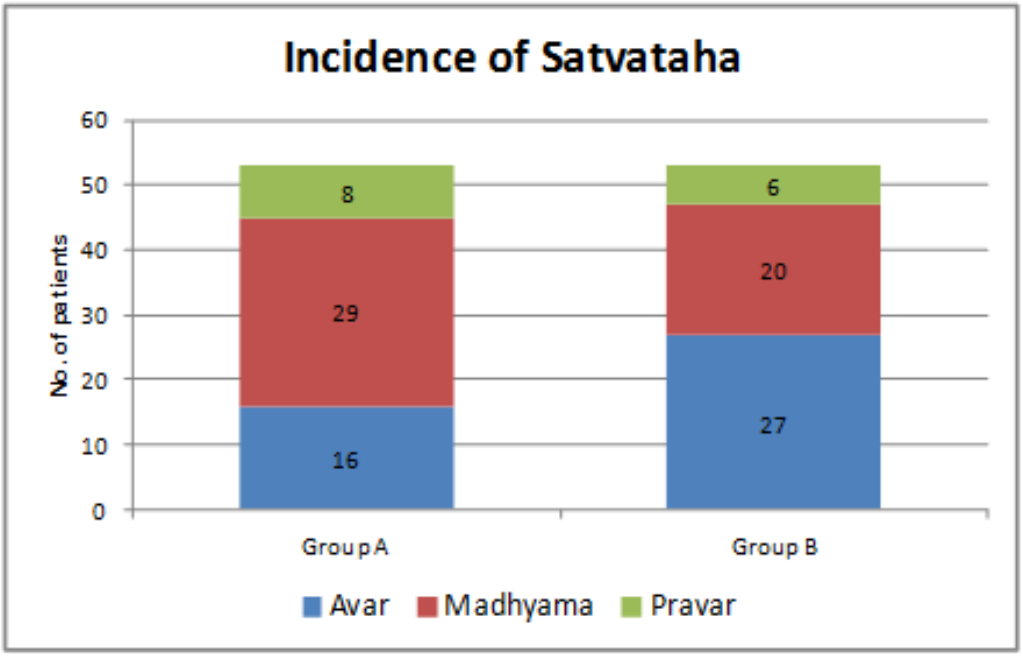
19. Incidence of Satvataha

Table no.:47

Sr. No.	Satvataha	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Avar	16	30%	27	51%	43	41%
2.	Madhyama	29	55%	20	38%	49	47%
3.	Pravar	08	15%	6	11%	14	13%

In group A, 16 patients (30%) were of Avar satvataha, 29 patients were of Madhyam (55%) while 8 patients (15%) were of Pravar satvataha. In group B, 27 patients (51%) were of Avar satvataha, 20 patients were of Madhyam (38%) while 6 patients (11%) were of Pravar satvataha.

Graph no.: 19



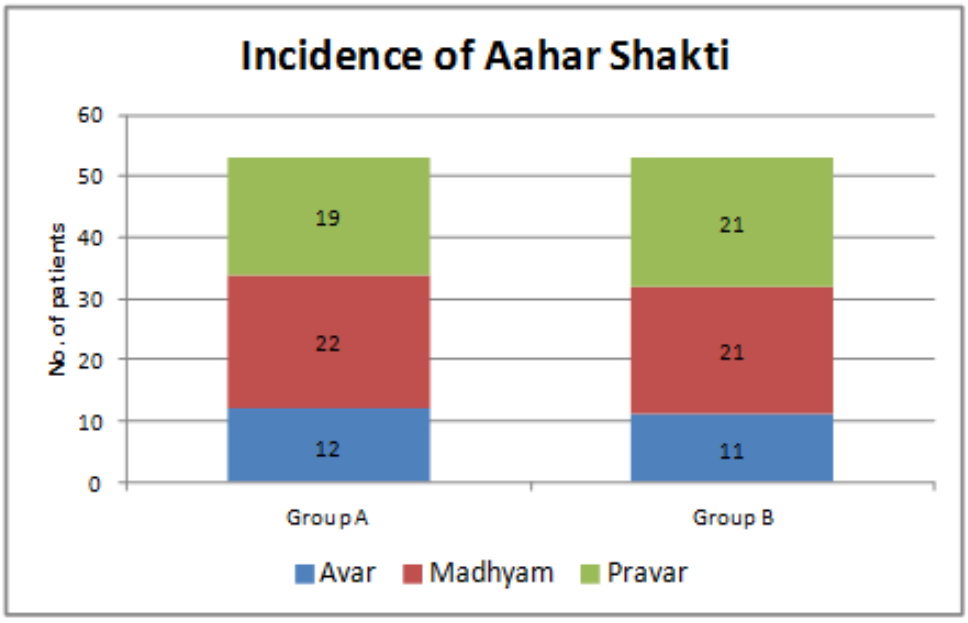
20. Incidence of Ahara Shakti

Table no.:48

Sr. No.	Ahara Shakti	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Avar	12	23%	11	21%	23	22%
2	Madhyam	22	42%	21	40%	43	41%
3.	Pravar	19	36%	21	40%	40	38%

In group A, 12 patients (23%) were of Avara Ahara Shakti, 22 patients were of Madhyam (42%) while 19 patients (36%) were of Pravar Ahara Shakti. In group B, 11 patients (21%) were of Avar Ahara Shakti, 21 patients were of Madhyam (40%) while 21 patients (40%) were of Pravar Ahara Shakti

Graph no.: 20



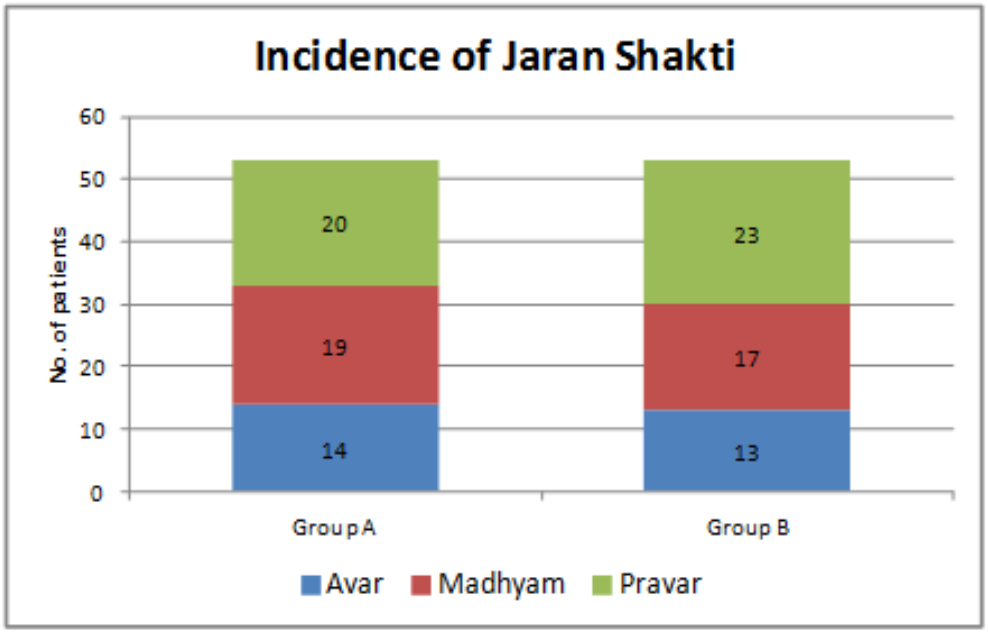
21. Incidence of Jaran Shakti

Table no.:49

Sr. No.	Jaran Shakti	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Avar	14	26%	13	25%	27	25%
2.	Madhyam	19	36%	17	32%	36	34%
3.	Pravar	20	38%	23	44%	43	41%

In group A, 14 patients (26%) were of Avara Jaran Shakti, 19 patients were of Madhyam (36%) while 20 patients (38%) were of Pravar Jaran Shakti. In group B, 13 patients (25%) were of Avar Jaran Shakti, 17 patients were of Madhyam (32%) while 23 patients (44%) were of Pravar Jaran Shakti

Graph no.: 21



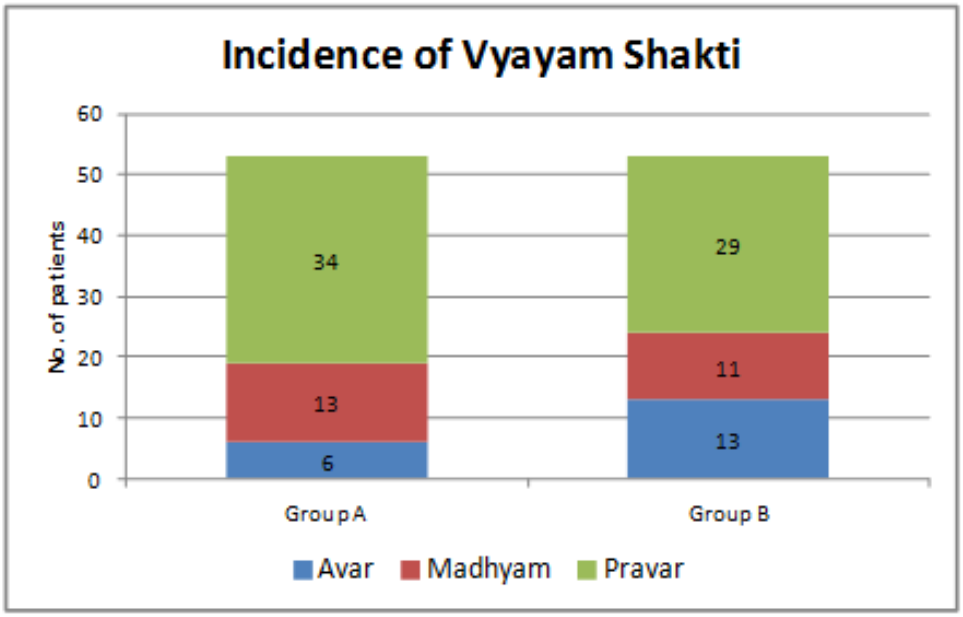
22. Incidence of Vyayam Shakti

Table no.:50

Sr. No.	Vyayam Shakti	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Avar	06	11%	13	25%	19	18%
2.	Madhyam	13	25%	11	21%	24	23%
3.	Pravar	34	64%	29	55%	63	59%

In group A, 6 patients (11%) were of Avara Vyayam Shakti, 13 patients were of Madhyam (25%) while 34 patients (64%) were of Pravar Vyayam Shakti. In group B, 13 patients (25%) were of Avar Vyayam Shakti, 11 patients were of Madhyam (21%) while 29 patients (55%) were of Pravar Vyayam Shakti.

Graph no.: 22



23. Incidence of lumbar lordosis

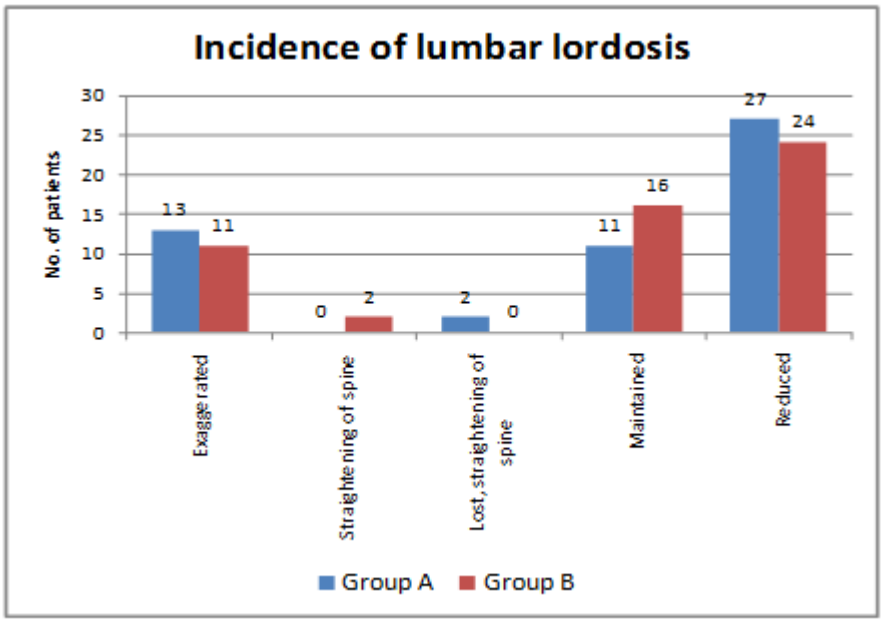
Table no.:51

Sr. No.	Lumbar lordosis	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Exaggerated	13	25%	11	21%	24	23%
2.	Straightening of spine	02	04%	02	04%	04	03.77%
3.	Maintained	11	21%	16	30%	27	25%
4.	Reduced	27	51%	24	45%	51	48%

In group A, 13 patients (25%) were having exaggerated, 2 patients (4%) were having straightening of spine, 11 patients (21%) were having maintained while remaining 27 patients (51%) were with reduced normal lumbar lordosis.

In group B, 11 patients (21%) were having exaggerated, 2 patients (4%) were having straightening of spine, 16 patients (30%) were having maintained while remaining 24 patients (45%) were with reduced normal lumbar lordosis.

Graph no.: 23



24. Incidence of Bone mineralization

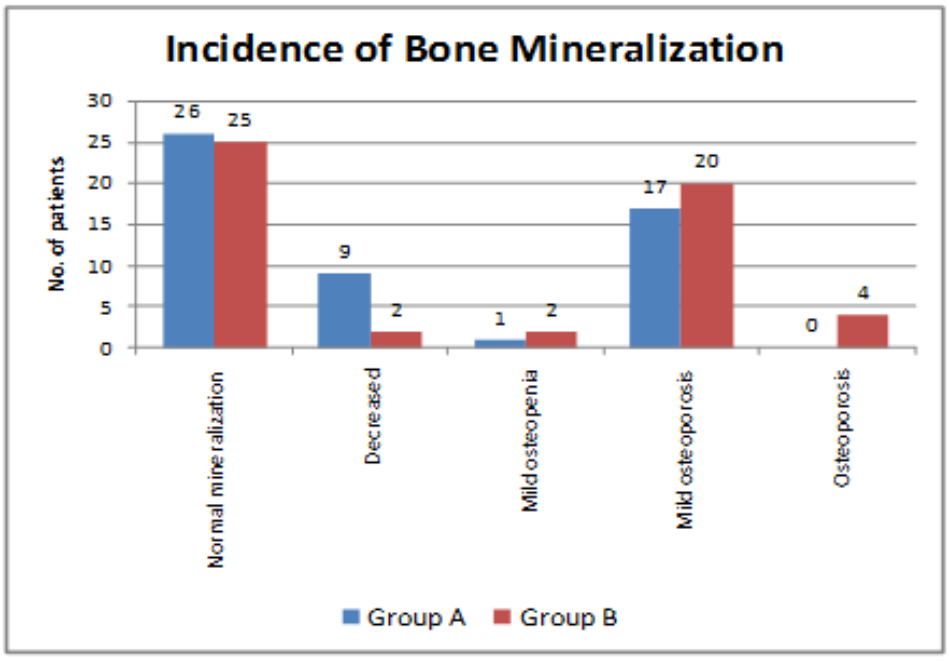
Table no.:52

Sr. No.	Bone mineralization	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Normal mineralization	26	49%	25	47%	51	48%
2.	Decreased	09	17%	02	04%	11	10%
3.	Mild osteopenia	01	02%	02	04%	03	03%
4.	Mild osteoporosis	17	32%	20	38%	37	35%
5.	Osteoporosis	00	00%	04	08%	04	04%

In group A, 26 patients (49%) were having normal mineralizaton, 9 patients (17%) were having decreased bone mineralization, 1 patient (2%) was with mild osteopenia and remaining 17 patients (32%) were with Mild osteoporosis.

In group B, 25 patients (47%) were having normal mineralizaton, 2 patients (4%) were having decreased bone mineralization, 2 patients (4%) were with mild osteopenia, 20 patients (38%) were with Mild osteoporosis and remaining 4 patients (8%) were having osteoporosis.

Graph no.: 24



25. Incidence of Disc space

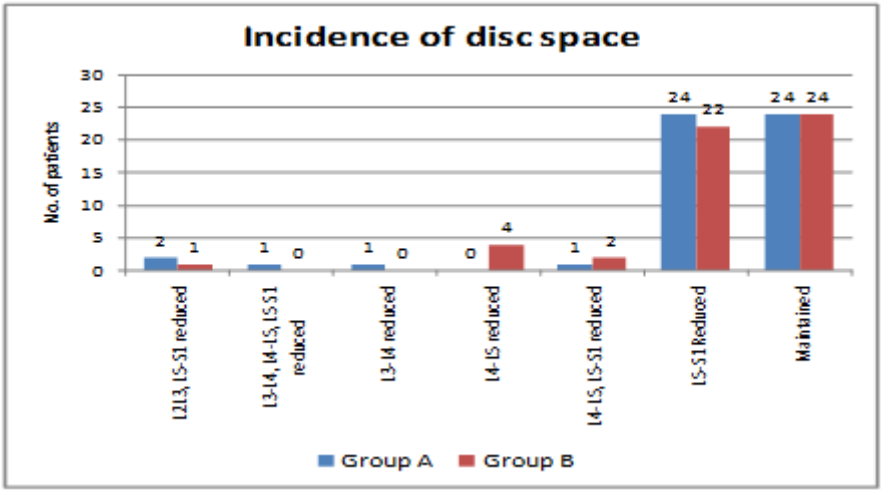
Table no.:53

Sr. No.	Disc space	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	L2L3, L5-S1 reduced	02	04%	01	02%	03	03%
2.	L3-L4, L4-L5, L5 S1 reduced	01	02%	00	00%	01	01%
3.	L3-L4 reduced	01	02%	00	00%	01	01%
4.	L4-L5 reduced	00	00%	04	08%	04	04%
5.	L4-L5, L5-S1 reduced	01	02%	02	04%	03	03%
6.	L5-S1 Reduced	24	45%	22	41%	46	43%
7.	Maintained	24	45%	24	45%	48	45%

In group A, L2L3, L5-S1 disc space was reduced in 2 patients (4%), L3-L4, L4-L5, L5 S1 reduced in 1 patient (2%), L3-L4 disc space was reduced in 1 patient (2%), L4-L5, L5-S1 reduced in 1 patient (2%), 24 patient (45%) were having L5-S1 disc space reduction while remaining 24 patients (45%) were having maintained disc space.

In group B, L2L3, L5-S1 disc space was reduced in 1 patient (2%), L4-L5 disc space was reduced in 4 patients (8%), L4-L5, L5-S1 reduced in 2 patients (4%), 22 patients (41%) were having L5-S1 disc space reduction while remaining 24 patients (45%) were having maintained disc space.

Graph no.: 25



26. Incidence of Facetal arthropathy

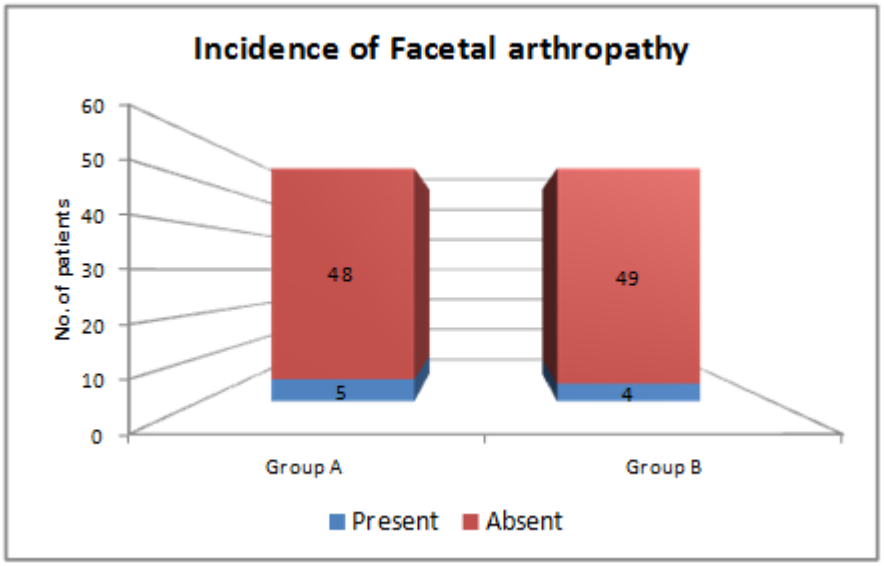
Table no.:54

Sr. No.	Facetal arthropathy	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Present	05	09%	04	08%	09	08%
2.	Absent	48	91%	49	92%	97	92%

In group A, there were 5 patients (9%) with Facetal arthropathy present while for 48 patients (91%) it was absent.

In group B, facetal arthropathy was present in 4 patients (8%) while for remaining 49 patients (92%) it was absent.

Graph no.: 26



27. Incidence of Degenerative osteophytic outgrowth

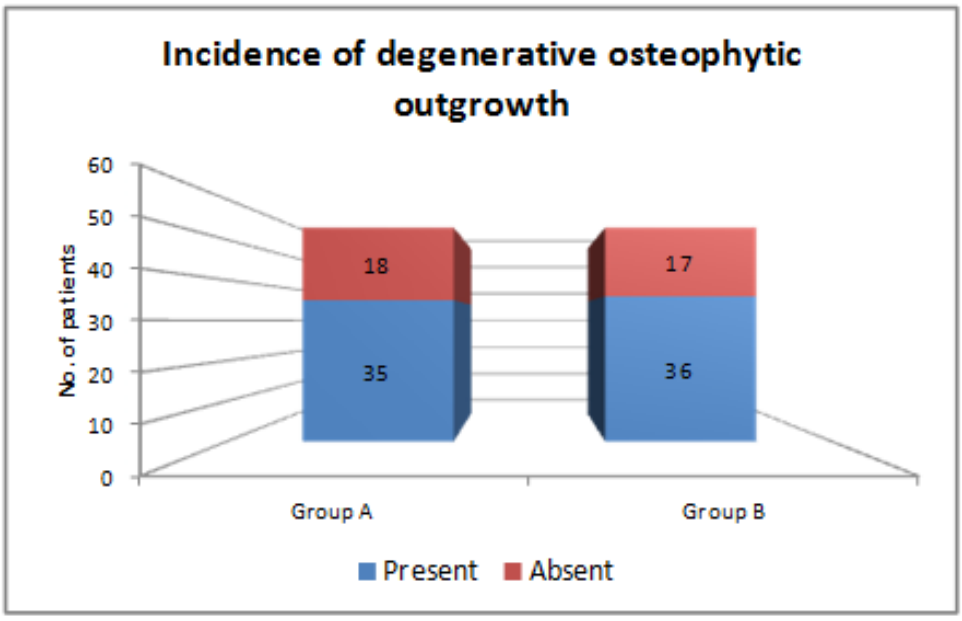
Table no.:55

Sr. No.	Degenerative osteophytic outgrowth	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Present	35	66%	36	68%	71	67%
2.	Absent	18	34%	17	32%	35	33%

In group A, degenerative osteophytic outgrowth was observed in 35 patients (66%) while in remaining 18 patients (34%) it was absent.

In group B, degenerative osteophytic outgrowth was observed in 36 patients (68%) while in remaining 17 patients (32%) it was absent.

Graph no.: 27



28. Incidence of Bony lumbar canal

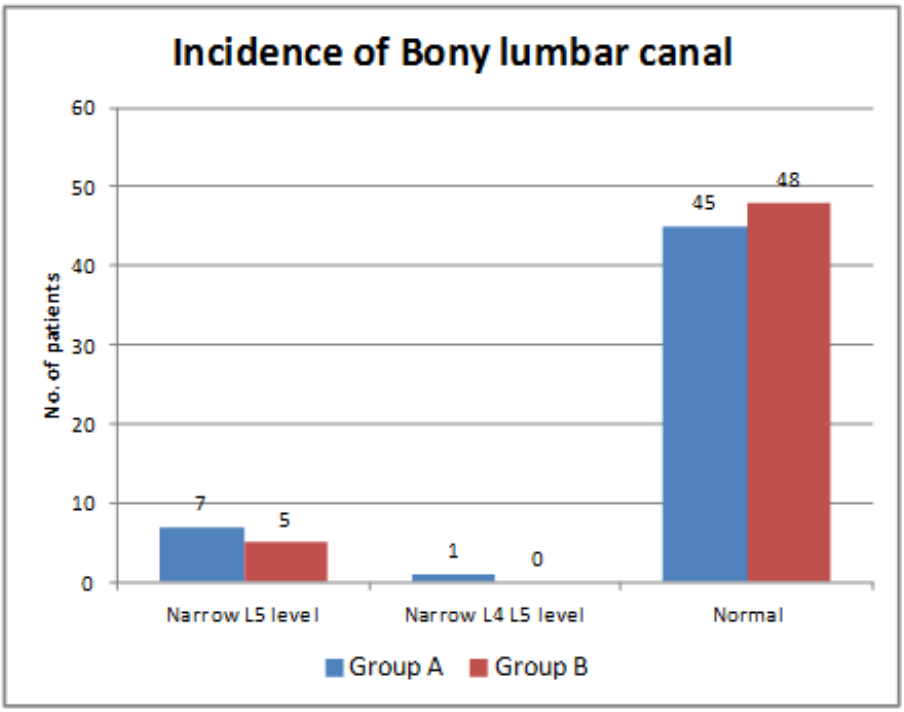
Table no.:56

Sr. No.	Bony lumbar canal	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Narrow L5 level	07	13%	05	09%	12	11%
2.	Narrow L4 L5 level	01	1.88%	00	00%	01	0.94%
3.	Normal	45	85%	48	91%	93	88%

In group A, 7 patients (13%) were having narrow L5 level bony lumbar canal, 1 patient (1.88%) was with narrow L4 L5 level while 45 patients (85%) were with normal Bony lumbar canal.

In group B, 5 patients (9%) were having narrow L5 level bony lumbar canal while 48 patients (91%) were with normal Bony lumbar canal.

Graph no.: 28



29. Incidence of Vertebral bodies and pedicles –

All the 106 patients from both group A and group B were with intact vertebral bodies and pedicles.

30. Incidence of SI joint

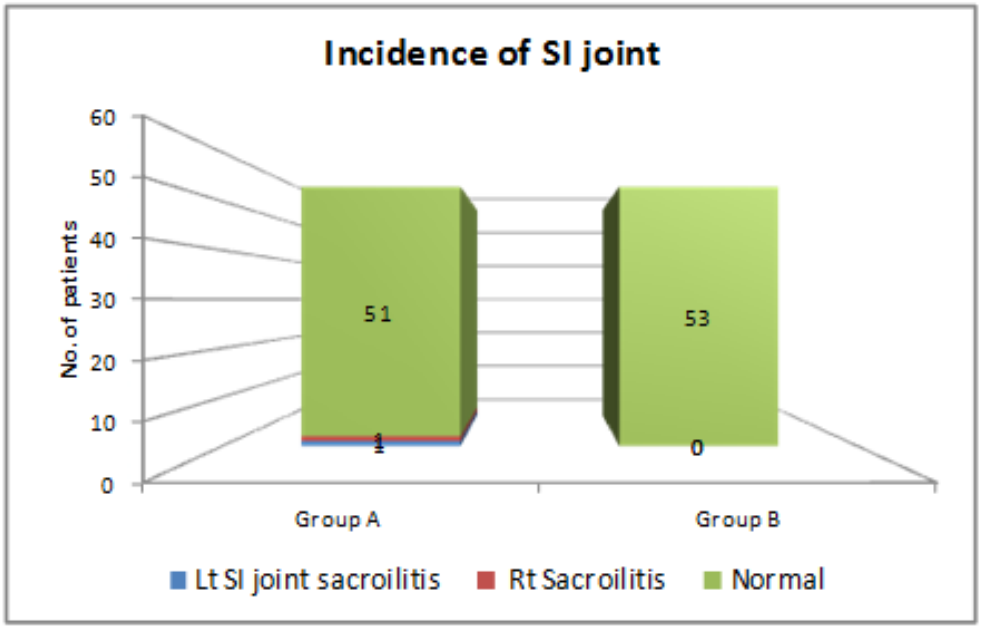
Table no.:57

Sr. No.	SI joint	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Lt SI joint sacroilitis	01	1.88%	00	00%	01	00.94%
2.	Rt Sacroilitis	01	1.88%	00	00%	01	01%
3.	Normal	51	96%	53	100%	104	98%

In group A, there were 1 patients (1.88%) with rt SI joint sacroilitis and were 1 patients (1.88%) with left SI joint sacroilitis present while for 51 patients (96%) it was normal.

In group B, All the 53 patients with normal SI joint.

Graph no.: 29



31. Incidence of BMI:

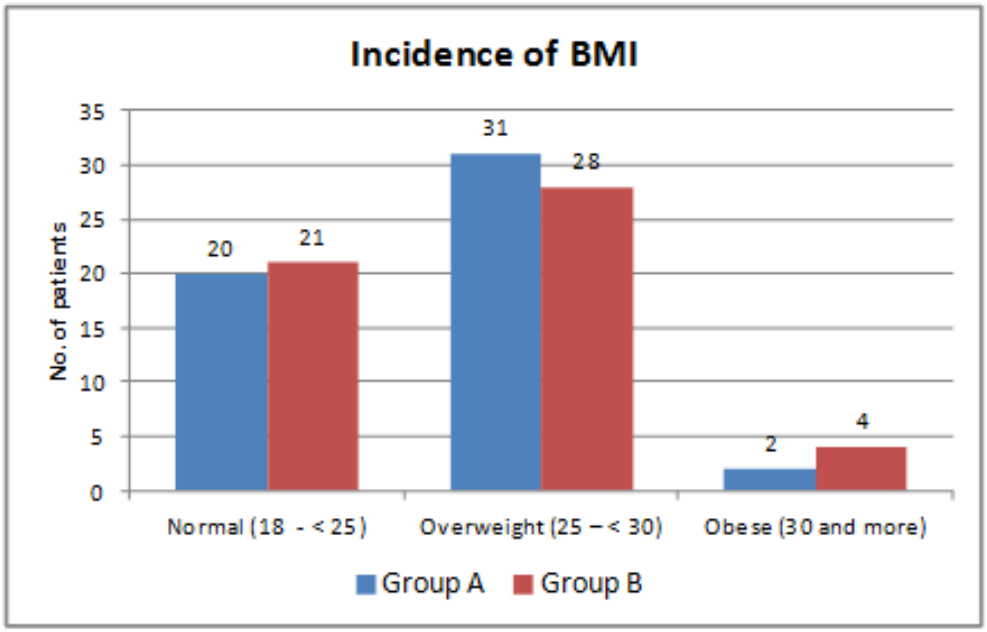
Table no.:58

Sr. No.	BMI	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	Normal (18 - < 25)	20	37.74%	21	39.62%	41	38.67%
2.	Overweight (25 – < 30)	31	58.49%	28	52.83%	59	55.66%
3.	Obese (30 and more)	2	03.77%	04	07.55%	06	05.66%

In group A, 20 patients (38%) were with normal BMI, 31 patients (58%) were overweighed while 2 patients (4%) were obese according to BMI.

In group B, 21 patients (40%) were with normal BMI, 28 patients (53%) were overweighed while 4 patients (8%) were obese as assessed with BMI.

Graph no.: 30



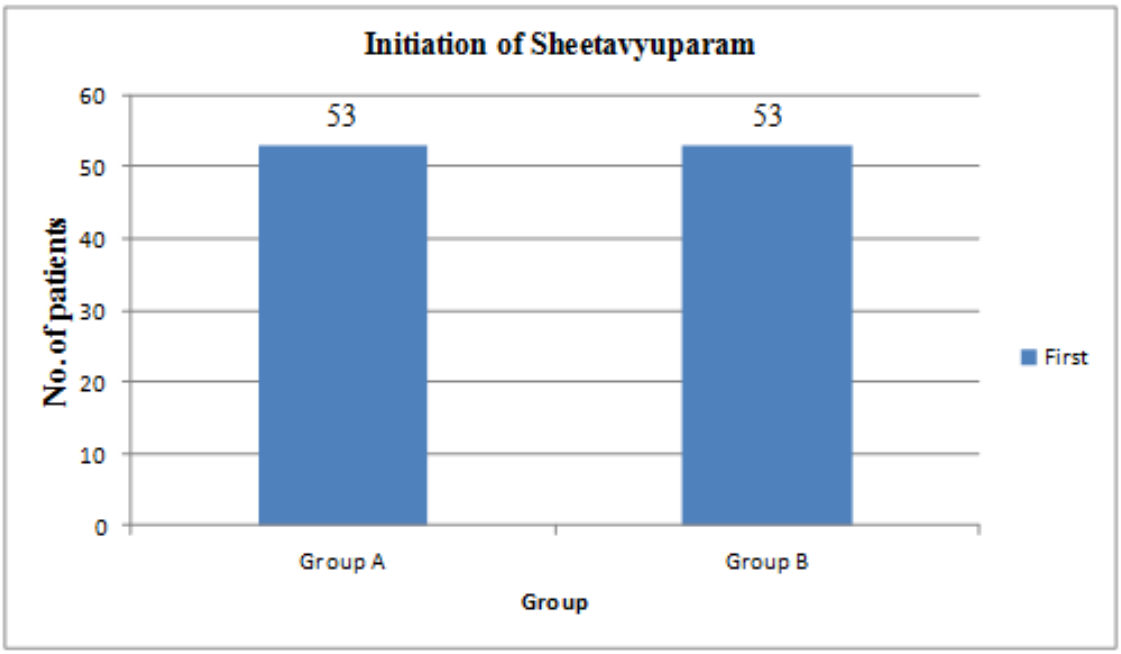
32. Incidence of sheetavyuparam (coldness of area)

Table no.:59

Incidence of sheetavyuparam was observed from first day in both the group among all the patients.

Sr. No.	Day of the initiation of laxana	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	First	53	100%	53	100%	106	100%

Graph no.: 31



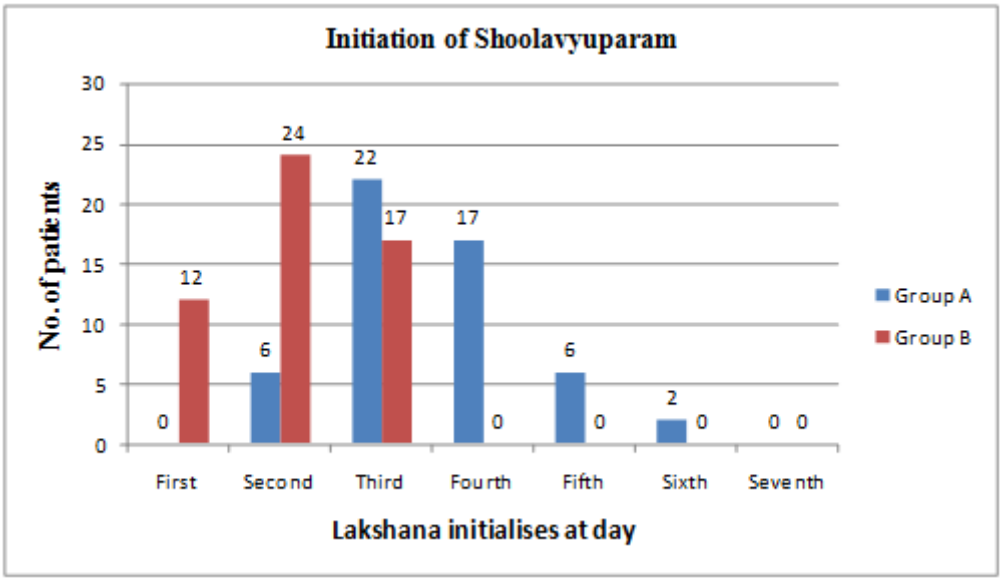
33. Incidence of shoolavyuparama

Table no.:60

Sr. No.	Day of the initiation of laxana	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	First	0	0%	12	22.64%	12	11.32%
2.	Second	6	11.32%	24	45.28%	30	28.30%
3.	Third	22	41.50%	17	32.07%	39	36.79%
4.	Fourth	17	32.07%	00	0%	17	16.03%
5	Fifth	6	11.32%	00	0%	6	5.66%
6	Sixth	2	3.77%	00	0%	2	1.88%
7	Seventh	0	0%	00	0%	0	0%

Among all the patients the shoolavyuparama has been observed in group A as 6 patients (11.32%) from second day onwards, 22 patients (41.50%) from third day onwards, 17 patients (32.07%) from fourth day onwards, 6 patients (11.32%) from fifth day onwards, 2 patients (3.77%) from sixth day onwards. In group B as 12 patients (22.64%) patients from first day onwards, 24 patients (45.28%) from second day onwards,17 patients (32.07%) from third dayonwards.

Graph no.: 32



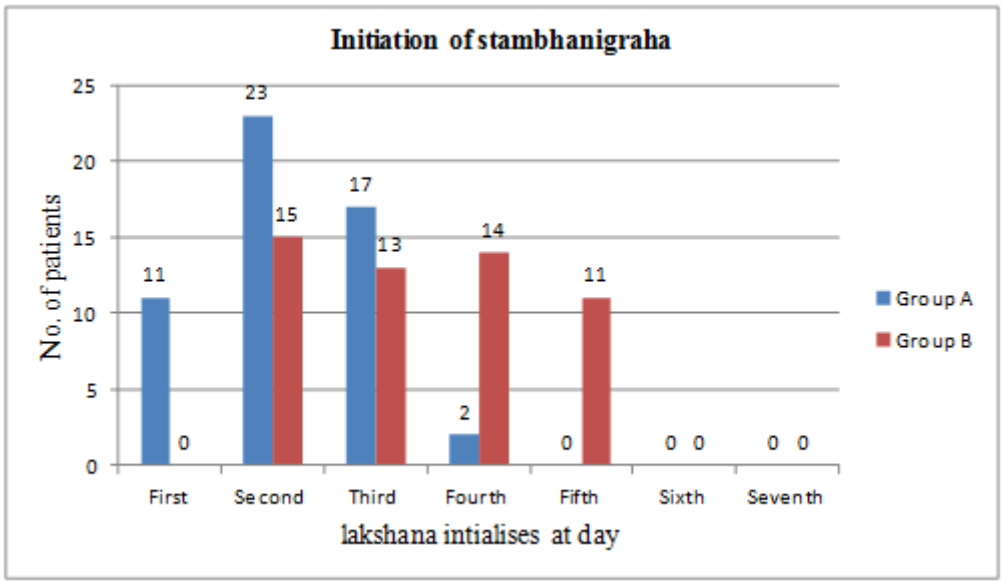
34. Incidence of stambhanigraha

Table no.:61

Sr. No.	Day of the initiation of laxana	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	First	11	20.75%	00	00%	11	10.37%
2.	Second	23	43.39%	15	28.30%	38	35.84%
3.	Third	17	32.07%	13	24.52%	30	28.30%
4.	Fourth	02	3.77%	14	26.41%	16	15.09%
5	Fifth	00	0%	11	20.75%	11	10.37%
6	Sixth	00	0%	00	00%	00	0%
7	Seventh	00	0%	00	00%	00	0%

Among all the patients stambhanigraha has been observed in group A as 11 patients (20.75%) from first day onwards, 23 patients (43.39%) from second day onwards, 17 patients (32.07%) from third day onwards, 02 patients (3.77%) from fourth day onwards. In group B as 15 patients (28.30%) from second day onwards, 13 patients (24.52%) from third day onwards, 14 patients (26.41%) from fourth day onwards, 11 patients (20.75%) from fifth day onwards.

Graph no.: 33



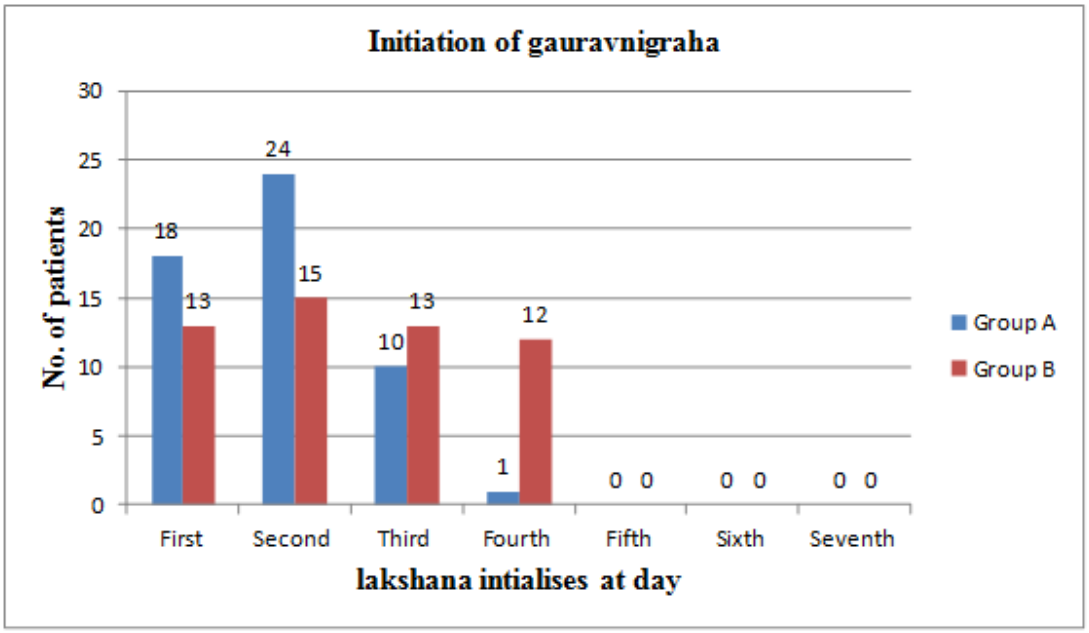
35. Incidence of gouravanigraha

Table no.:62

Sr. No.	Day of the initiation of laxana	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	First	18	41.86%	13	24.52%	31	29.24%
2.	Second	24	45.28%	15	28.30%	39	36.79%
3.	Third	10	18.86%	13	24.52%	23	21.69%
4.	Fourth	01	1.88%	12	22.64%	13	12.26%
5	Fifth	00	0%	00	0%	00	0%
6	Sixth	00	0%	00	0%	00	0%
7	Seventh	00	0%	00	0%	00	0%

Among all the patients, gouravanigraha has been observed in group A as 18 patients (41.86%) from first day onwards, 24 patients (45.28%) from second day onwards, 10 patients (18.86%) from third day onwards, 01 patient (1.88%) from fourth day onwards. In group B as 13 patients (24.52%)from first day onwards,15 patients (28.30%) from second day onwards,13 patients (24.52%) from third day onwards, 12 patients (22.64%) from fourth day onwards.

Graph no.: 34



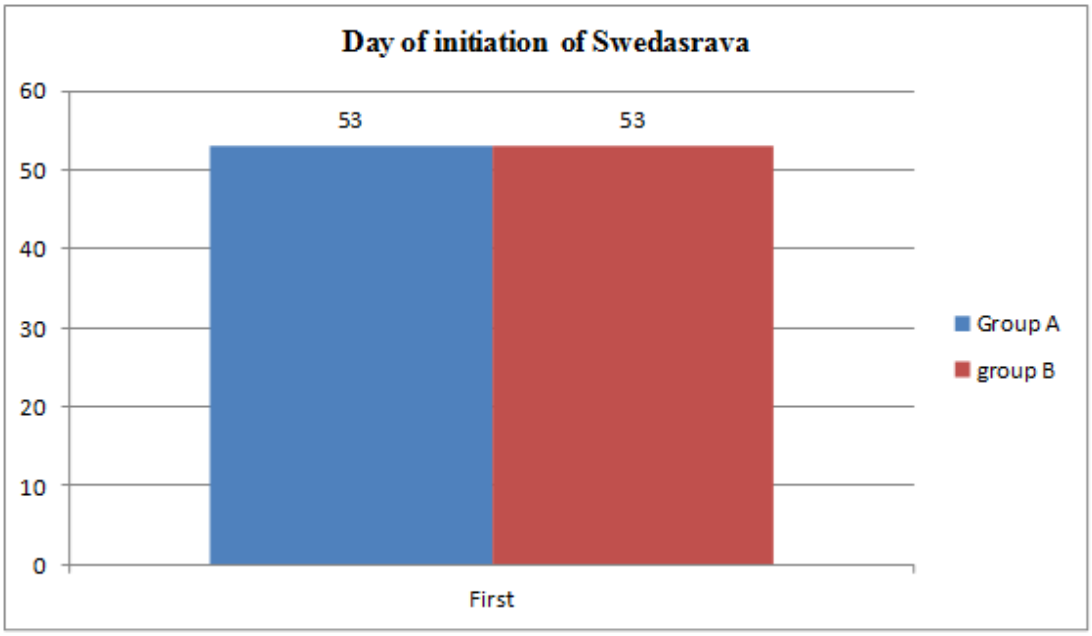
36. Incidence of swedasrava:

Table no.:63

Sr. No.	Day of the initiation of laxana	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	First	53	100%	53	100%	106	100%

Incidence of swedasrava was observed from first day in both the group among all the patients.

Graph no.: 35



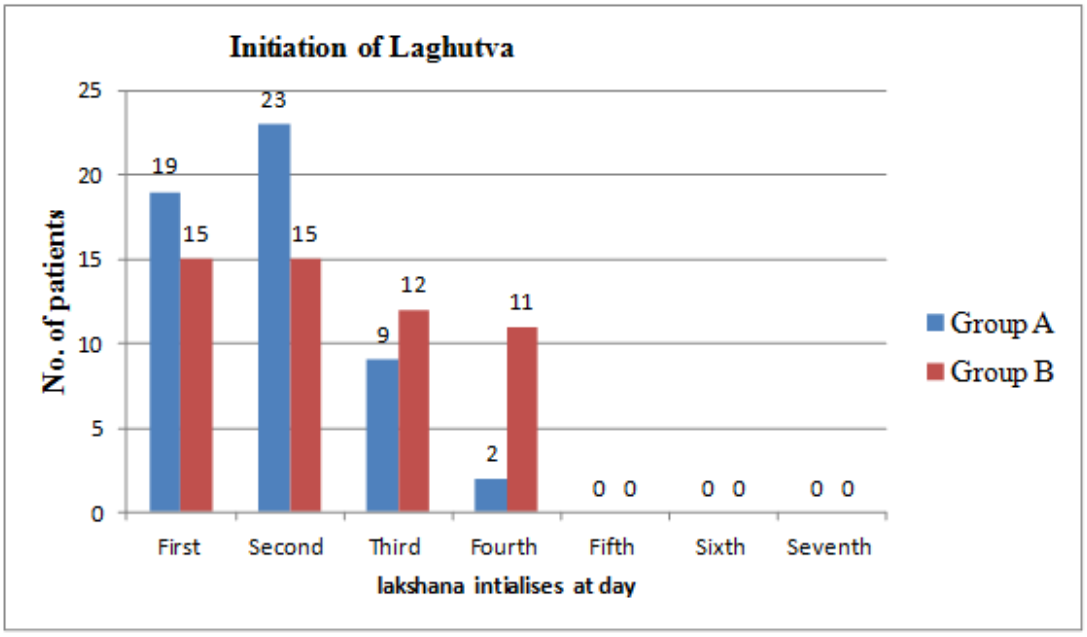
37. Incidence of laghutva

Table no.:64

Sr. No.	Day of the initiation of laxana	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	First	19	35.84%	15	28.3%	34	32.07%
2.	Second	23	43.39%	15	28.3%	38	35.84%
3.	Third	9	16.98%	12	22.6%	21	19.81%
4.	Fourth	2	3.77%	11	20.75%	13	12.26%
5	Fifth	0	0%	0	0%	00	0%
6	Sixth	0	0%	0	0%	00	0%
7	Seventh	0	0%	0	0%	00	0%

Among all the patients laghutva has been observed in group A as 19 patients (35.84%) from first day onwards, 23 patients (43.39%) from second day onwards, 9 patients (16.98%) from third day onwards, 02 patients (3.77%) from fourth day onwards. In group B as 15 patients (28.30%)from first day onwards,15 patients (28.30%) from second day onwards,12 patients (22.6%) from third day onwards, 11 patients (20.75%) from fourth day onwards.

Graph no.: 36



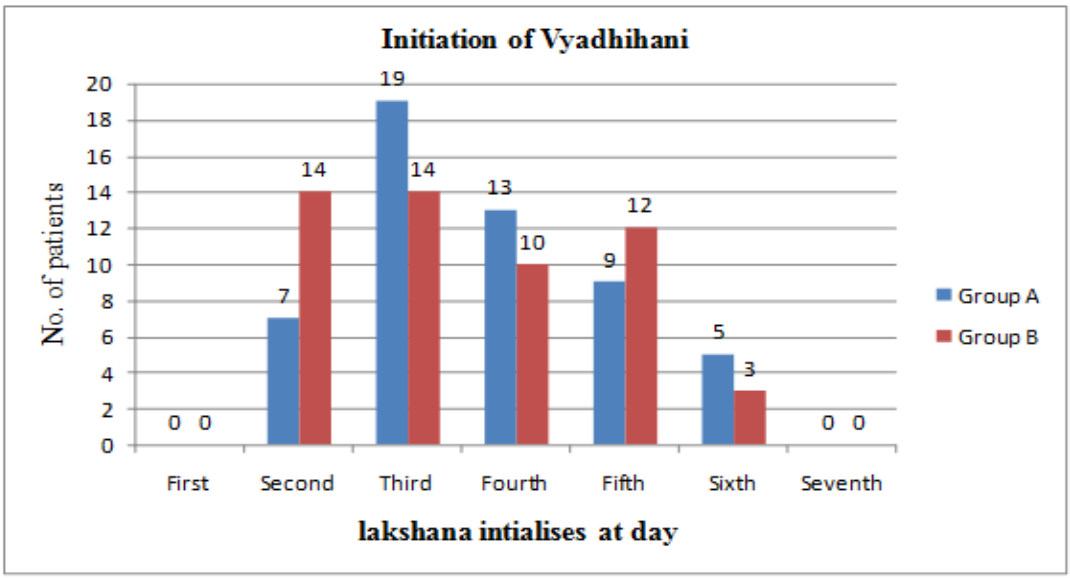
38. Incidence of vyadhihani

Table no.:65

Sr. No.	Day of the initiation of laxana	Group A		Group B		Total	
		Count	%	Count	%	Count	%
1.	First	00	0%	00	0%	00	0%
2.	Second	7	13.2%	14	26.41%	21	19.81%
3.	Third	19	35.84%	14	26.41%	33	31.13%
4.	Fourth	13	24.52%	10	18.86%	23	21.70%
5	Fifth	9	16.98%	12	22.64%	21	19.81%
6	Sixth	5	9.43%	03	5.66%	8	7.54%
7	Seventh	00	0%	00	0%	00	0%

Among all the patients vyadhihani has been observed in group A as 7 patients (13.2%) from second day onwards, 19 patients (35.84%) from third day onwards, 13 patients (24.52%) from fourth day onwards,9 patients (16.98%) fifth day onwards, 5 patients (9.43%) from sixth day onwards. In group B as 14 patients (26.41%) from second day onwards,14 patients (26.41%) from third day onwards, 10 patients (18.86%) from fourth day onwards,12 patients (22.64%) from fifth day onwards, 3 patients (5.66%) from sixth day onwards.

Graph no.: 37



Observation on sign of diagnostic criteria

Katishool: oswestry low back pain score.

Stambha: schobers test.

Kriyahani : lateral flexion, Flexion, Rotation

Sparshasahatva : Tenderness

Distribution of Oswestry score:

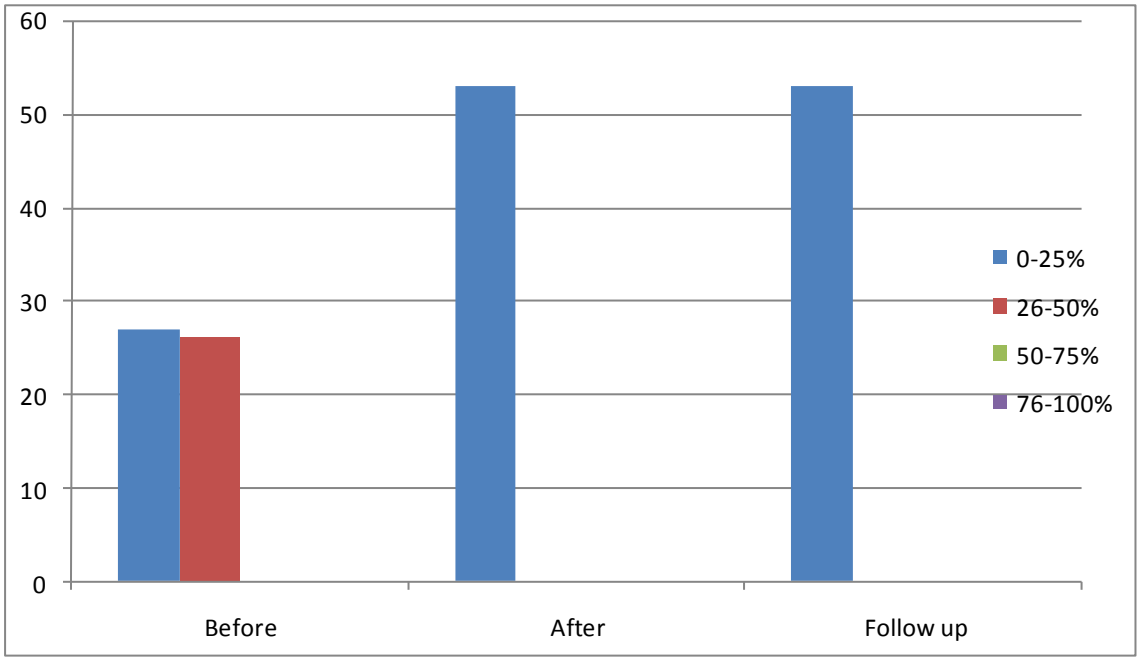
Table no.: 66

Interpretation	Score	Group A			Group B		
		Before (%)	After (%)	Followup (%)	Before (%)	After (%)	Followup (%)
Minimal	Upto 25%	27 (50.94 %)	53(100 %)	53 (100%)	16 (30.18 %)	53 (100%)	53 (100%)
Moderate	26-50%	26 (49.06 %)	00	00	36 (67.92 %)	00	00
Severe	51-75%	00	00	00	1 (1.88%)	00	00
Crippled	76% and above	00	00	00	00	00	00
Total	Count	53	53	53	53	53	53
	%	100%	100%	100%	100%	100%	100%

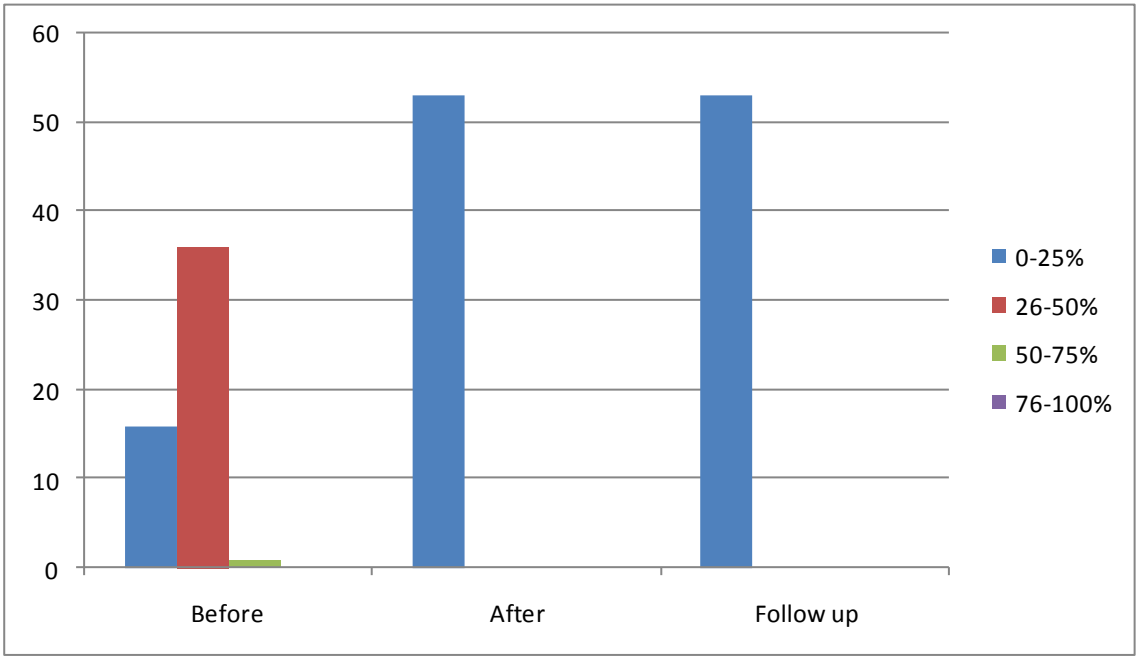
In group A, 27 patients (50.94%) were having upto 25% score, 26 patients (49.06%) were having 26-50% score before treatment. 53(100%) patients were having upto 25% score after treatment, whereas after follow up also 53 (100%) patients were having upto 25% score.

In group B, 16 patients (30.18%) were having upto 25% score, 36 patients (67.92%) were having 26-50%, 1(1.88%) patients were having 51-75% score before treatment. 53(100%) patients were having upto 25% score after treatment, whereas after follow up also 53 (100%) patients were having upto 25% score.

Graph No.: 38 Distribution of Observation OLB score Group A.



Graph No.: 39 Distribution of Observation OLB score Group B.



Schobers test

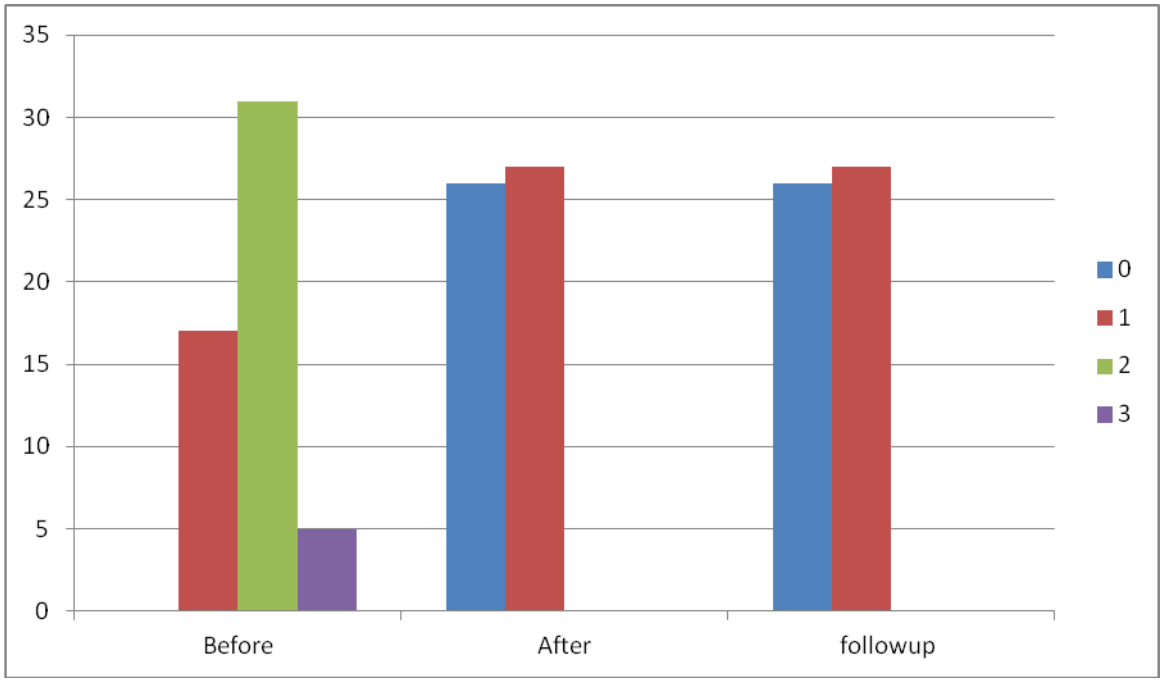
Table no.: 67 Observation on Scoring for schobers test.

Interpretation	Score	Group A			Group B		
		Before (%)	After (%)	Followup (%)	Before (%)	After (%)	Followup (%)
Flexion up to 5 cm and more distance	0	00	26 (49.06%)	26 (49.06%)	00	22 (41.50%)	21 (39.63%)
Flexion up to 3 cm distance	1	17 (32.07%)	27 (50.94%)	27 (50.94%)	3 (5.66%)	31 (58.50%)	32 (60.37%)
Flexion up to 2 cm distance	2	31 (58.50%)	00	00	43 (81.13%)	00	00
Flexion upto 1 cm distance	3	5(9.43%)	00	00	7 (13.20%)	00	00
Total	Count	53	53	53	53	53	53
	%	100%	100%	100%	100%	100%	100%

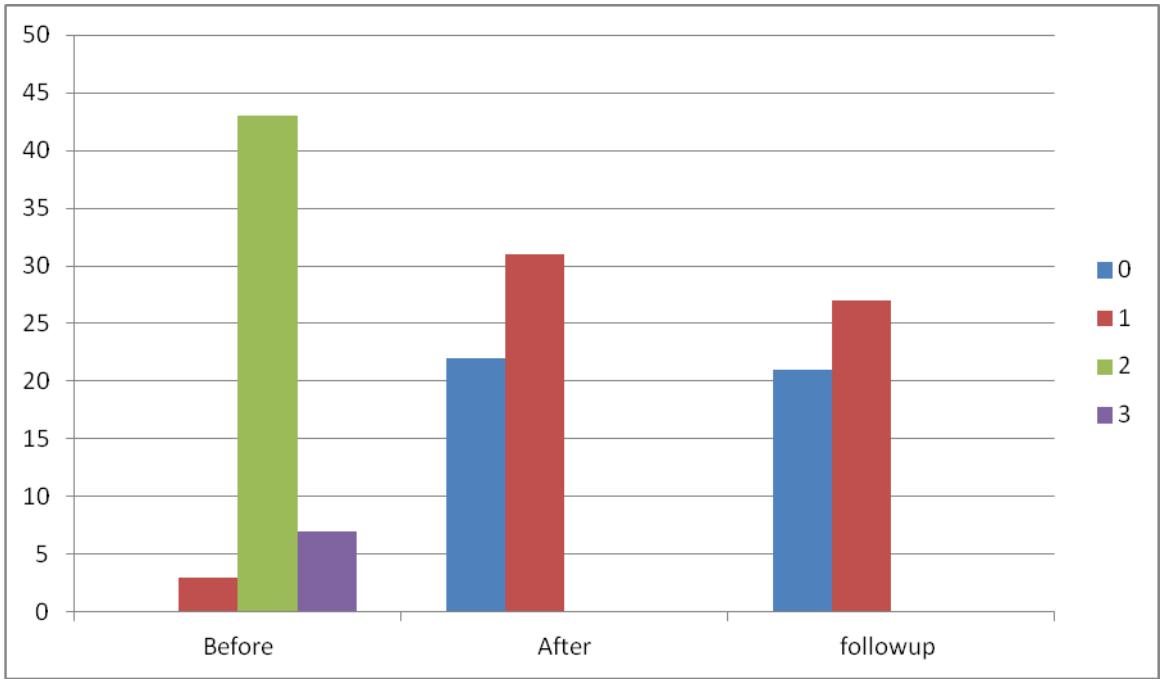
In group A, 17 patients (32.07%) were having 1 score, 31 patients (58.50%) were having 2 score 5 patients (9.43%) were having 3 score before treatment. 26 patients (49.06%) were having 0 score, 27 patients (50.94%) were having 1 score after treatment, whereas after follow up also 26 patients (49.06%) were having 0 score, 27 patients (50.94%) were having 1 score .

In group B, 3 patients (5.66%) were having 1 score, 43 patients (81.13%) were having 2 score 7 patients (13.20%) were having 3 score before treatment. 22 patients (41.50%) were having 0 score, 31 patients (58.50%) were having 1 score after treatment, whereas after follow up 21 patients (39.63%) were having 0 score, 32 patients (60.37%) were having 1 score .

Graph No.:40 Distribution of Observation Schobers Test Group A.



Graph No.:41 Distribution of Observation Schobers Test Group B.



♦ **Lateral flexion**

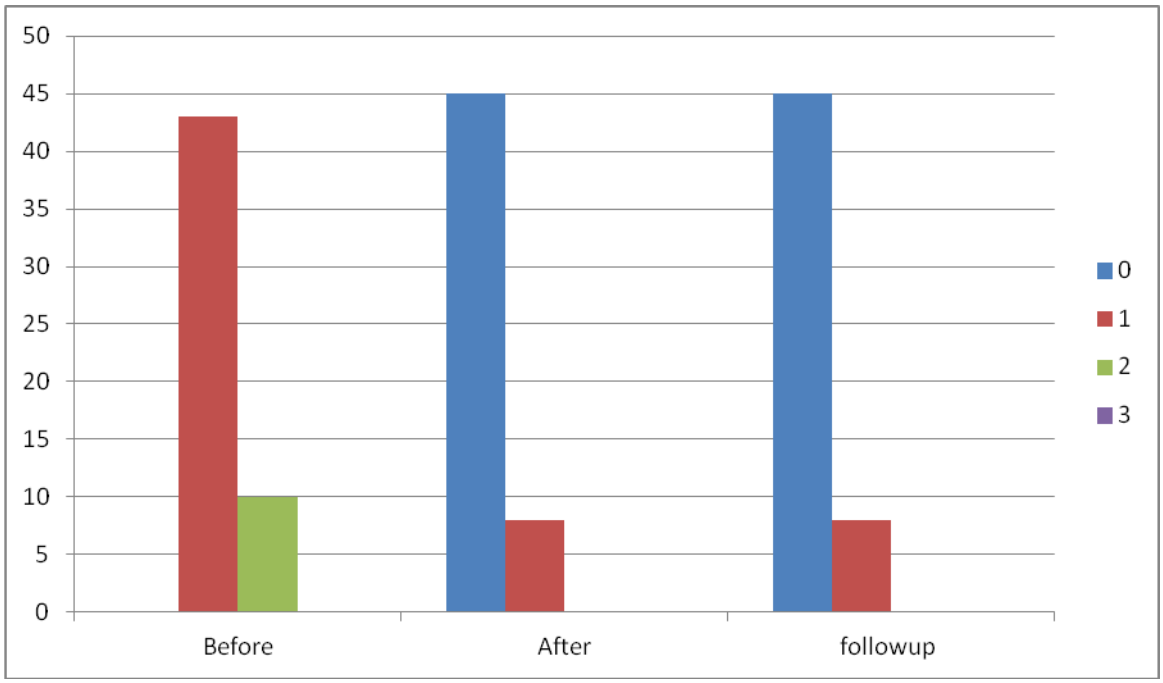
Table no.:68 Observation on Gradation for lateral flexion.

Interpretation	Score	Group A			Group B		
		Before (%)	After (%)	Followup (%)	Before (%)	After (%)	Follow up (%)
Can do lateral flexion easily	0	0	45 (84.90%)	45 (84.90%)	00	45 (84.90%)	45 (84.90 %)
Can lateral flex with difficulty	1	43 (81.13%)	8 (15.09%)	8 (15.09%)	41 (77.35%)	8 (15.09%)	8 (15.09 %)
Cannot perform lateral flexion.	2	10 (18.86%)	00	00	12 (22.64%)	00	00
Total	Count	53	53	53	53	53	53
	%	100%	100%	100%	100%	100%	100%

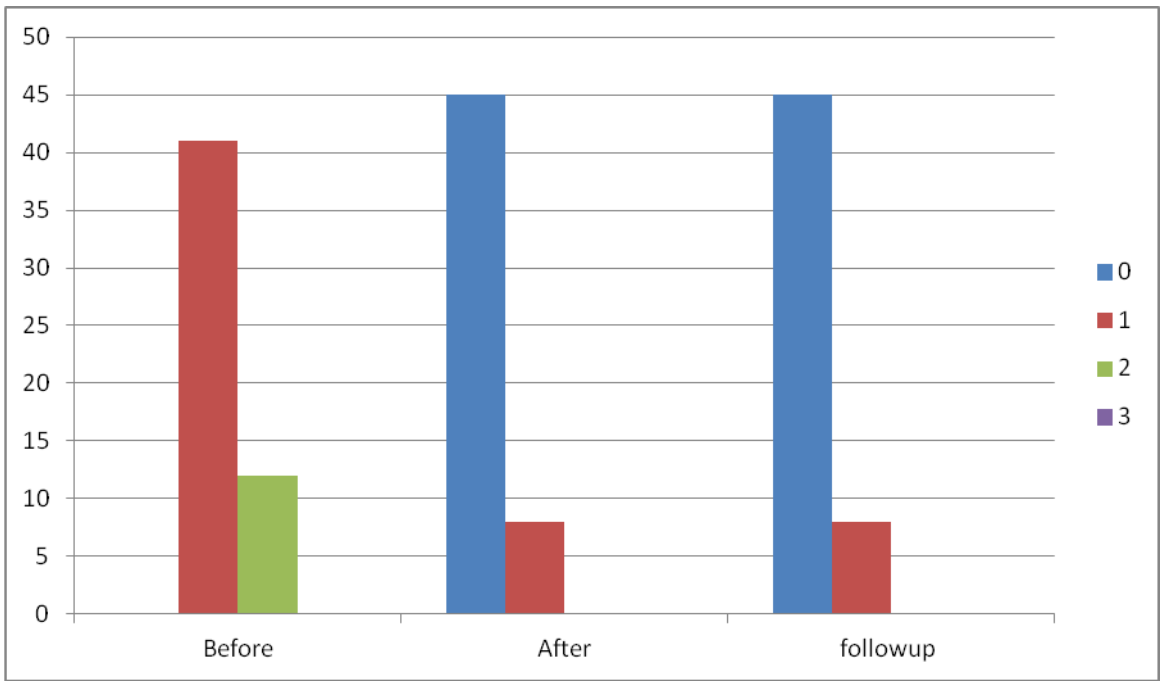
In group A, 43 patients (81.13%) were having 1 score, 10 patients (18.86%) were having 2 score before treatment. 45 patients (84.90%) were having 0 score, 8 patients (15.09%) were having 1 score after treatment, whereas after follow up also 45 patients (84.90%) were having 0 score, 8 patients (15.09%) were having 1 score .

In group B, 41 patients (77.35%) were having 1 score, 12 patients (22.64%) were having 2 score before treatment. 45 patients (84.90%) were having 0 score, 8 patients (15.09%) were having 1 score after treatment, whereas after follow up also 45 patients (84.90%) were having 0 score, 8 patients (15.09%) were having 1 score .

Graph No.:42 Distribution of Observation Lateral Flexion Group A.



Graph No.:43 Distribution of Observation Lateral Flexion Group B.



♦ **Rotation**

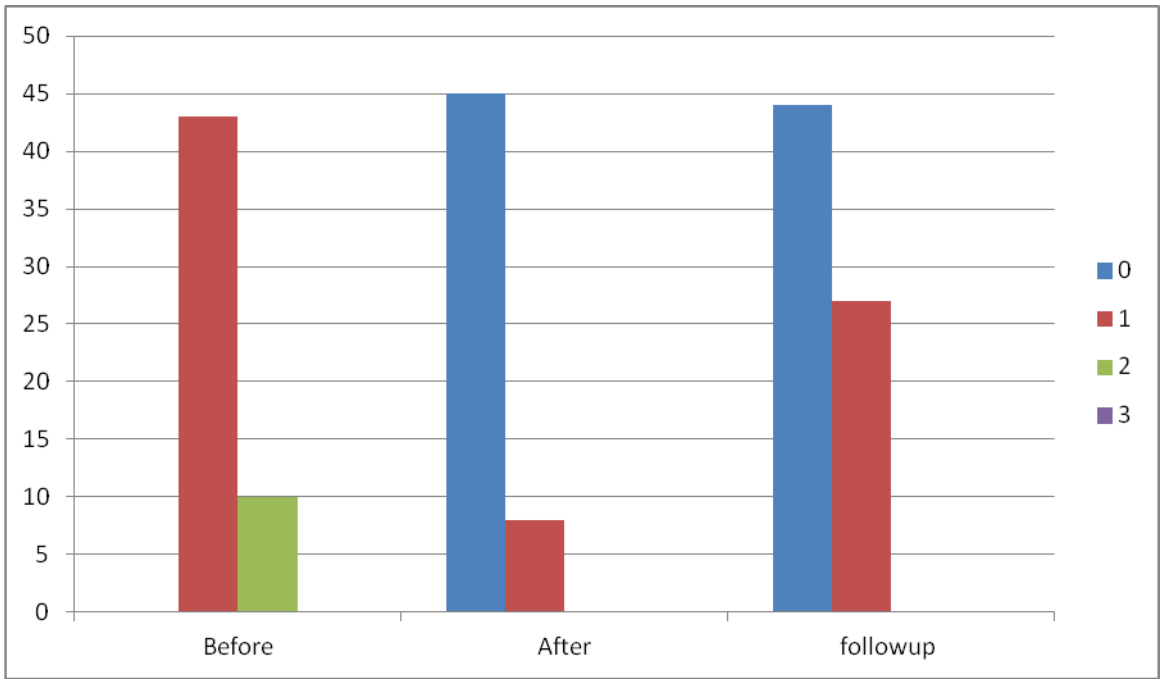
Table no.: 69 Observation on Gradation for rotation.

Interpretation	Score	Group A			Group B		
		Before (%)	After (%)	Follow up (%)	Before (%)	After (%)	Followup (%)
Can rotate easily	0	00	45 (84.90%)	44 (83.01%)	00	47 (88.67%)	47 (88.67%)
Rotation with difficulty	1	43 (81.13%)	8 (15.09%)	9 (16.98%)	42 (79.24%)	6 (11.32%)	6 (11.32%)
Cannot rotate.	2	10 (18.86%)	00	00	11 (20.75%)	00	00
Total	Count	53	53	53	53	53	53
	%	100%	100%	100%	100%	100%	100%

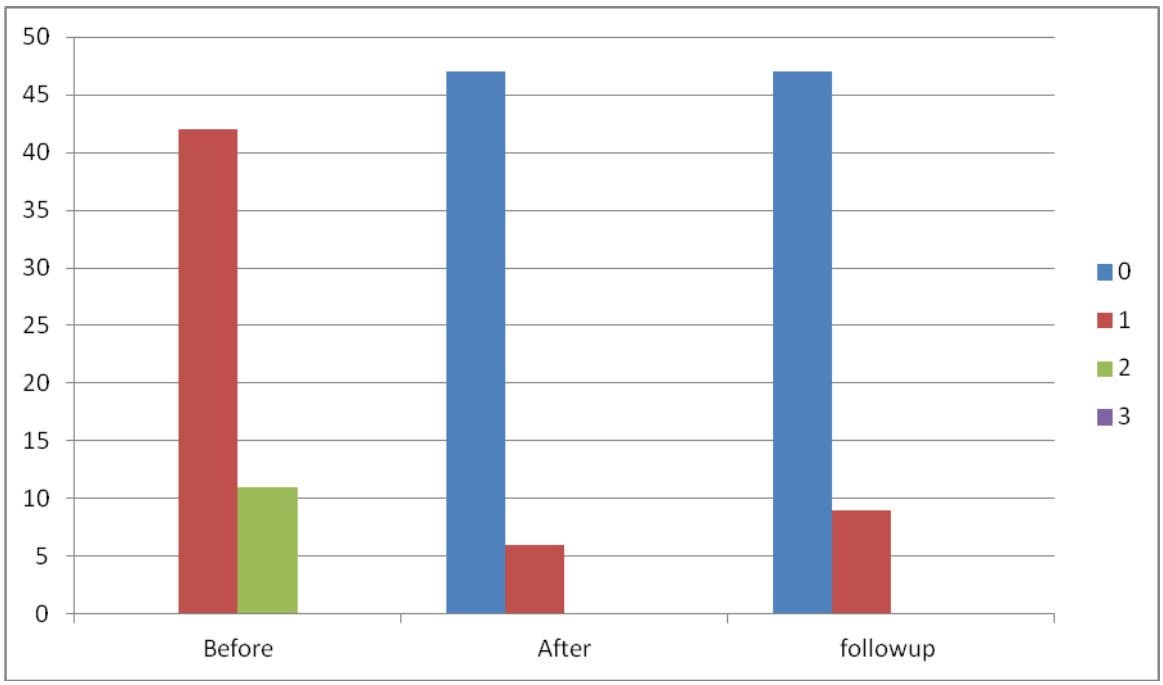
In group A, 43 patients (81.13%) were having 1 score, 10 patients (18.86%) were having 2 score before treatment. 45 patients (84.90%) were having 0 score, 8 patients (15.09%) were having 1 score after treatment, whereas after follow up 44 patients (83.01%) were having 0 score, 9 patients (16.98%) were having 1 score .

In group B, 42 patients (79.24%) were having 1 score, 11 patients (20.75%) were having 2 score before treatment. 47 patients (88.67%) were having 0 score, 6 patients (11.32%) were having 1 score after treatment, whereas after follow up also 47 patients (88.67%) were having 0 score, 6 patients (11.32%) were having 1 score .

Graph No.:44 Distribution of Observation Rotation Group A.



Graph No.: 45 Distribution of Observation Rotation Group B.



♦ **Flexion** .

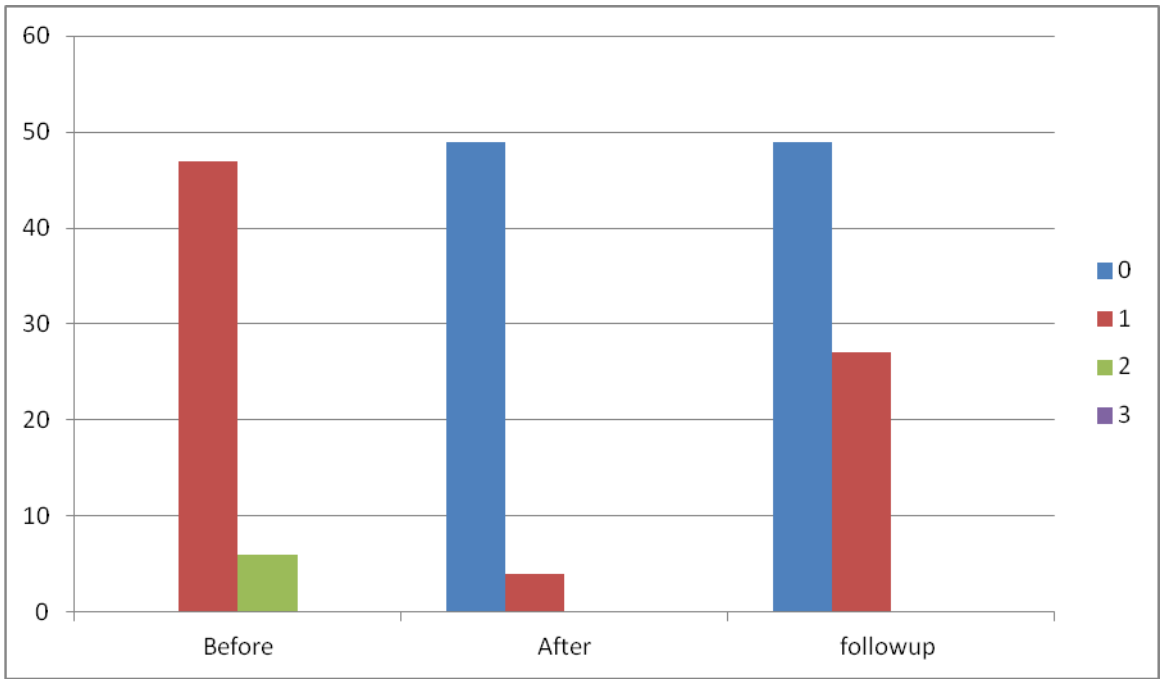
Table no.:70 Observation on Gradation for flexion.

Interpretation	Score	Group A			Group B		
		Before (%)	After (%)	Followup (%)	Before (%)	After (%)	Followup (%)
Can do flexion easily	0	00	49 (92.45%)	49 (92.45 %)	00	49 (92.45)	48 (90.56%)
Can flex with difficulty	1	47 (88.67%)	4 (7.54%)	4 (7.54%)	44 (83.01%)	4 (7.54%)	5 (9.43%)
Cannot perform flexion.	2	6 (11.32%)	00	00	9 (16.98%)	00	00
Total	Count	53	53	53	53	53	53
	%	100%	100%	100%	100%	100%	100%

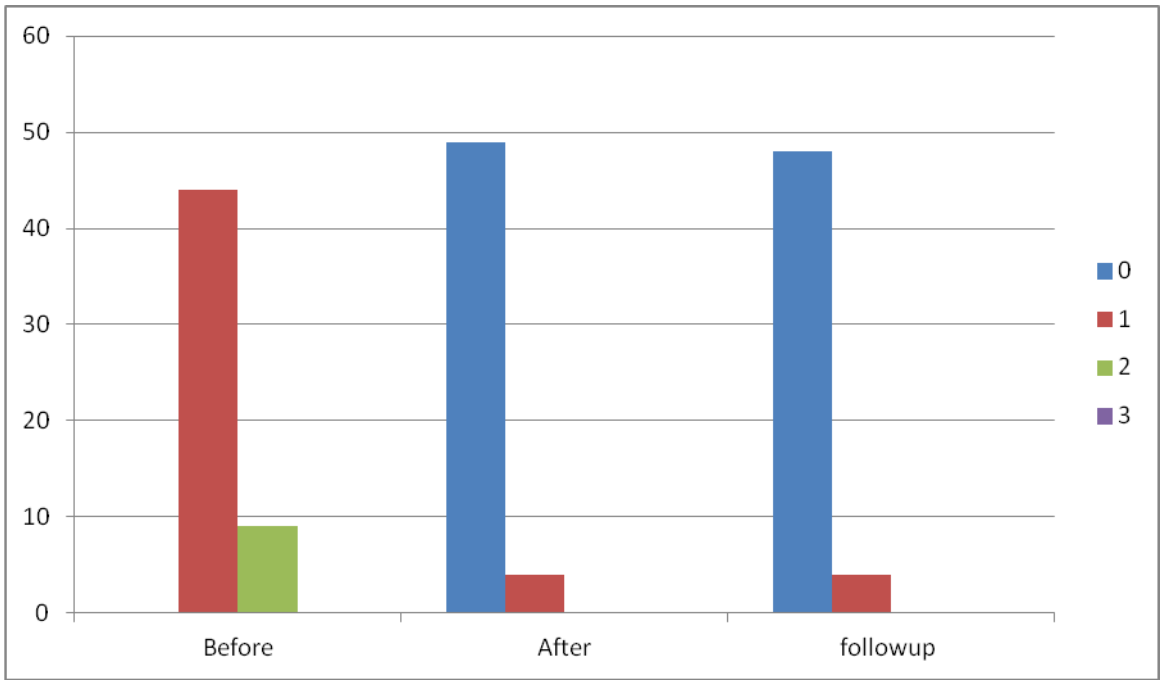
In group A, 47 patients (88.67%) were having 1 score, 6 patients (11.32%) were having 2 score before treatment. 49 patients (92.45%) were having 0 score, 4 patients (7.54%) were having 1 score after treatment, whereas after follow up also 49 patients (92.45%) were having 0 score, 4 patients (7.54 %) were having 1 score .

In group B, 44 patients (83.01%) were having 1 score, 9 patients (16.98%) were having 2 score before treatment. 49 patients (92.45%) were having 0 score, 4 patients (7.54%) were having 1 score after treatment, whereas after follow up 48 patients (90.56%) were having 0 score, 5 patients (9.43%) were having 1 score .

Graph No.:46 Distribution of Observation Flexion Group A.



Graph No.:47 Distribution of Observation Flexion Group B.



♦ **Tenderness**

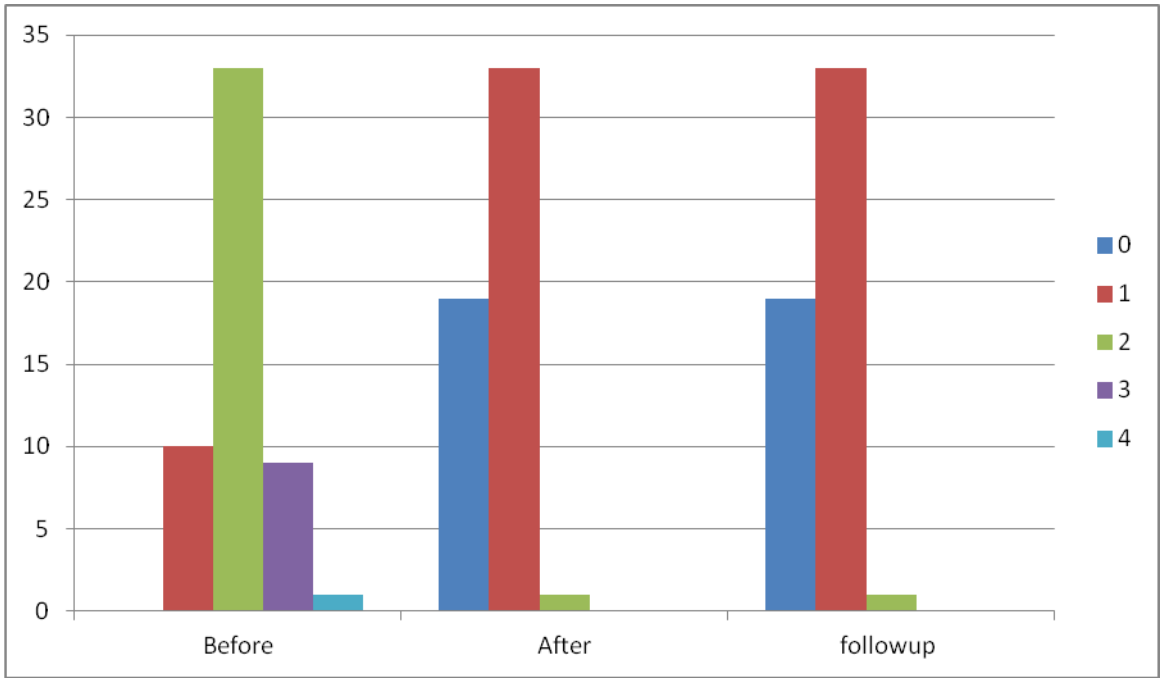
Table no.:71 Observation on Gradation for tenderness.

Interpretation	Score	Group A			Group B		
		Before (%)	After (%)	Followup (%)	Before (%)	After (%)	Followup (%)
No pain	0	00	19 (35.84%)	19 (35.84%)	00	12 (22.64%)	12 (22.64%)
Patient says it's paining	1	10 (18.86%)	33 (62.26%)	33 (62.26%)	00	41 (77.35%)	41 (77.35%)
Patient winces	2	33 (62.26%)	1 (1.88%)	1 (1.88%)	38 (71.69%)	00	00
Patient winces and withdraws the part	3	9 (17%)	00	00	15 (28.30%)	00	00
Patient does not allow to touch the part	4	1 (1.88%)	00	00	00	00	00
No pain	5	00	00	00	00	00	00
Total	Count	53	53	53	53	53	53
	%	100%	100%	100%	100%	100%	100%

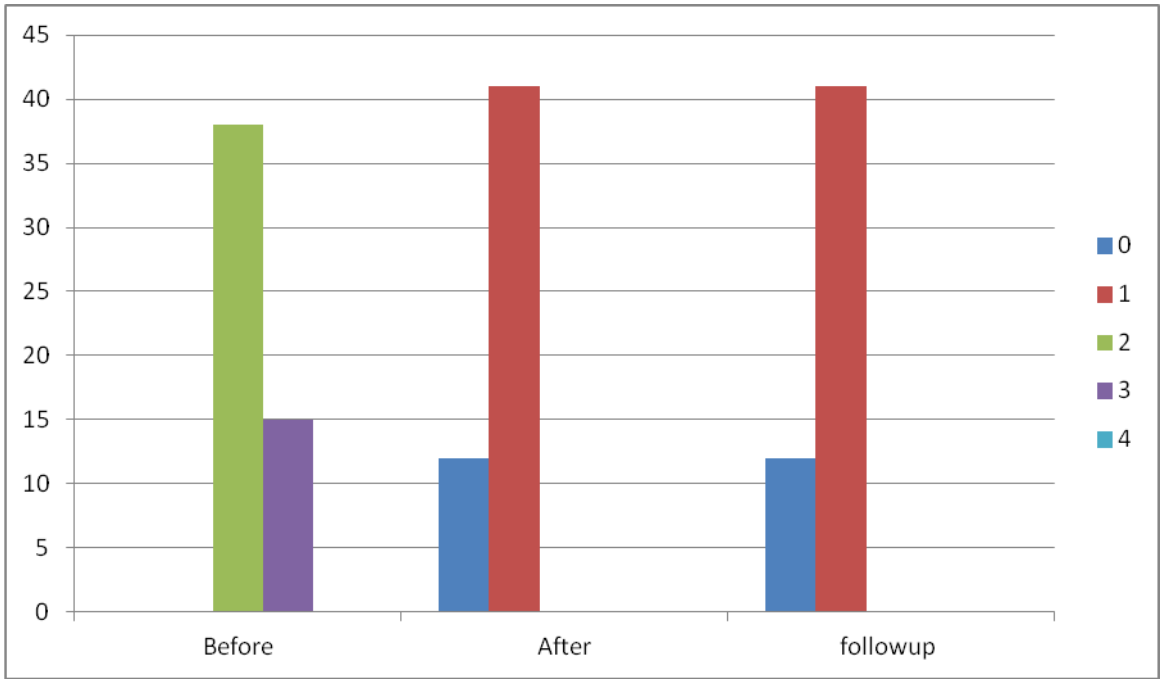
In group A, 10 patients (18.86%) were having 1 score, 33 patients (62.26%) were having 2 score, 9 patients (17%) were having 3 score, 1 patients 1.88(%) were having 4 score before treatment. 19 patients (35.84%) were having 0 score, 33 patients (62.26%) were having 1 score 1 patient (1.88%) were having 2 score after treatment, whereas after follow up also 19 patients (35.84%) were having 0 score, 33 patients (62.26%) were having 1 score 1 patient (1.88%) were having 2 score.

In group B, 38 patients (71.69%) were having 1 score, 15 patients (28.30%) were having 2 score before treatment. 12 patients (22.64%) were having 0 score, 41 patients (77.35%) were having 1 score after treatment, whereas after follow up also 12 patients (22.64%) were having 0 score, 41 patients (77.35%) were having 1 score .

Graph No.:48 Distribution of Observation Tenderness Group A.



Graph No.:49 Distribution of Observation Tenderness Group B.



5. RESULTS

Statistical analysis of different parameters:-

To test within group effects, 'Friedman test' is used with pairwise Wilcoxon signed rank test (Bonferroni corrected) as post- hoc test while for inter-group comparison, (i.e. for comparing two groups with each other) "Mann Whitney U test" is used.

For Friedman test, our Hypothesis were –

H_0 : There is no reduction in the score of parameter.

H_1 : There is reduction in score of the parameter for atleast one time interval.

For Mann Whitney U test our Hypothesis were of form –

H_0 : Reduction in scores for group A and group B is identical. (identically distributed)

H_1 : Reduction in scores for group A and group B is not identical. (not identically distributed).

For quantitative data, "Paired t test" is used to test intra-group significance while for testing inter-group significance, "Unpaired t test" is used.

For Paired t test, our Hypothesis were –

H_0 : mean difference between before treatment and after treatment values is zero.

H_1 : Mean difference between before treatment and after treatment values is greater than zero.

For Unpaired t test our Hypothesis were of form –

H_0 : Mean reduction for group A and group B is equal.

H_1 : Mean reduction for group A and group B are not equal.

We have tested these hypotheses for each parameter / sign & symptoms and result is interpreted accordingly. Appropriate summary statistics – S.D.s, IQR (Interquaritle Range), Means and Medians are provided where necessary. Observations and results are also supplemented with graphs and diagrams. The level of significance is kept at 0.05.

Intra-group Analysis

Group A

Table no.:72

Signs & Symptoms	n	Median Score			d.f.	Friedman Chi-square test	P – Value
		Bef	**8th Day**	**15th day**			
Schober's test	53	2	1	1	2	106	< 0.001
Lateral Flexion	53	1	0	0	2	106	< 0.001
Rotation	53	1	0	0	2	104.038	< 0.001
Flexion	53	1	0	0	2	106	< 0.001
Tenderness	53	2	1	1	2	104.683	< 0.001
Pain (OLB score)	53	24.44	6.6	6.6	2	101.639	< 0.001

i) Schober's test

For group A, The Schober's test score showed significant reduction (Friedman chi-square = 106, P-value < 0.001) at 5% level of significance after treated with Nirgudi patra pinda sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in Schober' test score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no differnce between Schober's test score at 8th Day and 15th day.

Table no:73

P- values (Bonferroni corrected)	**8th Day**	**15th Day**
Bef	< 0.001	< 0.001
8th Day	-	-

ii) Lateral flexion

For group A, The Lateral flexion score showed significant reduction (Friedman chi-square = 106, P-value < 0.001) at 5% level of significance after treated with Nirgudi patra pinda sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in lateral flexion score for time interval bef – 8th

day and bef – 15th day was significant (both P-values < 0.001) while there was no differnce between Lateral flexion score at 8th Day and 15th day.

Table no.:74

P- values (Bonferroni corrected)	8th Day	15th Day
bef	< 0.001	< 0.001
8th Day	-	-

iii) Rotation

For group A, The Rotation score showed significant reduction (Friedman chi-square = 104.038, P-value < 0.001) at 5% level of significance after treated with Nirgudi patra pinda sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in rotation score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no significant differnce (P-value = 1) between Rotation score at 8th Day and 15th day.

Table no.:75

P- values (Bonferroni corrected)	8th Day	15th Day
bef	< 0.001	< 0.001
8th Day	-	1

iv) Flexion

For group A, The Flexion score showed significant reduction (Friedman chi-square = 106, P-value < 0.001) at 5% level of significance after treated with Nirgudi patra pinda sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in flexion score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no differnce between Flexion score at 8th Day and 15th day.

Table no.:76

P- values (Bonferroni corrected)	8th Day	15th Day
bef	< 0.001	< 0.001
8th Day	-	-

v) Tenderness

For group A, The Tenderness score showed significant reduction (Friedman chi-square = 104.683, P-value < 0.001) at 5% level of significance after treated with Nirgudi patra pinda sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in tenderness score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no significant differnce (P-value = 1) between Tenderness score at 8th Day and 15th day.

Table no.:77

P- values (Bonferroni corrected)	8th Day	15th Day
bef	< 0.001	< 0.001
8th Day	-	1

vi) Pain (OLB score)

For group A, The Pain OLB score score showed significant reduction (Friedman chi-square = 101.639, P-value < 0.001) at 5% level of significance after treated with Nirgudi patra pinda sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in Pain OLB score score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no significant differnce (P-value = 0.8) between Pain OLB score score at 8th Day and 15th day.

Table no.:78

P- values (Bonferroni corrected)	8th Day	15th Day
Bef	< 0.001	< 0.001
8th Day	-	0.8

Intra-group Analysis

Group B

Table no.: 79

Signs & Symptoms	N	Median Score			d.f.	Friedman Chi-square test	P – Value
		Bef	**8th Day**	**15th day**			
Schober's test	53	2	1	1	2	104.049	< 0.001
Lateral Flexion	53	1	0	0	2	106	< 0.001
Rotation	53	1	0	0	2	106	< 0.001
Flexion	53	1	0	0	2	104.038	< 0.001
Tenderness	53	2	1	1	2	104.683	< 0.001
Pain (OLB score)	53	30	11.11	11.11	2	95.282	< 0.001

i) Schober's test

For group B, The Schober's test score showed significant reduction (Friedman chi-square = 104.049, P-value < 0.001) at 5% level of significance after treated with Nirgudi patra nadi sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in Schober' test score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no signficant differnce (P-value = 1) between Schober's test score at 8th Day and 15th day.

Table no.: 80

P- values (Bonferroni corrected)	**8th Day**	**15th Day**
Bef	< 0.001	< 0.001
8th Day	-	1

ii) Lateral flexion

For group B, The Lateral flexion score showed significant reduction (Friedman chi-square = 106, P-value < 0.001) at 5% level of significance after treated with Nirgudi patra nadi sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in lateral flexion score for time interval bef – 8th

day and bef – 15th day was significant (both P-values < 0.001) while there was no differnce between Lateral flexion score at 8th Day and 15th day.

Table no.: 81

P- values (Bonferroni corrected)	8th Day	15th Day
Bef	< 0.001	< 0.001
8th Day	-	-

iii) Rotation

For group B, The Rotation score showed significant reduction (Friedman chi-square = 104.038, P-value < 0.001) at 5% level of significance after treated with Nirgudi patra nadi sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in rotation score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no differnce between Rotation score at 8th Day and 15th day.

Table no.: 82

P- values (Bonferroni corrected)	8th Day	15th Day
Bef	< 0.001	< 0.001
8th Day	-	-

iv) Flexion

For group B, The Flexion score showed significant reduction (Friedman chi-square = 104.038, P-value < 0.001) at 5% level of significance after treated with Nirgudi patra nadi sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in flexion score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no significant differnce (P-value = 1) between Flexion score at 8th Day and 15th day.

Table no.: 83

P- values (Bonferroni corrected)	8th Day	15th Day
Bef	< 0.001	< 0.001
8th Day	-	1

v) Tenderness

For group B, The Tenderness score showed significant reduction (Friedman chi-square = 104.683, P-value < 0.001) at 5% level of significance after treated with Nirgudi patra nadi sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in tenderness score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no significant differnce (P-value = 1) between Tenderness score at 8th Day and 15th day.

Table no.: 84

P- values (Bonferroni corrected)	**8th Day**	**15th Day**
Bef	< 0.001	< 0.001
8th Day	-	1

vi) Pain (OLB score)

For group B, The Pain OLB score score showed significant reduction (Friedman chi-square = 101.639, P-value < 0.001) at 5% level of significance after treated with Nirgudi patra nadi sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in Pain OLB score score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) Also, there was significant differnce (P-value = 0.013) between Pain OLB score score at 8th Day (Mdn = 11.11, Mean = 10.57) and 15th day(Mdn = 11.11, Mean = 11.22) indicating that, pain increased significantly during time period 8th day – 15 th day.

Table no.: 85

P- values (Bonferroni corrected)	**8th Day**	**15th Day**
Bef	< 0.001	< 0.001
8th Day	-	0.013

Comparative Analysis (Inter-group analysis)

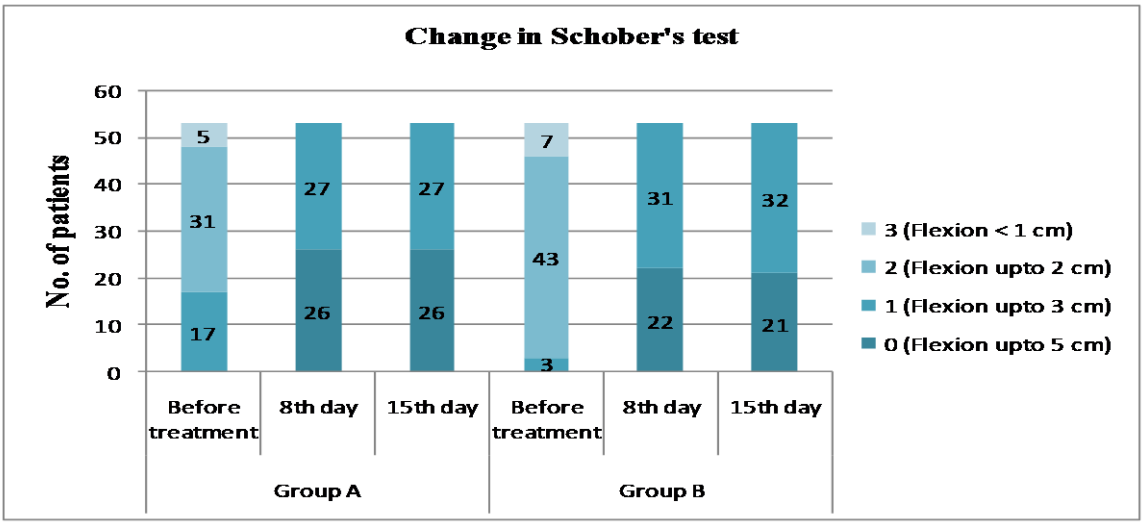
Table no.: 86

Signs & Symptoms	Comparison	Group A		Group B		Mann Whitney U test	P Value
		Mean difference	**Median difference**	**Mean difference**	**Median difference**		
Schober's test	Bef – 8th day	1.26	1	1.49	1	1086.5	0.017
	Bef – 15th day	1.26	1	1.47	1	1113	0.028
Lateral Flexion	Bef – 8th day	1.04	1	1.08	1	1351.5	0.407
	Bef – 15th day	1.04	1	1.08	1	1351.5	0.407
Rotation	Bef – 8th day	1.04	1	1.09	1	1325	0.246
	Bef – 15th day	1.02	1	1.09	1	1301	0.155
Flexion	Bef – 8th day	1.04	1	1.09	1	1325	0.246
	Bef – 15th day	1.04	1	1.08	1	1350.5	0.460
Tenderness	Bef – 8th day	1.36	1	1.51	2	1179.5	0.099
	Bef – 15th day	1.36	1	1.51	2	1179.5	0.099
Pain (OLB score)	Bef – 8th day	19.64	20	19.00	18	1411	0.970
	Bef – 15th day	19.45	18	18.36	18	1517	0.477

Comparative intergroup analysis of schobers test:

At 8th day, The reduction from baseline observed in Schober's test score for group A (Mean=1.26, Mdn=1) and group B (Mean = 1.49, Mdn = 1) was significantly different (U = 1086.5, P-value = 0.017) at 5% level of significance..

Also, the difference in schober's test score from baseline to 15th day for group A (Mean = 1.26, Mdn = 1) and group B (Mean = 1.47, Mdn = 1) was significantly different (U = 1113, P-value = 0.028). Therefore, it can be said that, Schober's test score showed higher reduction for group B treated with Nirgudi patra nadi sweda than group A which was treated with Nirgudi patra pinda sweda.



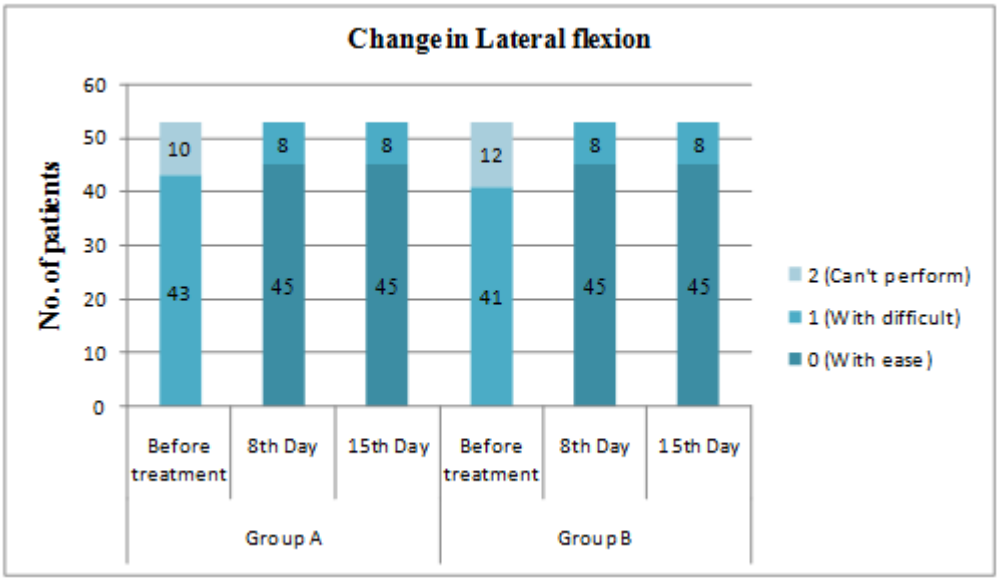
Graph no.: 50

Comparative intergroup analysis of lateral flexion:

At 8th day, The reduction from baseline in Lateral flexion score for group A (Mean=1.04, Mdn=1) and group B (Mean = 1.08, Mdn = 1) was insignificant (U = 1351.5, P-value = 0.407) at 5% level of significance.

Also, the difference in Lateral flexion score from baseline to 15th day for group A (Mean = 1.04, Mdn = 1) and group B (Mean = 1.08, Mdn = 1) was insignificant (U = 1351.5, P-value = 0.407). Therefore, it can be said that, Lateral flexion showed equal improvement for both group A and group B.

Graph no.:51

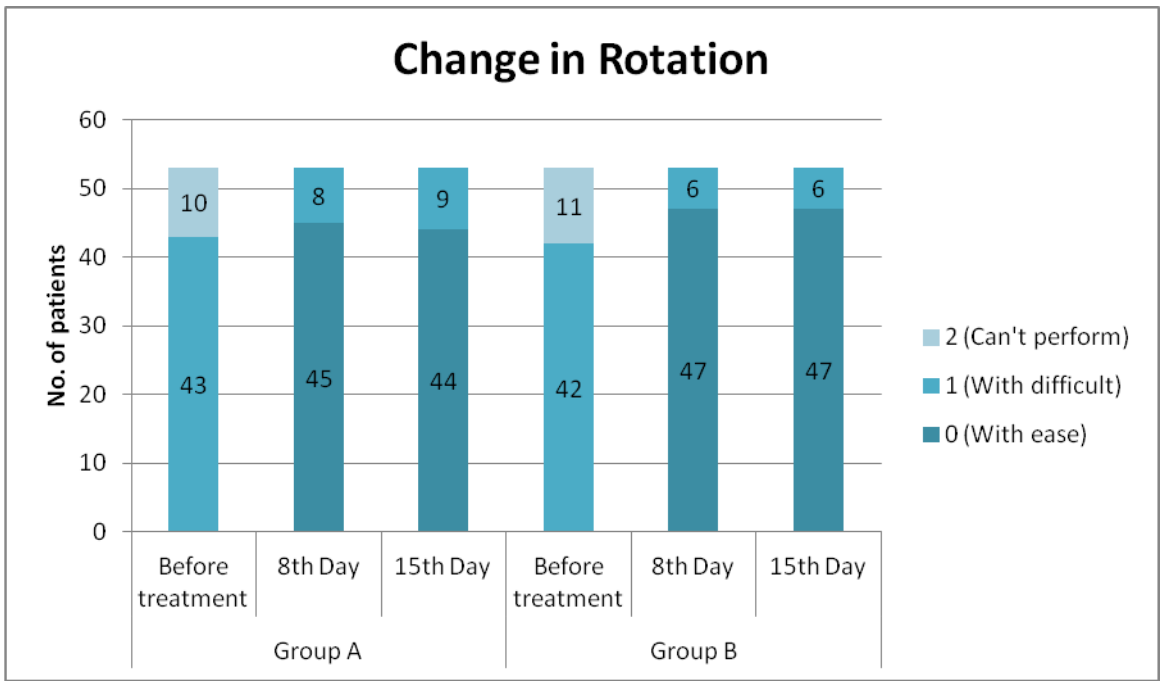


Comparative intergroup analysis of rotation:

At 8th day, The reduction from baseline in Rotation score for group A (Mean=1.04, Mdn=1) and group B (Mean = 1.09, Mdn = 1) was insignificant (U = 1325, P-value = 0.246) at 5% level of significance.

Also, the difference in Rotation score from baseline to 15th day for group A (Mean = 1.02, Mdn = 1) and group B (Mean = 1.09, Mdn = 1) was insignificant (U = 1301, P-value = 0.155). Therefore, it can be said that, both group A and group B showed equal improvement in Rotation.

Graph no.: 52

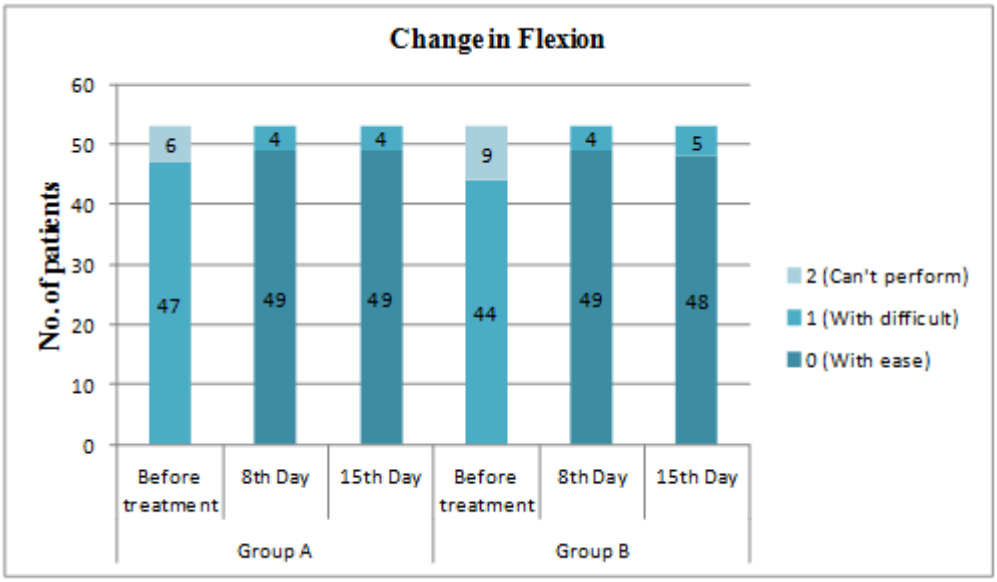


Comparative intergroup analysis of flexion:

At 8th day, the reduction from baseline in Flexion score for group A (Mean=1.04, Mdn=1) and group B (Mean = 1.09, Mdn = 1) was insignificant (U = 1325, P-value = 0.246) at 5% level of significance.

Also, the difference in Flexion score from baseline to 15th day for group A (Mean = 1.02, Mdn = 1) and group B (Mean = 1.08, Mdn = 1) was insignificant (U = 1350.5, P-value = 0.460). Therefore, it can be said that, Flexion showed equal improvement for group A and group B.

Graph no.:53

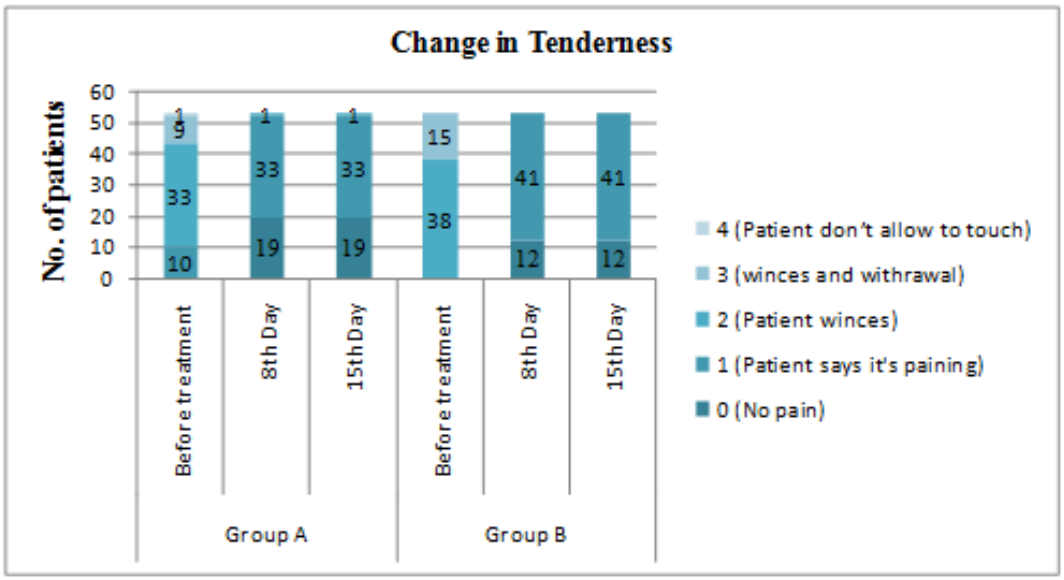


Comparative intergroup analysis of tenderness:

At 8th day, the reduction from baseline in Tenderness score for group A (Mean=1.36, Mdn=1) and group B (Mean = 1.51, Mdn = 2) was insignificant (U = 1179.5, P-value = 0.099) at 5% level of significance.

Also, the difference in Tenderness score from baseline to 15th day for group A (Mean = 1.36, Mdn = 1) and group B (Mean = 1.51, Mdn = 2) was insignificant (U = 1179.5, P-value = 0.099). Therefore, it can be said that, Tenderness was equally improved with both group A and group B.

Graph no.: 54

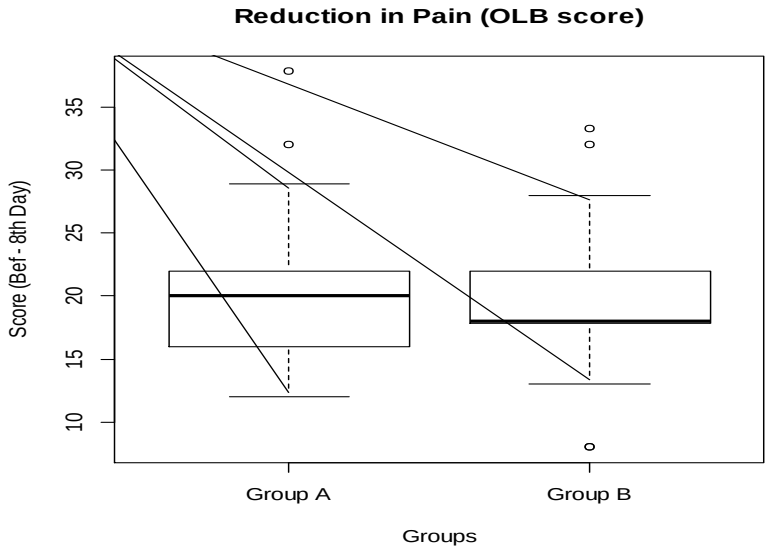


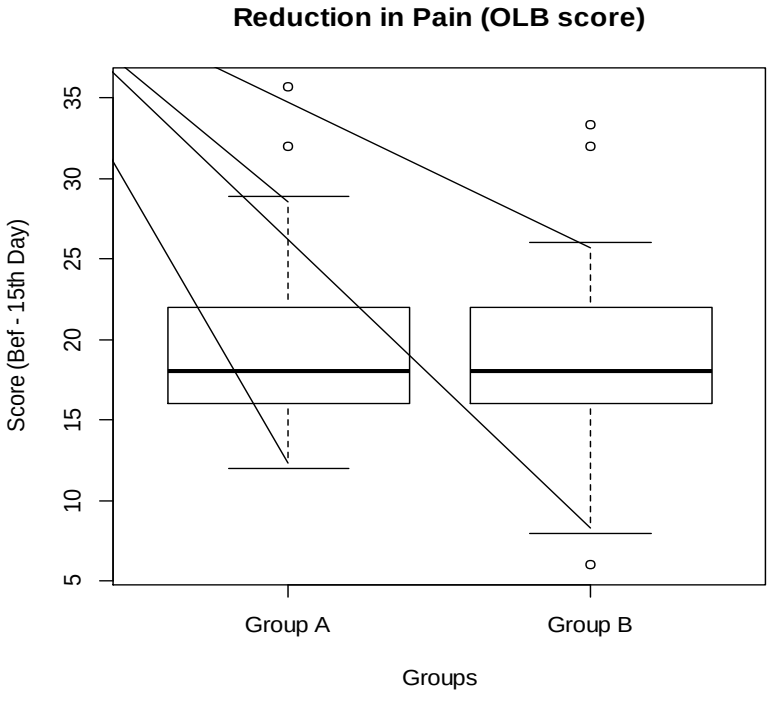
Comparative intergroup analysis of OLB scores:

At 8th day, The reduction from baseline in Pain score for group A (Mean=19.64, Mdn=20) and group B (Mean = 19, Mdn = 18) was insignificant (U = 1411, P-value = 0.970) at 5% level of significance.

Also, the difference in Pain score from baseline to 15th day for group A (Mean = 19.45, Mdn = 18) and group B (Mean = 18.36, Mdn = 18) was insignificant (U = 1517, P-value = 0.477). Therefore, it can be said that, pain was equally reduced with both group A and group B.

Graph no.:55





Onset of swedna lakshanas : -

Table no.:87

Swedana Lakshana	Group A			Group B			Mann Whitney U test	P Value
	Mean	Median	IQR (Q3 – Q1)	Mean	Median	IQR (Q3 – Q1)		
Sheeta vyuparam	1	1	0 (1 – 1)	1	1	0 (1 – 1)	-	-
Shool vyuparam	3.58	3	1 (4 – 3)	2.08	2	1 (3 – 2)	2470	< 0.001
Stambhanigraha	2.19	2	1 (3 – 2)	3.40	3	2 (4 – 2)	608	< 0.001
Gourav nigraha	1.89	2	1 (2 – 1)	2.45	2	1 (3 – 2)	1001	0.008
sweda strav	1	1	0 (1 – 1)	1	1	0 (1 – 1)	-	-
Vyadhihani	3.74	4	2 (5 – 3)	3.55	3	3 (5 – 2)	1530.5	0.414
Laghutva	1.94	2	1 (2 – 1)	2.40	2	2 (3 – 1)	1063.5	0.025

The sheeta Vyuparam was observed at first day itself for all patients in both group A and group B, thus as both groups can be considered as essentially same in reference to observance of Sheeta Vyuparam.

The Shool vyuparam was observed significantly earlier (U = 2470, P-value < 0.001) for group B (Mean = 2.08 days, Mdn = 2 days , IQR = 1 day) than it observed for group A (Mean = 3.58 days, Mdn = 3 days, IQR = 1 day). Thus we can say that, group B showed shool vyuparam lakshana in significantly less time than group A.

Time required to observe Stambhanigrapha for group A (Mean = 2.19 days, Mdn = 2 days, IQR = 1 day) was significantly lower (U = 608, P-value < 0.001) than time taken by group B (Mean = 3.40 days, Mdn = 3 days, IQR = 2 days) at 5% level of significance. Thus we can say that group A has significantly early occurrence of Stambhanigraha lakshana as compared to group B.

For group A, time required for observance of Gourav nigraha (Mean = 1.89 days, Mdn = 2 days, IQR = 1 day) was significantly lower (U = 1001, P-value = 0.008) than time required for group B (Mean = 2.45 day, Mdn = 2 day, IQR = 1 day) at 5% level of significance. Thus we can say that, group A has significantly early occurrence of Gourav nigraha than group B.

The Sweda strav was observed at first day itself for all patients in both group A and group B, thus as both groups can be considered as essentially same in reference to observance of Sweda strav.

Time required for observance of Vyadhihani for group A (Mean = 3.74 days, Mdn = 4 days, IQR = 2 days) and time required for group B(Mean = 3.55 days, Mdn = 3 days, IQR = 3 days) was not significantly different (U = 1530.5, P-value = 0.414) at 5% level of significance. Thus we can say that, group A and group B took equal time for the onset of Vyadhihani.

For group A, time required for observance of Laghutva (Mean = 1.94 days, Mdn = 2 days, IQR = 1 day) was significantly lower (U = 1001, P-value = 0.008) than time required for group B (Mean = 2.40 days, Mdn = 2 days, IQR = 2 days) at 5% level of significance. Thus we can say that, group A has significantly early occurrence of Laghutva than group B.

6. DISCUSSION

Discussion on swedana:

Sudation therapy i.e. swedana is one of the unique procedure of panchakarma therapy. The sudation therapy has been elaborated in detail during samhita period. The authors after the samhitakala followed the literature of samhita period.

In a context of charaka samhita the swedana is one among the shadvidha upakramas and included in bahiparimarjana chikitsa. The chaturvidha classification of swedana is a main contribution of sushruta samhita and included one among the sixty upakramas. In the consideration of the children mrudu sweda is described which is one of the unique contribution of kashyapa samhita. Aachraya harita opines the swedana as a type of langhana.

In concern with the qualities of swedana drugs we can find that the qualities like snigdha – ruksha , sara – sthira which are contradictory qualities & are present in swedana drugs.By this we can understood that all qualities are need not to be present in all the drugs instead they may be present in single dravya or the procedure.

पार्श्वपृष्ठकटिकुक्षीसंग्रहे गृध्रसिषुच ।
संकोचायामषूलेषू स्तंभगौरव सुप्तिषु ।
सर्वागेषु विकारेषु स्वेदन हितमुच्यते ॥ च. सु. १४/२४

Discussion on katishoola:

There are many references in vedic literature elaborating about back and locomotor system. The words anukam, anukyam has been used at many places to denote a back. In Upanishad and purana also the references are present about locomotor system.

In samhita period the diseases are being classified systemically. In charaka samhita though katishoola has been not enlisted in the 80 nanatmaja vatavyadhi, but in case of anukta vatavikara charaka stated that the vitiated vata reaches to which region, organ causes diseases such as shula, shosha, supti, sankocha, stambha. These all should be consider as vatavikar.

तएवापारिसख्येया भिदयमाना भवन्ति हि ।
रूजावर्णसमुत्थान स्थान संस्थान नामाभि ॥ च.सु.१९/४२

Aacharya Charaka stated that it is not possible to nomenclate all diseases therefore diseases can be nomenclate as per ruja, sthana, sansthana. Kati is one among the vata sthana.

Hence in Charaka samhita though katishoola has not been enlisted in the ukta nanatmaja vata vyadhi, by applying the principles of anukta vyadhi katishoola is considered as disease under vatavyadhi by its sthana and ruja.

Apart from this the elaboration of term katishool and it's nearby is present at many places. Aacharya sushruta has not included katishoola as a symptom in gridhrasi. In this way he has seperated the katishoola from gridhrasi. Acharya kashyapa has categorised the katishool as one of the disease occurs due to the improper management of labour (dushprajata). Katishool has been included by Aacharya Bhela in ekang roga.

Aacharya Bhela has narrated that katiprishtagata vata is the main factor in the manifestation of katishoola. In Ashtang hridaya and Madhavnidana also the elaboration of katishoola is present at many places. Yogratnakar has introduced the different terms like katishoola, kati vata, kati pida in vataroga chikitsa. Sharangadhara has mentioned the different medicines for katishoola. Nighantu ratnakar has given the status of individual disease to katishoola by describing the karmavipak of katishoola seperately.

Hence the katishool i.e. low back pain is an individual disease. In the present era the prevalence and incidence of katishoola i.e. low back pain is higher.

Low back pain:

Backache is now known as a modern international epidemic. Low back pain is second only to the common cold. Work that requires minimal physically strenuous activity has the lowest back injury rates, whereas work requiring repetitive and strenuous activity has the highest injury rates.

Importance of study: The back pain has become one of the leading cause of disability in our society and cost of the treatment has been increasing progressively each year without any obvious effect on the frequency and severity of condition. There is enormous economic pressure to provide rational and efficient care of patient with back pain. Despite the staggering annual costs of back pain to society there is paucity of well controlled clinical trials in this area.

In one study it has been quoted that 40percentage of back surgeries fail and even in successful surgeries, subsequent disability and pain have returned after a variable period of 6 months to 20 year.

Nirgundi: Nirgundi is the herb which has been widely used in ayurveda for treating the various diseases.This drug has been included under different gana/ varga in different classics.

The Synonyms of Nirgundi are elaborated in classics which are self explanatory about its wide range of action. This drug has been elaborated in many classics and nighantus with its varities and applicability.

The chemical constituents of nirgundi includes, leaves contain volatile essential oil and resin. Fruit contains acidic resin, astringent.Phenol, Dulcitol, Alkaloid – vitricine, β Sitosterol, Comphene,α & β – Pinenes, Angoside, Aucubin, Casticin, Artemesin, Orientin.

The useful parts of the Nirgundi are –Patra (Leaves), Beeja (Seeds), Moola Tvak (Root bark), Pushpa (Flowers).

The nirgundi possesses the katu-tikta rasa, laghu-ruksha guna, ushna veerya and katu vipaka.Among the properties of swedana drugs the ushna, ruksha properties are present in nirgundi.It is a best Vedanastapaka (analgesic), Shothahara (antiinflammatory), Vranashodhaka and Vrana ropaka, Keshya (hair tonic), Janthugna (anthelminthic), Balya and rasayana. The nirgundi is useful in most of the systemic disorders.In the ayurvedic classics the nirgundi has been elaborated at many places as a single drug therapy.

Recent Researches about Nirgundi also shows the multidimensional utility of this drug. The ehanolic extract of leaf vitex negundo shown a hepatoprotective activity against the antitubercular drug induced hepatotoxicity. The vitex negundo had shown the highest estrogenic like activity assessed on cell based proliferation assay.

The ehanolic leaf extract of vitex negundo in sub effective dose potentiate the antiinflamatory action of ibuprofen and phenalbutazone.

Methanolic extract of vitex negundo showed the decrease in the serum urate level. The leaves of vitex negundo shown a antihyperglycemic activities at the dosage of 5mg/20g.

The viex negundo possesses the both central and peripheral analgesic activity. The fresh leaves of nirgundi have pain inhibition and anti-inflammatory action by PG synthesis inhibition, antihistamine, membrane stabilizing and antioxidant activities. Chloroform soluble extract of leaves of vitex negundo yields the flavone vitexicarpin,

that has shown the cytotoxicity in a cancer cell line panel. The methanolic root extract of vitex negundo linn possess the potent snake venom neutralizing capacity.

Discussion on materials and methods:

This is a clinical study conducted to assess the efficacy of nirgundi patra in the form of swedana procedures viz., patrapinda sweda and nadisweda in katishool. Along with this the assessment of shulahara property of nirgundi in the form of pindasweda against nadisweda has been done. There are many samyaka swedana laxanas has been stated in classics to understand the sudation therapy. In this study an effort has been made to understand the virtue of different samyaka swedana laxanas.

The patients who fulfil the criteria were selected and randomly divided into two groups.

Total of 126 patients suffering from katishoola were registered in the study & the details are as follows :

- Total patients registered in the study : 126
- Patients subjected for Patra Pindasweda : 53
- Patients subjected for Nadisweda : 53
- Completed : 106
- Dropped out : 20

Inclusion criteria: To apply the oswestry low back pain score it is essential that patient must have a pain persisting more than 4 weeks.

Exclusion criteria: The patients having associated diseases like tuberculosis, fractures, disturbed bowel-bladder control and other complications are critical and need a different line of treatment. Also the patients having marked deformities of spinal column, spinal stenosis have a poor prognosis. Therefore these conditions are excluded.

Investigations: To understand the infectious condition, spinal deformity, the routine hematological investigations, routine urine investigations and radiological examination of the LS spine has been done.

Design: In this clinical study patients of either sex diagnosed as katishoola was randomly allocated into two group .

Group A was treated with pinda sweda and Group B was treated with nadi sweda. The duration of treatment was seven days. As aacharaya sushruta opines that saptahat paramchaiv kriyamanayan prayojayet.

The changes were determined by adopting standard methods of scoring by means of objective and subjective parameters. Assessment was done initially before the intervention and thereafter on 8^{th} and 15^{th} day.

Discussion on observation:

Among all the patients, collectively the 59.43 percent belongs to male whereas 40.57 percent were female. In group A, 50 patients (94percentage) were Hindu and 3 patients were Muslim (6percentage) while in group B, 49 patients were Hindu (92percentage) while 4 were Muslim (8percentage).The percentage of hindu community is more in the area where these clinical trial has been conducted. The patient other than these two community were not registered for a clinical trial.

Among all the patients, 8 patients (7.54percentage) were illiterate, 23 patients (22percentage) were educated up to primary school, 36 were studied into high school (34percentage) while remaining 39 patients (37percentage) were graduate. As per concern with the occupation 23 patients were farmer (22percentage), 7 were in business (7percentage), 27 patients were housewives (25percentage), 5 patients were student (4.71percentage), 29 patients (27percentage) were in service, 10 patients (9percentage) were workers while remaining 5 patients (4.71percentage) were in other category. This shows that a wide range of population is been affected by this calamity. This is affecting to the person who has rigourous, stressful lifestyle and also to the person who has sedentary lifestyle.

In concern with the socioeconomic status 29 patients (27percentage) were from poor class, 51 patients (48percentage) were from lower – middle class while remaining 26 patients (25percentage) were from upper middle class. Even though this disease affecting all the groups of socioeconomic status, the percentage is more from the lower middle class 51(48percentage).

92 patients were married (87percentage), 7 patients were unmarried (6.60percentage) while 6 patients were widow/widower (5.66percentage). The larger proportion of sample belongs to the married group whereas unmarried is less.

In the causative factor for onset of the disease, the percentage of gradual onset is more 63(59.43 percentage), followed by heavy working 17(16.03percentage), jerk 15(14.15percentage), travelling trauma 11(10.37percentage).This indicates that the

anatomical structures of low back get weakend by daily wear and tear , causes backpain gradually, apart from this due to heavy work, jerk, trauma while travelling,are also causative factor for backpain.

In concern with the personal history stressful lifestyle and heavy work 26(24.52percentage) is a major contributing factor among all the factors, which is indicative of impact of this factor upon katishool.

The duration of this disease varies from 4 months up to 25 month and above, this suggest the chronicity, severity, and importance of this calamity. In concern with the past illness the patient who had undergone surgical procedure 28 (26.41percentage), have more affliction than that of medicinal treatment 7(6.60percentage).

In case of family history regarding locomotor system, the percentage of paternal affliction is more than that of maternal one.

In concern with the obstetric history (number of child) the women who have two or more than two issue have higher percentage of affliction than who have one issue. Regarding the labor, the women who had a history of normal labor are more afflicted than cesarean one. This happens because in case of normal labor and more than one issue the anatomical structures are more stressful and come across tremendous pressure.

In concern with the prakriti the dominant group was vata pitta(46.22percentage).the vata is more prone for degeneration, the assistance along with pitta which has the properties like ushna tikhna increases the degeneration process.the second dominancy of kaphapitta here in this combination ushna tikshna properties of pitta are minimized by kapha. The lower dominanacy of kapha vata here the kapha having almost opposite properties to that of vata hence controls the degenerative properties of vata.

Regarding samhanata 23 patients (22percentage) were of Asamhata, 48(45percentage) patients were of Madhyam while 35 patients (33percentage) were of Susamhata. In concern with pramanata 42 patients (40percentage) were of heena pramanataha, 43 patients were of sama (41percentage) while 21 patients (20percentage) were of adhika pramanataha. Among all the patients 23 patients (22percentage) were of ekrasa satmyataha, 39 patients were of vyamishra (37percentage) while 44 patients (42percentage) were of sarvarasa satmyataha.

Among all the patients 43 patients (41percentage) were of avar satvataha, 49 patients were of madhyam (47percentage) while 14 patients (13percentage) were of pravar satvataha. Regarding ahar shakti 23 patients (22percentage) were of avara ahara shakti, 43 patients were of madhyam (41percentage) while 40 patients (38percentage) were of pravar ahara shakti. Among all the patients 27 patients (25percentage) were of Avara Jaran Shakti, 36 patients were of Madhyam (34percentage) while 43 patients (41percentage) were of Pravar Jaran Shakti. Regarding vyayama shakti 19 patients (18percentage) were of Avara Vyayam Shakti, 24 patients were of Madhyam (23percentage) while 63 patients (59percentage) were of Pravar Vyayam Shakti.

In concern with the spine, 24 patients (23percentage) were having exaggerated, 4 patients (3.77percentage) were having straightening of spine, 27 patients (25percentage) were having maintained while remaining 51 patients (48percentage) were with reduced normal lumbar lordosis. In the context of bone mineralization 51 patients (48percentage) were having normal mineralizaton, 11 patients (10percentage) were having decreased bone mineralization, 3 patient (2.83percentage) was with mild osteopenia. Mild osteoporosis was observed in 37 patients (35percentage) and 4(3.77percentage) with osteoporosis.

In group A, the disc space reduced between L2-L3, L5-S1 in 3 patients (2.87percentage), L3-L4, L4-L5, L5 S1 reduced in 1 patient (0.94percentage), L3-L4 disc space was reduced in 1 patient (0.94percentage), L4-L5, L5-S1 reduced in 3 patient (2.83percentage), 46 patient (43percentage) were having L5-S1 disc space reduction while remaining 48 patients (45percentage) were having maintained disc space. Among all the patients there were 9 patients (08percentage) with facetal arthropathy present while for 97 patients (92percentage) it was absent. In concern with the osteophytic outgrowth, degenerative osteophytic outgrowth was observed in 71 patients (67percentage) while in remaining 35 patients (33percentage) it was absent.

In concern with the bony lumbar canal 12 patients (11percentage) were having narrow L5 level, L4 L5 level narrow was in one patient (0.94percentage) while 93 patients (88percentage) were with normal Bony lumbar canal.All the 106 patients from both group A and group B were with intact vertebral bodies and pedicles. Among the total patient one patient has reported with the rt joint sacroilitis and one with lt joint sacroilitis, rest of all patient has a normal si joint.

This indicates that the patients suffering from back pain has not always the presence of significant pathological changes at segment of lumbar spine. Also the presence of pathological changes and the severity of symptoms is not always concurrent one.

Among all the patients 41 (38.67percentage) were with normal BMI, 59 patients (55.66percentage) were overweighed while 6 (5.66percentage) were obese. Hence this indicates the obesity also a supporting role in causation of back pain.

Regarding the observations of samyaka swedana laxanas newer dimensions has been observed.

The observance of sheetavyuparam has been found since first day in both the group.

The shoolavyuparama recorded in group A as from second day 6(11.32percentage, 22(41.50percentage) from third day, 17(32.07percentage) from fourth day, 6(11.32percentage) from fifth day, 2(3.77percentage) from sixth day. In group B as 12(22.64percentage) from first day,24(45.28percentage) from second day,17(32.07percentage) from third day. Here the nadi sweda shows early occurrence of shoola vyuparama than the pinda sweda.

The stambhanigraha has been observed in group A as 11(20.75percentage) from first day, 23(43.39percentage) from second day, 17(32.07percentage) from third day, 02(3.77percentage) from fourth day. In group B as 15(28.30percentage) from second day,13(24.52percentage) from third day, 14(26.41percentage) from fourth day, 11(20.75percentage) from fifth day. Here the pinda sweda shows eary occurrence of stambhanigraha than the nadi sweda.

The gouravanigraha recorded in group A as from first day 18(41.86percentage), 24(45.28percentage) from second day, 10(18.86percentage) from third day, 01(1.88percentage) from fourth day. In group B as 13(24.52percentage)from first day,15(28.30percentage) from second day,13(24.52percentage) from third day, 12(22.64percentage) from fourth day. Here the pinda sweda shows early occurrence of gouravanigraha than the nadi sweda.

The observance of swedasrava has been found since first day in both the group.

The vyadhihani has been observed as in group A from second day 7(13.2percentage) , 19(35.84percentage) from third day, 13(24.52percentage) from fourth day,9(16.98percentage) fifth day, 5(9.43percentage) from sixth day. In group B

as 14(26.41percentage) from second day,14(26.41percentage) from third day, 10(18.86percentage) from fourth day,12(22.64percentage) from fifth day, 3(5.66percentage) from sixth day. Here both the procedures are effective in vyadhihani. Both procedures needs duration from second to sixth day for the onset of this samyaka swedana laxana.

The laghutva has been observed in group A as 19(35.84percentage) from first day, 23(43.39percentage) from second day, 9(16.98percentage) from third day, 02(3.77percentage) from fourth day. In group B as 15(28.30percentage)from first day,15(28.30percentage) from second day,12(22.6percentage) from third day, 11(20.75percentage) from fourth day. Here the pinda sweda shows early occurrence of gouravanigraha than the nadi sweda.but in both groups duration varies from first day to fourth day.

Discussion on results:

In the present study both group has shown significant result both clinically and statistically.

Intra-group Analysis

Group A

Schober's test:

For group A, The Schober's test score showed significant reduction (Friedman chi-square = 106, P-value < 0.001) at 5percentage level of significance after treated with nirgudi patra pinda sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in Schober' test score for time interval bef – 8^{th} day and bef – 15^{th} day was significant (both P-values < 0.001) while there was no differnce between Schober's test score at 8^{th} Day and 15^{th} day.This indicates that this procedure has significant improvement in this parameter on 8^{th} and 15^{th} day as compare to before treatment. As there is no difference between Schober's test score at 8^{th} Day and 15^{th} day this indicate that the effect of therapy was persisting till 15^{th} day.

Lateral flexion:

For group A, The Lateral flexion score showed significant reduction (Friedman chi-square = 106, P-value < 0.001) at 5percentage level of significance after treated with nirgudi patra pinda sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in lateral flexion score for time interval bef – 8^{th} day and bef – 15^{th} day was significant (both P-values < 0.001) while there was no differnce between lateral flexion score at 8^{th} Day and 15^{th} day. This

indicates that this procedure has significant improvement in this parameter on 8th and 15th day as compare to before treatment. As there is no difference between lateral flexion score at 8th Day and 15th day this indicate that the effect of therapy was persisting till 15th day.

Rotation:

For group A, The Rotation score showed significant reduction (Friedman chi-square = 104.038, P-value < 0.001) at 5percentage level of significance after treated with nirgudi patra pinda sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in rotation score for time interval bef – 8th day and bef – 15th day was significant. But there was no significant differnce between Rotation score at 8th Day and 15th day. This indicates that this procedure has significant improvement in this parameter on 8th and 15th day as compare to before treatment. As there is no difference between rotation score at 8th day and 15th day this indicate that the effect of therapy was persisting till 15th day.

Flexion:

For group A, The Flexion score showed significant reduction (Friedman chi-square = 106, P-value < 0.001) at 5percentage level of significance after treated with nirgudi patra pinda sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in flexion score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no differnce between Flexion score at 8th Day and 15th day. This indicates that this procedure has significant improvement in this parameter on 8th and 15th day as compare to before treatment. As there is no difference between flexion score at 8th Day and 15th day this indicate that the effect of therapy was persisting till 15th day.

Tenderness:

For group A, The Tenderness score showed significant reduction (Friedman chi-square = 104.683, P-value < 0.001) at 5percentage level of significance after treated with nirgudi patra pinda sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in tenderness score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no significant differnce (P-value = 1) between Tenderness score at 8th Day and 15th day. This indicates that this procedure has significant improvement in this parameter on 8th and 15th day in comparison with before treatment. The difference between tenderness

at 8th Day and 15th day is not significant this indicate that the effect of therapy was persisting till 15th day.

Pain (OLB score):

For group A, The Pain OLB score score showed significant reduction (Friedman chi-square = 101.639, P-value < 0.001) at 5percentage level of significance after treated with nirgudi patra pinda sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in Pain OLB score score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while the difference was insignificant (P-value = 0.8) between Pain OLB score score at 8th Day and 15th day. This indicates that this procedure has significant improvement in this parameter on 8th and 15th day as compare to before treatment. As there is no difference between Schober's test score at 8th Day and 15th day this indicate that the effect of therapy was persisting till 15th day.

Group B

Schober's test:

For group B, The Schober's test score showed significant reduction (Friedman chi-square = 104.049, P-value < 0.001) at 5percentage level of significance after treated with nirgudi patra nadi sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in Schober' test score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no signficant differnce (P-value = 1) between Schober's test score at 8th Day and 15th day. This indicates that this procedure has significant improvement in this parameter on 8th and 15th day as compare to before treatment. As there is no difference between Schober's test score at 8th day and 15th day this indicate that the effect of therapy was persisting till 15th day.

Lateral flexion:

For group B, The Lateral flexion score showed significant reduction (Friedman chi-square = 106, P-value < 0.001) at 5percentage level of significance after treated with nirgudi patra nadi sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in lateral flexion score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no differnce between Lateral flexion score at 8th day and 15th day. This indicates that this procedure has significant improvement in this parameter on 8th and 15th day as compare to before treatment. As there is no difference between lateral

flexion score at 8th day and 15th day this indicate that the effect of therapy was persisting till 15th day.

Rotation:

For group B, The Rotation score showed significant reduction (Friedman chi-square = 104.038, P-value < 0.001) at 5percentage level of significance after treated with nirgudi patra nadi sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in rotation score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no differnce between rotation score at 8th day and 15th day. This indicates that this procedure has significant improvement in this parameter on 8th and 15th day as compare to before treatment. As there is no difference between rotation score at 8th day and 15th day this indicate that the effect of therapy was persisting till 15th day.

Flexion:

For group B, The flexion score showed significant reduction (Friedman chi-square = 104.038, P-value < 0.001) at 5percentage level of significance after treated with nirgudi patra nadi sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in flexion score for time interval bef – 8th day and bef – 15th day was significant (both P-values < 0.001) while there was no significant differnce (P-value = 1) between flexion score at 8th day and 15th day. This indicates that this procedure has significant improvement in this parameter on 8th and 15th day as compare to before treatment. As there is no difference between flexion test score at 8th day and 15th day this indicate that the effect of therapy was persisting till 15th day.

Tenderness:

For group B, The Tenderness score showed significant reduction (Friedman chi-square = 104.683, P-value < 0.001) at 5percentage level of significance after treated with nirgudi patra nadi sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in tenderness score for time interval bef – 8th day and bef – 15th day was significant. There was insignificant differnce between tenderness score at 8th Day and 15th day. This indicates that this procedure has significant improvement in this parameter on 8th and 15th day as compare to before treatment. As there is no difference between tenderness score at 8th day and 15th day this indicate that the effect of therapy was persisting till 15th day.

Pain (OLB score)

For group B, The Pain OLB score score showed significant reduction (Friedman chi-square = 101.639, P-value < 0.001) at 5percentage level of significance after treated with Nirgudi patra pinda sweda. Post-Hoc analysis using pairwise Wilcoxon signed rank test showed that, the reduction in Pain OLB score score for time interval bef – 8^{th} day and bef – 15^{th} day was significant (both P-values < 0.001) Also, the difference was significant of pain OLB score score at 8^{th} day (Mdn = 11.11, Mean = 10.57) and 15^{th} day(Mdn = 11.11, Mean = 11.22) indicating that, pain increased significantly during time period 8th day – 15 th day.

This denotes that this procedure has shown a significant improvement in this parameter on 8th and 15th day as compare to before treatment. As there is difference between OLB score at 8th Day and 15th day this indicate that the effect of therapy was declining till 15th day.

Comparative Analysis (Inter-group analysis):

Schobers test:

At 8^{th} day, the reduction from baseline observed in Schober's test score for group A (Mean=1.26, Mdn=1) and group B (Mean = 1.49, Mdn = 1) was significantly different (U = 1086.5, P-value = 0.017) at 5percentage level of significance. Also, the difference in schober's test score from baseline to 15^{th} day for group A (Mean = 1.26, Mdn = 1) and group B (Mean = 1.47, Mdn = 1) was significantly different (U = 1113, P-value = 0.028). Therefore, it can be said that, Schober's test score showed higher reduction for group B treated with Nirgudi patra nadi sweda than group A which was treated with Nirgudi patra pinda sweda.

Lateral Flexion:

At 8^{th} day, the reduction from baseline in Lateral flexion score for group A (Mean=1.04, Mdn=1) and group B (Mean = 1.08, Mdn = 1) was insignificant (U = 1351.5, P-value = 0.407) at 5percentage level of significance. Also, the difference in Lateral flexion score from baseline to 15^{th} day for group A (Mean = 1.04, Mdn = 1) and group B (Mean = 1.08, Mdn = 1) was insignificant (U = 1351.5, P-value = 0.407). Therefore, it can be said that, Lateral flexion showed equal improvement for both group A and group B.

Rotation:

At 8^{th} day, the reduction from baseline in Rotation score at 5percentage level of significance for group A (Mean=1.04, Mdn=1) and group B (Mean = 1.09, Mdn = 1) was insignificant (U = 1325, P-value = 0.246). Also, the difference in Rotation

score from baseline to 15th day for group A (Mean = 1.02, Mdn = 1) and group B (Mean = 1.09, Mdn = 1) was insignificant (U = 1301, P-value = 0.155). Therefore, it can be said that, both group A and group B showed equal improvement in Rotation.

Flexion:

At 8th day, The reduction from baseline in Flexion score for group A (Mean=1.04, Mdn=1) and group B (Mean = 1.09, Mdn = 1) was insignificant (U = 1325, P-value = 0.246) at 5percentage level of significance. Also, the difference in Flexion score from baseline to 15th day for group A (Mean = 1.02, Mdn = 1) and group B (Mean = 1.08, Mdn = 1) was insignificant (U = 1350.5, P-value = 0.460). Therefore, it can be said that, Flexion showed equal improvement for group A and group B.

Tenderness:

At 8th day, The reduction from baseline in Tenderness score for group A (Mean=1.36, Mdn=1) and group B (Mean = 1.51, Mdn = 2) was insignificant (U = 1179.5, P-value = 0.099) at 5percentage level of significance. Also, the difference in Tenderness score from baseline to 15th day for group A (Mean = 1.36, Mdn = 1) and group B (Mean = 1.51, Mdn = 2) was insignificant (U = 1179.5, P-value = 0.099). Therefore, it can be said that, Tenderness was equally improved with both group A and group B.

OLB score:

At 8th day, The reduction from baseline in Pain score for group A (Mean=19.64, Mdn=20) and group B (Mean = 19, Mdn = 18) was insignificant (U = 1411, P-value = 0.970) at 5percentage level of significance. Also, the difference in Pain score from baseline to 15th day for group A (Mean = 19.45, Mdn = 18) and group B (Mean = 18.36, Mdn = 18) was insignificant (U = 1517, P-value = 0.477). Therefore, it can be said that, pain was equally reduced with both group A and group B.

Effect of pinda sweda and nidasweda in Katishoola:

The pinda sweda has shown significant improvement in all the parameters as before treatment and after treatment. Also the improvement was persisting till follow-up in all the parameters. The nadi sweda has shown significant improvement in all the parameters as before treatment and after treatment. Also the improvement was persisting till follow-up in all the parameters except OLB score. In OLB score effect of therapy was declining till follow-up in comparison with after treatment but not raised upto as that of before treatment.This denotes that the both sweda are beneficial in reducing pain and improving range of movement in katishoola. The post treatment effect of swedan is persisting in all aspects in pinda sweda. In nadi sweda the post treatment effect persisting in improving range of movement. Nadi sweda reduces pain during treatment whereas in post treatment period pain occurs to some extent but not as equal to before treatment.

Here nadi sweda is bashpa snigdha sweda which does vata shaman, snayu mamsa mruduta whereas patrapinda is snigdha sankar sweda which does vata shaman, snayu mamsa mruduta, snigdhata and dridhikaran by these properties pinda sweda is improves the strength of a body component better than that of nadi sweda, hence the effect of patrapinda is persisting than that of nadi sweda.

In comparison nadi sweda shown a higher reduction in schobers test than treated pinda sweda.Here as nadi sweda is bashpa sweda it improves the circulation faster and reducing the spasticity.whereas in patrapinda sweda quantum of heat application is less as compare to that of nadi sweda.By virtue of these points nadisweda is improving the movement earlier than the pinda sweda.

Onset of swedna lakshanas : -

The sheeta Vyuparam was observed at first day itself for all patients in both group A and group B, thus as both groups can be considered as essentially same in reference to observance of Sheeta Vyuparam.

The Shool vyuparam was observed significantly earlier (U = 2470, P-value < 0.001) for group B (Mean = 2.08 days, Mdn = 2 days , IQR = 1 day) than it observed for group A (Mean = 3.58 days, Mdn = 3 days, IQR = 1 day). Thus we can say that, group B showed shool vyuparam lakshana in significantly less time than group A.

Time required to observe Stambhanigrapha for group A (Mean = 2.19 days, Mdn = 2 days, IQR = 1 day) was significantly lower (U = 608, P-value < 0.001) than

time taken by group B (Mean = 3.40 days, Mdn = 3 days, IQR = 2 days). So we can say that group A has significantly early occurrence of Stambhanigraha lakshana as compared to group B.

For group A, time required for observance of Gourav nigraha (Mean = 1.89 days, Mdn = 2 days, IQR = 1 day) was significantly lower (U = 1001, P-value = 0.008) than time required for group B (Mean = 2.45 day, Mdn = 2 day, IQR = 1 day) at 5percentage level of significance. Thus we can say that, group A has significantly early occurrence of Gourav nigraha than group B.

The Sweda strav was observed at first day itself for all patients in both group A and group B, thus as both groups can be considered as essentially same in reference to observance of Sweda strav.

Time required for observance of Vyadhihani for group A (Mean = 3.74 days, Mdn = 4 days, IQR = 2 days) and time required for group B(Mean = 3.55 days, Mdn = 3 days, IQR = 3 days) was not significantly different (U = 1530.5, P-value = 0.414) at 5percentage level of significance. Thus we can say that, group A and group B took equal time for the onset of Vyadhihani.

For group A, time required for observance of Laghutva (Mean = 1.94 days, Mdn = 2 days, IQR = 1 day) was significantly lower (U = 1001, P-value = 0.008) than time required for group B (Mean = 2.40 days, Mdn = 2 days, IQR = 2 days) at 5percentage level of significance. Thus we can say that, group A has significantly early occurrence of Laghutva than group B.

Probable Mode of Action:

- The vata dosha get vitiated in katishool, the swedana procedure pacifies the vata dosha.
- The swedana procedure strengthen the structure of kati such as snayu, peshi because of which the the pain sensation ceases.
- The nirgundi by virtue of its ushna veerya pacifies the vatadosha, and also it possesess vedanasthapan and shulaahar properties.
- Aacharya Vagbhata stated that the administration of ushnopachar with snigdhadi guna mitigate the vata dosha, here the the vitiated vata pacified by application of snigdhadi guna (abhyanga) followed by ushnopachar(swedana and nirgundi ushna veerya.)

- The aromatic substances are helpful to relieve the pain. The leaves of nirgundi contain volatile oils. In swedana procedure the heat application to nirgundi patra liberates the volatile oils and gets applied over affected part by which it helps to reduce the pain.
- Diffusion through the skin is a temperature dependent process (According to Kligman), so raising the skin temperature will enhance the transdermal delivery of drugs by enhancing blood vessel wall permeability,drug solubility, skin permeability, body fluid circulation. External heating will dilate the penetration pathways in the skin, increases kinetic energy and movement of particles in the treated area leading to improve drug absorption.
- Consequent application of therapeutic heat causes vasodilation, because of which the blood circulation improves, results in removal of catabolic waste such as lactic acid.
- As the blood circulation improves the anabolism increases as tissues receives the nutrients and oxygen promptly. Because of this the muscles supporting the lumbar spine get strengthen. So pressure gradient on lumbar spine get reduced.
- Thermal and pain signals are located in skin parallel to each other. Among these two sensation the stronger one is received, which is thermal (heat) sensation and pain sensation ceases.
- Swedana reduces pain by inhibiting the nociceptive system which mediates the pain. Due to its hyperaemic effect it causes the dilation of the arterioles and thereby increases circulation. The venous and lymphatic circulations are improved.
- Here the Hilton's Law can be applied in understanding the action of swedana, which says that the nerve which supplies a joint also supplies group of muscles acting over those joints and skin. Usually in joint disorders there is a contraction of the nerve reflex to fix the joint in a comfortable position. This also causes a referred pain over the skin in that area covered. Therefore swedana relieves the pain & relaxes the muscle acting on the joint.

Role of Abhyanga:

- The abhyanga is vatashamak, and strengthen the tissue(dardhyakrut)
- The abhyanga performed during the procedure is advantageous in relieving shoola and stambha. It also creates the pressure gradient necessary for the absorption of the sneha amsha. By stimulating the sensory nerve endings it relaxes the muscles & its related structures.

Effects of heat:

Increased metabolism

The metabolism is more where most heat is produced, which is in the superficial tissues. As a result of the increased metabolism there is an increased demand for oxygen and nutrients, and an increased output of waste products.

- **Increased blood supply**

As a result of increased metabolism, the output of waste products from the cells is increased. These include metabolites, which act on the walls of the capillaries and arterioles causing dilatation of these vessels. In addition, the heat has a direct effect on the blood vessels, causing vasodilatation, particularly in the superficial tissues where the heating is greatest. Stimulation of superficial nerve endings can also cause a reflex dilatation of the arterioles. As a result of vasodilatation there is an increased flow of blood through the area hence receiveing the nutritive materials and waste products are removed.

- **Effects of heating on nerves**

Heat appears to produce definite sedative effects. That has been applied as a counter irritant, which is the thermal stimulus, may effect the pain sensation as explained by the gate theory of Melzack and Wall.

Indirect effects of heating

o Muscle tissue – increase in temperature results into muscle relaxation and improves the efficiency of muscle action, as the increased blood supply ensures the optimum conditions for muscle contraction.

o Increased activity of sweat glands – There is reflex stimulation of the sweat glands in the area exposed to the heat, resulting from the effect of the heat on the sensory nerve endings.

Comparative mode of action of swedana against conventional treatment:

NSAID:

Table no. 88: mode of action of swedana against NSAID

	NSAID	SWEDANA
Decrease inflammation	Decrease the inflammation and reduce the pain	Decrease the inflammation and reduce the pain
Strength of muscle	Does not improve the strength of muscle	Improves the strength of muscle
Spasm	Relieve the muscle spasm	Relieve the muscle spasm
Local blood circulation	Does not improve	Improve
Adverse effect	Acidity, adverse effect on vital organs.	Occurs if Swedana atiyoga

Exercises:

Table no.89: mode of action of swedana against exercise.

	Exercise	SWEDANA
Strength	increase the strength back.	Increase the strength back.
Stress on back	relieves the stress on back	relieves the stress on back
Disc	pump the disc and increase water content	----
Facet joint	stretches and mobilizes the facet joint	----
Local blood circulation	Does not improve	Improve

Traction:

Table no. 90: mode of action of swedana against traction

	Traction	SWEDANA
Muscle spasm	It relieves the muscle spasm	It relieves the muscle spasm
Facet joint and disc space	distracts the facet joint and disc space and helpful in relieving pain.	Does not distract
Decrease inflammation	Does not reduce the inflammation	Decrease the inflammation and reduce the pain
Inflammatory protein	Does not flush out inflammatory proteins.	Flushes out inflammatory proteins and reduce the pain
Local blood circulation	Does not improve	Improve

Muscle relaxant

Table no. 91: mode of action of swedana against muscle relaxant

	Muscle relaxant	SWEDANA
Decrease inflammation	Decrease the inflammation and reduce the pain	Decrease the inflammation and reduce the pain
Strength of muscle	Does not improve the strength of muscle	Improves the strength of muscle
Spasm	Relieve the muscle spasm	Relieve the muscle spasm
Local blood circulation	Improve	Improve
Adverse effect	Occurs occasionaly.	Occurs if Swedana atiyoga

Epidural steroids:

Table no. 92: mode of action of swedana against epidural steroids

Mode of action	Epidural steroids	SWEDANA
Decrease inflammation	Decrease the inflammation and reduce the pain	Decrease the inflammation and reduce the pain
Inflammatory protein	Flushes out inflammatory proteins and reduce the pain	Flushes out inflammatory proteins and reduce the pain
Strength of muscle	Does not improve the strength of muscle	Improves the strength of muscle
Spasm	Does not relieve the muscle spasm	Relieve the muscle spasm
Local blood circulation	Does not improve	Improve
Adverse effect	infection, dural puncture, arachniditis.	Occurs if Swedana atiyoga

7. CONCLUSION

- Group A treated with nirgundi patra pinda sweda has shown significant improvement in all the parameters as before treatment and after treatment. Also the improvement was persisting till follow-up in all the parameters.
- Group B treated with nirgundi patra nadi sweda has shown significant improvement in all the parameters as before treatment and after treatment. Also the improvement was persisting till follow-up in all the parameters except OLB score. In OLB score effect of therapy was declining till follow-up in comparison with after treatment but not raised upto as that of before treatment.

  Here nadi sweda is bashpa snigdha sweda which does vata shaman, snayu mamsa mruduta whereas patrapinda is snigdha sankar sweda which does vata shaman, snayu mamsa mruduta, snigdhata and dridhikaran therefore the effect of patrapinda is persisting than that of nadi sweda.
- In comparative analysis group B treated with nirgundi patra nadi sweda showed higher reduction in schobers test than treated with Group A with nirgundi patra pinda sweda.

  Here as nadi sweda is bashpa sweda it improves the circulation faster and reducing the spasticity.whereas in patrapinda sweda quantum of heat application is less as compare to that of nadi sweda.
- Lateral flexion, rotation, tenderness and flexion showed equal improvement in both groups.
- Statistically in comparative analysis OLB score has shown equal improvement in both the groups.
- Hence nirgundi exerts a shoolahara property in both the forms as pinda sweda and nadi sweda. But as in within group analysis the nadi sweda is having declining effect whereas pindasweda is having persisting effect till follow-up.
- As shoolvyuparam observed earlier in nadisweda whereas stambhanigraha, gouravanigraha, laghutwa observed earlier for pinda sweda this denotes the strength of two sweda differs at certain instances.

Assessment of swedana laxanas:

- Among all the parameters of swedana Sheetavyuparama and swedasrava observed since first day.
- Shoolavyuparama observed significantly earlier for nadisweda than pindasweda.
- Stanbhanigraha, gouravanigraha and laghutva observed significantly earlier for pindasweda than nadisweda.
- Both swedana procedure required equal duration for the onset of vyadhihani.

Scope for further study:

- Further study can be carried out to assess the role of unwholesome ahar vidhi in katishoola.
- Assessment of shoolahara properties of pinda sweda and nadi sweda in kaphanubandha katishoola.
- Assessment of shoolahara properties of pinda sweda and nadi sweda in aamasansarga, katishoola.

8. SUMMARY

This dissertation entitled - “Comparative study of effect of nirgudi patra pinda sweda and nadisweda in katishool ” comprises of six parts viz. Introduction, Literary review, Materials and Methods, Discussion, Conclusion and summary.

Introduction: This section narrated the need and scope for the study and the rationality behind selecting the procedure and objectives of the study.

Literary review is subdivided into 3 sections viz. disease review, drug review and procedure review.

Procedure review: In this section the historical review, historical aspect on swedana, vyutpatti, nirukti, and paribhasha. It also gives the classifications according to various Acharyas, indications, contraindications, arhas, anarhas, samyak, ayoga and atiyoga of swinna laxanas.

Disease review: Disease review includes historical review, vyutpatti, nirukti, paribhasha,rachana shaareera, nidana, samprapti, poorvaroopa, roopa, upashaya anupashaya. A brief discussion based available modern literature on the above subjects were also done with reference to low backache.

Drug review: In this section Botanical name, Family, Rasa, Guna, Veerya, Vipaka, Doshaghnata, Rogaghnata and Karma of nirgundi is described.

Materials & Methods: Description regarding the Source of data, criteria of selection of patients, details of diagnostic, inclusion and exclusion criteria, Research design, Methodology of study and assessment criteria for assessing the effects of the therapy and duration of the trial have been explained.

Observations & Results: Thereafter general observations of the 106 patients of katishoola studied and are presented in tabular form along with brief description of each finding and graphs. In the end the results along with statistical analysis of the results obtained are interpreted.

Discussion: In this study a total of 106 patients suffering katishoola studied. The discussion has been done on each section of the dissertation separately. The precious points of discussion includes application of the anukta vyadhi principle and discussion about samyaka swedana laxanas.

Conclusion: This section includes the conclusion made on different aspects, review, observations, statistical analysis and important findings of this study.

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9.2 CASE PROFORMA (Group A - Pinda sweda)

Name of the patient:- Date:

Age:- OPD NO./ IPD NO.

Sex:-
Religion:-
Address:-

Educational Status:-P/HS/G/PG

Occupation:-

Socio economic status:-Poor/Lower middle class/Upper middle class/Rich

Marital status:-Unmarried/Married/Divorcee/Widow/Widower

Chief complaints:- Duration:-

Associated complaints: - Duration:-

History of Present illness:-

History of Past illness:-

Family History:-

Treatment History:-

Personal History:-

Menstrual History:-

Obstetric History:-

Dasha Vidha Atura Pareeksha

Prakrititaha:-

Sarataha:- Pravara/ Madhyama/ Avara

Samhananataha:-Susamhata/ Madhyama/ Asamhata

Pramanataha:-Sama/ Adhika/ Heena

Satmyataha:-Ekarasa/ sarvarasa/Vyamishra

Satvataha:-Pravara/ Avara/ Madhyama

Ahara Shakti:-Abhyavarana :-Pravara/ Madhyama/ Avara

Jarana Shakti:-Pravara/ Madhyama/ Avara

Vyayama Shakti:-Pravara/ Madhyama/ Avara

Vayataha:-

Vikrititaha:

General Examinations:-

Built:-	Nourishment:-
PulseRate: -	Respiratory rate:-
Weight: -	Blood pressure:-
Height: -	Lymph nodes;-

Systemic Examination:-

Respiratory System :-

Cardio vascular System:-

Gastro intestinal System:-

Central nervous System:-

Locomotor system:-

Examination of Spine:

Inspection:(scar, wound, swelling)

Posture:
Range of Movement:
Flexion:
Extension:
Lateral Flexion:
Rotation

Palpation: Tenderness.

Laboratory Investigation;- Blood Investigation

Hb% T C DC

ES R R B S

Urine Analysis;-

Routine:

Microscopic:

X-ray: LS spine
AP and LAT View:

CHIKITSA VIDHI

Group A: Will undergo for Pinda sweda

Purvakarma: ♦ Preparation of nirgundi patra pind.

♦ Proper positioning of patient

♦ Abhyanga to katipradesha

Pradhan karma: ♦ Application of warm patra pind over kati pradesha.

Sl. no	Lakshana	1	2	3	4	5	6	7
1	Sheetha vyuparama							
2	Shoola vyuparama							
3	Sthambhanigraha							
4	Gouravanigraha							
5	Swedasrava							
6	Vyadhihani							
7	Laghutva							

Paschat karma: Cleanly wipe off the katipradesha.

Precaution: care should be taken to avoid burns.

Assessment criteria:

Schober's Test

Criteria	Grading	Before	8thday	15thday
Flexion up to 5 cm	0			
Flexion up to 3 cm	1			
Flexion up to 2 cm	2			
Flexion <1 cm	3			

Lateral Flexion

Criteria	Grading	Before	8thday	15thday
Can do lateral flexion easily	0			
Can lateral flex with difficulty.	1			
Cannot perform lateral flexion	2			

Rotation

Criteria	Grading	Before	8thday	15thday
Can rotate easily	0			
Rotation with difficulty	1			
Cannot rotate	2			

Flexion

Criteria	Grading	Before	8thday	15thday
Can do flexion easily	0			
Can flex with difficulty	1			
Cannot perform flexion	2			

Tenderness

Criteria	Grading	Before	8thday	15thday
No Pain	0			
Patients says its paining	1			
Patient winces	2			
Patients winces and withdraws the part	3			
Patient does not allow to touch the part	4			

♦ **Pain**

Oswestry Low Back Pain Score - Orthopaedic Scores

Before	8^{th} day	15^{th} day

Investigator Note:

Signature of the Ph.D. scholar Signature of the guide

9.3 CASE PROFORMA(Group B- Nadi sweda)

Name of the patient:- Date:

Age:- OPD NO./ IPD NO.

Sex:-
Religion:-
Address:-

Educational Status:-P/HS/G/PG

Occupation:-

Socio economic status:-Poor/Lower middle class/Upper middle class/Rich

Marital status:-Unmarried/Married/Divorcee/Widow/Widower

Chief complaints:- Duration:-

Associated complaints: - Duration:-

History of Present illness:-

History of Past illness:-

Family History:-

Treatment History:-

Personal History:-

Menstrual History:-

Obstetric History:-

Dasha Vidha Atura Pareeksha

Prakrititaha:-

Sarataha:- Pravara/ Madhyama/ Avara

Samhananataha:-Susamhata/ Madhyama/ Asamhata

Pramanataha:-Sama/ Adhika/ Heena

Satmyataha:-Ekarasa/ sarvarasa/Vyamishra

Satvataha:-Pravara/ Avara/ Madhyama

Ahara Shakti:-Abhyavarana :-Pravara/ Madhyama/ Avara

Jarana Shakti:-Pravara/ Madhyama/ Avara

Vyayama Shakti:-Pravara/ Madhyama/ Avara

Vayataha:-

Vikrititaha:

General Examinations:-

Built:-	Nourishment:-
PulseRate: -	Respiratory rate:-
Weight: -	Blood pressure:-
Height: -	Lymph nodes;-

Systemic Examination:-

Respiratory System :-

Cardio vascular System:-

Gastro intestinal System:-

Central nervous System:-

Locomotor system:-

Examination of Spine:

Inspection:(scar, wound, swelling)

Posture:
Range of Movement:
Flexion:
Extension:
Lateral Flexion:
Rotation

Palpation: Tenderness.

Laboratory Investigation;- Blood Investigation

Hb% T C DC

ES R R B S

Urine Analysis;-

Routine:

Microscopic:

X-ray: LS spine
AP and LAT View:

CHIKITSA VIDHI

Group B: Will undergo for Nadi sweda

Purvakarma: ♦ Preparation of nirgundi patra decoction.

♦ Proper positioning of patient.

♦ Abhyanga to katipradesha.

Pradhan karma: ♦ Application of vapours of decoction over kati pradesha.

♦ Till getting samyaka swinna laxanas.

Sl. no	Lakshana	1	2	3	4	5	6	7
1	Sheetha vyuparama							
2	Shoola vyuparama							
3	Sthambhanigraha							
4	Gouravanigraha							
5	Swedasrava							
6	Vyadhihani							
7	Laghutva							

Paschat karma: Cleanly wipe off the katipradesha.

Precaution: care should be taken to avoid burns.

Assessment criteria:

Schober's Test

Criteria	Grading	Before	8th day	15th day
Flexion up to 5 cm	0			
Flexion up to 3 cm	1			
Flexion up to 2 cm	2			
Flexion <1 cm	3			

Lateral Flexion

Criteria	Grading	Before	8th day	15th day
Can do lateral flexion easily	0			
Can lateral flex with difficulty.	1			
Cannot perform lateral flexion	2			

Rotation

Criteria	Grading	Before	8th day	15th day
Can rotate easily	0			
Rotation with difficulty	1			
Cannot rotate	2			

Flexion

Criteria	Grading	Before	8th day	15th day
Can do flexion easily	0			
Can flex with difficulty	1			
Cannot perform flexion	2			

Tenderness

Criteria	Grading	Before	8th day	15th day
No Pain	0			
Patients says its paining	1			
Patient winces	2			
Patients winces and withdraws the part	3			
Patient does not allow to touch the part	4			

♦ **Pain**

Oswestry Low Back Pain Score - Orthopaedic Scores

Before	8^{th} day	15^{th} day

Investigator Note:

Signature of the Ph.D. scholar Signature of the guide

9.4 संमती पत्रक

मी खालील संपूर्ण माहिती वाचली आहे, (किंवा मला वाचून दाखवली आहे.) माझ्या सर्व प्रश्नांची समाधानकारक उत्तरे मिळाली आहे. माझे वय १८ वर्षापेक्षा जास्त असून मी संमती प्रदान करत आहे, माझा यासाठी अंतर्भाव करण्यात यावा.

१. मी संपूर्ण माहिती वाचली असून मला समजली आहे.

२. संमती पत्रक मला समजावून सांगितले आहे.

३. मला चिकित्सेचे स्वरूप स्पष्ट केले आहे.

४. माझी कर्तव्ये मला समजावून सांगितले आहे.

५. चिकित्सेतील संभाव्य धोके समजावून सांगितले आहे.

६. मी चिकित्सकांना घेत असलेल्या सर्व औषधोपचाराची माहिती दिली आहे.

७. चिकित्सकांना पूर्ण सहकार्य करेन तसेच काही त्रास झाल्यास त्यांना तात्काळ सूचित करेन.

८. माझी ओळख गोपनीय ठेवली जाईल जरी माझी वैद्यकीय माहिती प्रसिध्द होत असेल.

९. माझ्या सर्व प्रश्नांची समाधानकारक उत्तरे मिळाली आहेत.

रूग्णाची सही :–

रूग्णाचे नांव :–

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CERTIFICATE OF ANALYSIS

NARL/ P-391			24/06/2013
Name/ Organisation	Dr.Ravikumar Bhagwan Patil,Shiroli		
Sample Description	Nirgundi Leaves		
Sample collected by	Party	Sample Received on	22/06/2013
Sample Analysed by	Mrs. Vinaya	Analysis Completed on	24/06/2013
Reference			

Authentification Certificate

We have studied exomorphically and organoleptically the sample submitted by the Dr.Ravikumar Bhagwan Patil,Shiroli

We hereby authenticate that the sample belongs to the leaves of *Vitex negundo* Linn. (Nirgundi-Leaf). Family – Verbenaceae as per Ayurvedic pharmacopy.

The certificate is issued at his request and given only for academic use.

For

Analyst / Lab In-Charge

Managing Director

Nikhil Suhas Khambe

B.Tech (Bio-tech)

JAS-ANZ

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9.6 Oswetry low back score - orthopaedic score In regional language.

Pain intensity	Before	After	Follow up
वेदना नाही.			
थोडी वेदना जाणवते.			
वेदना थोडी तीव्र आहे.			
वेदना तीव्र आहे.			
वेदना जास्त तीव्र आहे.			
वेदना असहय आहे.			

Persnol care वैयक्तीक काळजी (कपडे घालणे)	Before	After	Follow up
मी स्वतःची काळजी घेऊ शकतो.			
स्वतःची कामे करताना वेदना जाणवतात परंतू हळूवारपणे काळजी घेतो.			
मी स्वतःची काळजी घेऊ शकतो परंतू वेदना जाणवते.			
थोडी मदत लागते परंतू मी माझी कामे करू शकतो.			
प्रत्येक कामात इतरांची मदत घ्यावी लागते.			
माझी स्वतःची कामे करू शकत नाही.			

Lifting उचलणे	Before	After	Follow up
जमिनीवरील जास्त वजनाच्या वस्तू उचलू. शकतो.			
जास्त वजनाच्या वस्तू वेदना न जाणवता उचलू शकता			
जास्त वजनाच्या उचलू शकतो पण वेदना जाणवते.			
शकत नाही परंतू टेबलावरील उचलू शकतो.			
परंतू टेबलावरील कमी वजनाच्या वस्तू उचलू शकतो. हलक्या वस्तू उचलू शकतो.			
काहीही उचलू शकत नाही घेऊन जाऊ शकत नाही.			

Sitting बसणे	Before	After	Follow up
खुर्चीमध्ये कितीही वेळ बसू शकतो.			
ठराविक खुर्चीमध्ये कितीही वेळ बसू शकतो.			
१ तासामध्ये जास्त वेळ बसू शकत नाही.			
१/२ तासापेक्षा जास्त वेळ बसू शकत नाही.			
१० मिनीटापेक्षा जास्त वेळ बसू शकत नाही.			
अजिबात बसू शकत नाही.			

Standing उभे राहणे	Before	After	Follow up
कितीही वेळ उभा राहू शकतो.			
कितीही वेळ उभा राहू शकतो परंतू वेदना जाणवते.			
१ तासापेक्षा जास्त वेळ उभा राहू शकत नाही.			
१/२ तासापेक्षा जास्त वेळ उभा राहू शकत नाही.			
१० मिनीटापेक्षा जास्त वेळ उभा राहू शकत नाही.			
अजिबात उभा राहू शकत नाही.			

Sleeping झोपणे	Before	After	Follow up
वेदनेमुळे झोप कधीही खंडित होत नाही.			
वेदनेमुळे झोप कधीही खंडित होते.			
वेदनेमुळे ६ तासा पेक्षा कमी झोप लागते.			
वेदनेमुळे ४ तासा पेक्षा कमी झोप लागते.			
वेदनेमुळे २ तासा पेक्षा कमी झोप लागते.			
वेदनेमुळे अजिबात झोप लागत नाही.			

Sex Life वैवाहीक संबंध	Before	After	Follow up
व्यवस्थित आहे कोणताही त्रास जाणवत नाही.			
व्यवस्थित आहे परंतू थोडी वेदना जाणवते.			
व्यवस्थित आहे परंतू खूप वेदना जाणवते.			
संबंधामध्ये वेदनेमुळे अडथळे येतात.			
वेदनेमुळे संबंध जवळपास होऊ शकत नाही.			
वेदनेमुळे संबंध पुर्णता बंद आहे.			

Social Life सामाजीक	Before	After	Follow up
सामाजीक जीवनात काही त्रास नाही.			
सामाजीक जीवन व्यवस्थित आहे परंतू वेदना जाणवतात.			
वेदनेचा सामाजीक जीवनात धावपळीच्या गोष्टी वगळता काही त्रास होत नाही.			
वेदनेमुळे सामाजिक जीवनात अडथळे निर्माण होते.			
वारंवार बाहेर जाऊ शकत नाही.			
समाजिक जीवन घरापुरतेच मर्यादित आहे.			
वेदनेमुळे सामाजिक जीवन नाही.			

Travelling प्रवास	Before	After	Follow up
प्रवासाचा काही त्रास होत नाही कुठेही प्रवास करू शकतो.			
कुठेही प्रवास करू शकतो परंतू थोडी वेदना जाणवते.			
वेदना होतात परंतू 2 तास प्रवास करू शकतो.			
वेदना होतात परंतू 1 तास प्रवास करू शकतो.			
वेदना होतात परंतू 30 मिनिटांमेक्षा जास्त प्रवास करू शकत नाही.			
चिकित्सेला येण्याव्यतिरिक्त वेदनेमुळे कुठेही जाऊ शकत नाही			

Walking (चालणे)	Before	After	Follow up
कितीही अंतर चालू शकतो			
वेदने मुळे 1 मैलापेक्षा जास्त चालु शकत नाही			
वेदने मुळे 1/2 मैलापेक्षा जास्त चालु शकत नाही			
वेदने मुळे 100 यार्डपेक्षा जास्त चालु शकत नाही			
काठीचा आधार घेऊ शकतो			
आथरूणावर अधिक वेळ असतो			

9.7 Satmyata , Pramanata etc nine factor explanation.

These tems are from samhita.

These examination performed by darshan pariksha, sparsha pariksha, prashna pariksha and anuman praman, in concern with the parameters given in samhita.

The points included in case proforma under dashavidha pariksha.

Purpose: These parameters have been selected for the retrospective purpose, to understand that in katishoola what could be proportionate of these nine parameter and to get their demographic data .

Their assessment done as follows.

Parameter	Assessment
Satmya	Ekarasa, vyamishra, sarvarasa
Satva	Prashna pariksha,
Sarataha	Darshana , prashna pariksha
samhanataha	Darshana pariksha
Aahar shakti	Prashna pariksha,
Jaran shaktti	Prashna pariksha, Anuman
Vyayam shakti	Prashna pariksha, anuman praman
Pramanat	Ayam vistar, darshan pariksha
Vayatah	As per age

Name	Age	sex	chief complaint duration	Prakrititaha	Xray						Assessment of swedana laxana							schobers Test			lateral flexion			Rotation
Pinda sweda					Normal lum lord	Bone mineralization	Disc Space	facetal arth	Degenerati	Bony lumb	Shee	Shool vyup	Stambhani	Gourav nig	sweda stra	Vyadhihani	Laghutva	Before	8 Day	15 Day	Before	8 Day	15 Day	Before
Somanna Boragi	60	M	6 months	VK	Reduced	Decreased	L3-L4 Reduced	Present	Present	Normal	1	4	3	1	1	6	1	2	1	1	2	1	1	2
Sarita Kachare	32	F	one year	PK	Reduced	mild osteopenia	maintained	Absent	Absent	Normal	1	4	2	1	1	6	1	2	0	0	1	0	0	1
Ramesh Nakate	50	M	6 months	pk	Reduced	mild osteoporosis	L5-S1 Reduced	Absent	Present	Normal	1	4	2	1	1	6	1	3	1	1	2	0	0	2
Arun Kadam	29	M	one year	vp	Reduced	mild osteoporosis	maintained	Absent	Absent	Normal	1	3	2	2	1	5	2	2	0	0	1	0	0	1
Vishwanath Mali	42	M	8 months	vk	lost, straightening of spine	mild osteoporosis	maintained	Absent	Present	Normal	1	4	2	3	1	4	3	1	0	0	1	0	0	1
Anita patil	43	f	8 months	pk	Reduced	mild osteoprosis	maintained	Absent	Absent	Normal	1	4	2	2	1	5	1	2	0	0	1	0	0	1
Ujjwala Mohite	26	F	9 months	vk	Reduced	normal mineralization	L5-S1 Reduced	Absent	Absent	Normal	1	4	2	2	1	4	2	1	0	0	1	0	0	1
Aasama Nadaf	25	F	one year	vp	maintained	normal mineralization	maintained	Absent	Absent	Normal	1	5	3	3	1	5	7	1	0	0	1	0	0	1
dattatraya sawant	31	M	8 months	vk	Reduced	normal mineralization	maintained	Absent	Absent	Normal	1	5	2	2	1	5	2	3	1	1	2	1	1	2
nirmala ranade	60	F	7 year	pk	exaggarated	mild osteoporosis	maintained	Present	Absent	Normal	1	6	4	3	1	6	3	1	0	0	1	0	0	1
jayant shinde	55	M	2year	vk	Reduced	normal mineralization	L5-S1 Reduced	Absent	Present	narrow L4 I	1	4	2	2	1	4	2	2	1	1	2	1	1	2
Chandrakant Rawal	63	m	5 year	vp	maintained	normal mineralization	maintained	Absent	Absent	Normal	1	5	3	2	1	5	2	2	1	1	1	0	0	1
Raghunath Nikam	55	M	2.5 yr	pv	Reduced	mild ostoporosis	L5-S1 Reduced	Absent	present	narrow l5 l	1	6	4	4	1	6	4	2	1	1	1	0	0	1
Mohan wadagaonka	32	m	5 months	vp	maintained	normal mineralization	maintained	Absent	Present	Normal	1	5	3	2	1	5	2	1	0	0	1	0	0	1
Dhanaji Mhaske	29	M	8 months	vp	lost, straightening of spine	normal mineralization	maintained	Absent	Absent	Normal	1	5	3	2	1	5	2	2	0	0	1	0	0	1
Geeta khot	29	F	one year	pk	exaggarated	normal mineralization	L2L3,L5-S1 reduced	Absent	Present	Normal	1	5	3	2	1	5	2	1	0	0	1	0	0	1
Manoj Lavate	50	M	2.5 years	vp	Reduced	mild osteoporosis	L5-S1 Reduced	Absent	Present	Normal	1	4	3	3	1	4	3	2	1	1	1	0	0	1
Ram Mane	58	M	6 months	vp	maintained	mild osteoporosis	L5-S1 Reduced	Absent	Present	narrow l5 l	1	4	3	2	1	4	2	1	0	0	1	0	0	1
Prafulla Patil	50	M	7 months	vk	Reduced	milid osteoporosis	L5-S1 Reduced	Absent	Present	Normal	1	4	3	3	1	4	3	1	0	0	1	0	0	1
Mumtaj Mulani	60	f	6 months	pk	exaggarated	mild osteoporosis	L5-S1 Reduced	Absent	Present	narrow l5 l	1	4	3	3	1	4	3	2	1	1	1	0	0	1
Shivraj Patil	20	M	5 months	vp	exaggarated	normal mineralization	L5-S1 Reduced	Absent	Present	Normal	1	4	2	2	1	4	2	1	0	0	1	0	0	1
Tarabai Londhe	59	F	2.5 years	vp	exaggarated	Decreased	maintained	Absent	Present	Normal	1	5	3	3	1	5	3	2	1	1	1	0	0	1
Subhash Sarade	58	M	3 year	pv	Reduced	Decreased	L5-S1 Reduced	Absent	Present	Narrow L 5	1	4	3	2	1	4	2	1	0	0	1	0	0	2
Sagar Chavan	25	M	8 months	vp	Reduced	normal mineralization	maintained	Absent	Absent	Normal	1	4	3	3	1	4	3	1	0	0	1	0	0	1
Vimal Sokashi	55	F	2 yrs	vp	Reduced	Decreased	L5-S1 Reduced	Absent	Present	narrow l5 l	1	4	3	3	1	4	3	3	1	1	1	0	0	1
Akshay Kale	35	M	8 months	vk	exaggarated	normal mineralization	L5-S1 Reduced	Absent	Present	Normal	1	4	2	2	1	4	2	1	0	0	1	0	0	1
Pradeep Patil	22	M	8 months	pk	Reduced	normal mineralization	L5-S1 Reduced	Absent	Absent	Normal	1	3	3	2	1	3	2	1	0	0	1	0	0	1
Gopal Chopade	40	M	9 months	vk	maintained	normal mineralization	maintained	Absent	Present	Normal	1	4	3	3	1	4	3	2	0	0	1	0	0	1
Godavari Patil	45	f	7 months	pk	maintained	normal mineralization	maintained	Absent	Absent	Normal	1	3	1	1	1	3	1	3	1	1	1	0	0	1
Satish Pokharnikar	34	m	2 yrs	pk	Reduced	normal mineralization	maintained	Absent	Absent	Normal	1	3	3	2	1	3	2	3	1	1	1	0	0	1
vijay shinde	45	m	6 months	vp	Reduced	normal mineralization	L5-S1 Reduced	Absent	Present	Normal	1	2	2	1	1	2	1	2	1	1	1	0	0	1
Nandini Kamble	35	F	8 months	vp	exaggarated	mild osteoporosis	L5-S1 Reduced	Present	Present	Normal	1	3	2	2	1	3	2	2	1	1	2	1	1	2
Bilal Attar	60	f	8 months	vp	exaggarated	Decreased	maintained	Absent	Present	Normal	1	3	2	2	1	3	2	2	1	1	1	0	0	1
Shobha javade	35	f	5 months	vp	exaggarated	mild osteoporosis	L5-S1 Reduced	Present	Present	Normal	1	2	1	1	1	2	1	2	1	1	2	1	1	1
Chandabai More	56	f	1 yr	pk	Reduced	mild osteoporosis	L2L3,L5-S1 reduced	Absent	Present	Normal	1	3	2	2	1	3	2	2	0	0	1	0	0	1
Janabai Gore	49	f	10 months	pk	maintained	Decreased	l3-L4 L4-5, L5 S1 Reduc	Absent	Present	narrow l5 l	1	3	1	1	1	3	1	1	0	0	1	0	0	1
Yashawant Shinde	21	M	1 yr	pk	Reduced	mild osteoporosis	maintained	Absent	Present	Normal	1	3	2	2	1	2	2	2	0	0	1	0	0	1
Ganapati Deshamar	35	M	3 yr	vk	exaggarated	normal mineralization	L5-S1 Reduced	Absent	Present	Normal	1	3	2	1	1	3	1	1	0	0	1	0	0	2
Aruna Jannar	35	F	1 yr	vp	Reduced	normal mineralization	L5-S1 Reduced	Absent	Present	Normal	1	3	2	2	1	3	2	2	0	0	1	0	0	1
Sheetal Patil	35	F	1.5 yrs	pk	Reduced	normal mineralization	maintained	Absent	Absent	Normal	1	3	1	1	1	3	1	2	0	0	1	0	0	1
Shantabai Kharat	48	F	9 months	vp	Reduced	mild osteoporosis	L5-S1 Reduced	Absent	Present	Normal	1	3	2	2	1	3	2	2	1	1	1	0	0	1
Aakaram Aatugade	48	M	7 months	vp	maintained	normal mineralization	L5-S1 Reduced	Absent	Present	Normal	1	2	2	2	1	2	2	1	0	0	1	0	0	1
Sheela Kulkarni	38	f	8 months	pk	exaggarated	mild osteoporosis	L5-S1 Reduced	Present	Absent	Normal	1	2	1	1	1	2	1	2	1	1	1	0	0	1
Minakshi Desai	35	F	6 months	pk	maintained	normal mineralization	L5-S1 Reduced	Absent	Absent	Normal	1	3	1	1	1	3	1	1	0	0	1	0	0	1
Suman Patil	47	F	5 months	pk	Reduced	normal mineralization	maintained	Absent	Present	Normal	1	3	2	2	1	3	2	2	1	1	1	0	0	2
Ulhas Sawant	58	M	2 yrs	vk	Reduced	Decreased	L5-S1 Reduced	Absent	Present	narrow l5 l	1	3	2	1	1	3	1	2	1	1	1	0	0	1
Pranali Shinde	34	F	1.5 yrs	vp	Reduced	normal mineralization	maintained	Absent	Present	Normal	1	3	1	1	1	3	1	2	1	1	2	1	1	1
Sakhubai Kamble	55	F	8 months	vp	exaggarated	mild osteoporosis	L5-S1 Reduced	Absent	Absent	Normal	1	2	1	1	1	2	1	2	1	1	1	0	0	1
Savita Thorat	50	F	4 months	vp	maintained	normal mineralization	maintained	Absent	Present	Normal	1	2	1	1	1	2	1	2	1	1	2	1	1	1
Suresh Sutar	32	M	9 months	vp	Reduced	normal mineralization	maintained	Absent	Absent	Normal	1	3	2	2	1	3	2	2	1	1	1	0	0	1
Aarati Kadam	51	F	1 yr	vk	exaggarated	Decreased	L4-L5, L5-S1 reduced	Absent	Present	Normal	1	3	1	1	1	3	1	2	1	1	2	1	1	2
Shobha Shende	43	f	1.5 yrs	pk	Reduced	Decreased	maintained	Absent	Present	Normal	1	3	1	1	1	3	1	2	1	1	2	0	0	2
Niramal Sathe	41	F	2 yrs	vp	maintained	normal mineralization	maintained	Absent	Present	Normal	1	3	2	1	1	3	1	2	1	1	1	0	0	1

		Flexion			Tenderness			Pain (OLB Score)		
8 Day	15 Day	Before	8 Day	15 Day	Before	8 Day	15 Day	Before	8 Day	15 Day
1	1	1	0	0	2	0	0	31.11	4.4	4.4
0	0	1	0	0	2	1	1	36	4	4
0	0	2	0	0	3	1	1	34	8	8
0	0	1	0	0	2	0	0	18	2	2
0	0	1	0	0	1	0	0	24	0	0
0	1	1	0	0	2	1	1	33.3	13.3	13.3
0	0	1	0	0	2	0	0	24	2	2
0	0	1	0	0	1	0	0	16	2	2
1	1	2	0	0	4	2	2	36	14	16
0	0	1	0	0	1	0	0	22	2	6
1	1	2	1	1	3	1	1	31.11	13.33	11.11
0	0	1	0	0	2	1	1	44.44	6.6	8.8
0	0	1	0	0	2	1	1	28.8	8.8	8.8
0	0	1	0	0	2	1	0	18	2	0
0	0	1	0	0	2	0	1	20	0	4
0	0	1	0	0	1	0	0	12	0	0
0	0	2	1	1	2	1	1	22	4	4
0	0	1	0	0	2	1	1	33.33	11.11	11.11
0	0	1	0	0	1	0	0	15.5	2.2	2.2
0	0	1	0	0	2	1	1	22.22	6.6	6.6
0	0	1	0	0	2	1	1	24.4	8.8	8.8
0	0	1	0	0	3	1	1	33.33	13.33	13.33
1	1	1	0	0	2	1	1	22.22	2.2	2.2
0	0	1	0	0	1	0	0	20	2	2
0	0	2	1	1	2	1	1	33.11	6.6	6.6
0	0	1	0	0	2	1	1	20	2	2
0	0	1	0	0	2	1	1	24.44	8.8	8.8
0	0	1	0	0	2	0	0	24	2	2
0	0	1	0	0	2	1	1	33.3	15.5	15.5
0	0	2	1	1	2	1	1	34	14	14
0	0	1	0	0	2	1	1	30	10	10
1	1	1	0	0	2	1	1	24	8	8
0	0	1	0	0	2	1	1	26.66	13.33	13.33
0	0	1	0	0	3	1	1	38	12	12
0	0	1	0	0	2	0	0	20	2.2	2.2
0	0	1	0	0	1	0	0	24.4	4.4	4.4
0	0	1	0	0	3	0	0	20	0	0
0	0	1	0	0	1	0	0	14	2	2
0	0	1	0	0	1	0	0	20	4	4
0	0	1	0	0	2	0	0	20	2	2
0	0	1	0	0	2	1	1	33.3	4.4	4.4
0	0	1	0	0	1	0	0	18	2	2
0	0	1	0	0	2	1	1	32	12	12
0	0	1	0	0	2	0	0	16	0	2
1	1	1	0	0	3	1	1	28.8	8.8	8.8
0	0	1	0	0	2	1	1	26.6	11.11	11.11
0	0	1	0	0	3	1	1	32	10	10
0	0	1	0	0	2	1	1	26.6	8.8	8.8
0	0	1	0	0	3	1	1	35.5	13.3	13.3
0	0	1	0	0	2	1	1	26	8	8
1	1	1	0	0	2	1	1	22.2	6.6	6.6
1	1	1	0	0	3	1	1	34	18	18
0	0	1	0	0	2	1	1	42.2	17.7	17.7

Name	Age	sex	chief complaint duration		Prakrititaha	Xray						Assessment of swedana	laxana						schobers Test			lateral flexion			Rotation	
NADI SWEDA																										
Kamal Shin	48	f	9 months		kp	maintained	normal mir	L5-S1 Redu	Absent	Present	Normal	1	2	4	1	1	6	1	3	1	1	2	0	0	2	1
Sadashiv Pa	59	m	2 yrs		vp	maintained	Decreased	L5-S1 Redu	Absent	Present	Normal	1	1	2	1	1	2	1	3	1	1	2	0	0	2	0
Shreekant I	58	m	9 months		vk	maintained	normal mir	maintained	Absent	Present	Normal	1	1	3	1	1	5	1	2	0	0	1	0	0	1	0
Shailaja Ko	55	F	9 months		vk	exaggarate	mild osteo	L5-S1 Redu	Absent	Absent	Normal	1	3	5	1	1	5	1	2	0	0	1	0	0	1	0
Bhimrao Ja	60	M	6 months		vp	exaggarate	osteoporos	L5-S1 Redu	Absent	Present	Normal	1	3	5	1	1	5	1	3	1	1	2	1	1	2	1
Vijay Dange	26	M	6 months		vp	Reduced	normal mir	L5-S1 Redu	Absent	Absent	Normal	1	2	5	2	1	6	2	2	0	0	1	0	0	1	0
Swapnali Z	22	F	1.5 yrs		vp	Reduced	normal mir	L5-S1 Redu	Absent	Absent	narrow l5 l	1	2	4	3	1	5	1	2	1	1	1	0	0	1	0
Vijay Kamb	45	M	10 months		pk	Reduced	normal mir	L5-S1 Redu	Absent	Present	Normal	1	3	5	3	1	6	3	2	1	1	2	0	0	1	0
Anita Deva	40	F	6 months		vp	exaggarate	mild osteo	L5-S1 Redu	Absent	Absent	Normal	1	3	4	3	1	4	3	2	1	0	1	0	0	1	0
Uday Padal	40	M	1 yr		vk	maintained	mild osteo	maintained	Absent	Present	Normal	1	2	4	4	1	4	4	2	0	0	1	0	0	1	0
Sangram Pa	45	M	1.5 yrs		vp	Reduced	normal mir	maintained	Absent	Absent	Normal	1	2	5	4	1	3	4	2	0	0	1	0	0	2	0
Anuja Rajm	25	F	8 months		vp	maintained	normal mir	maintained	Absent	Absent	Normal	1	2	4	4	1	5	4	2	0	1	1	0	0	1	0
Rakesh Salu	23	M	5 months		pk	maintained	normal mir	maintained	Absent	Absent	Normal	1	3	4	4	1	4	4	2	1	1	1	0	0	1	0
Swarupa Al	45	F	2 yrs		pk	Reduced	normal mir	L5-S1 Redu	Absent	Present	Normal	1	2	5	4	1	5	4	3	1	1	2	0	0	2	0
Bhimrao Ja	60	M	2 yrs		vp	exaggarate	osteoporos	L5-S1 Redu	Absent	Present	Normal	1	3	5	4	1	5	4	2	0	0	1	0	0	1	0
Shivaji Mad	40	M	6 months		vk	maintained	mild osteo	maintained	Absent	Present	Normal	1	3	4	3	1	5	3	2	1	1	1	0	0	1	0
Hasina Mul	34	F	2 yrs		pk	Reduced	normal mir	maintained	Absent	Present	Normal	1	2	4	4	1	4	4	2	0	1	1	0	0	1	0
Sulochana I	50	F	1.5 yrs		pk	Reduced	mild osteo	L5-S1 Redu	Absent	Present	Normal	1	3	5	4	1	5	4	2	1	1	1	0	0	1	0
Hanmant P	49	M	8 months		vp	Reduced	mild osteo	L5-S1 Redu	Absent	Present	Normal	1	3	4	3	1	4	3	2	1	1	1	0	0	1	0
Shreekant I	60	M	7 months		vp	Reduced	normal mir	L5-S1 Redu	Absent	Present	Normal	1	3	2	2	1	3	2	2	0	0	1	0	0	1	0
Ramchandı	36	M	5 months		kp	exaggarate	normal mir	L5-S1 Redu	Absent	Present	Normal	1	3	2	2	1	3	2	2	0	0	1	0	0	1	0
Salim Shek	28	M	1 yr		pk	Reduced	mild osteo	maintained	Absent	Absent	Normal	1	3	5	4	1	5	4	2	1	1	1	0	0	1	0
Ajit Hirugad	52	M	6 months		vk	maintained	normal mir	l4-l5 reduce	Absent	Present	Normal	1	2	4	3	1	4	3	2	1	1	1	0	0	1	0
Ashok Bage	35	M	1.5 yrs		vk	exaggarate	normal mir	L5-S1 Redu	Absent	Present	Normal	1	2	4	3	1	4	3	2	1	1	2	1	1	1	0
Pramod Lau	42	M	7 months		vp	straighteni	mild osteo	maintained	Absent	Present	Normal	1	3	5	4	1	5	4	2	1	1	1	0	0	1	0
Raghunath	40	M	10 months		pk	Reduced	osteoporos	maintained	Absent	Absent	Normal	1	2	4	4	1	4	4	2	1	1	1	0	0	1	0
Tanaji Paw	38	M	6 months		vp	maintained	mild osteo	maintained	Absent	Present	Normal	1	3	5	4	1	5	4	2	0	0	1	0	0	1	0
Ruksana M	33	F	7 months		vk	Reduced	mild osteo	maintained	Absent	Present	Normal	1	3	4	3	1	4	3	2	1	1	2	1	1	2	1
Varsharani	31	F	6 months		pk	exaggarate	normal mir	L2L3,L5-S1	Absent	Present	Normal	1	2	3	3	1	3	3	2	0	0	1	0	0	1	0
Anita Shind	31	F	7 months		pk	Reduced	normal mir	maintained	Absent	Present	Normal	1	1	3	2	1	3	2	2	1	1	2	1	1	1	0
Balaso Pati	45	M	1 yr		vk	straighteni	mild osteo	maintained	Absent	Present	Normal	1	2	3	1	1	3	1	3	1	1	1	0	0	1	0
Krishnaji Pa	65	M	2.5 yr		pk	exaggarate	mild osteo	maintained	Absent	Present	narrow l5 l	1	1	2	2	1	2	1	2	1	1	2	1	1	1	0
Vishwas Su	55	M	1.5 yrs		pk	Reduced	mild osteo	L4-L5, L5-S1	Present	Present	narrow l5 l	1	2	3	3	1	3	3	2	1	1	2	1	1	2	1
Swarupa Ha	40	F	7 months		pk	exaggarate	mild osteo	L5-S1 Redu	Present	Present	Normal	1	2	2	2	1	2	2	3	1	1	2	1	1	2	1
Vilas Ghora	58	M	6 months		vp	maintained	mild osteo	l4-l5 reduce	Present	Present	Normal	1	2	3	2	1	3	2	2	0	0	1	0	0	2	0
Musa Deva	40	M	7 months		vp	Reduced	mild osteo	l4-5 reduce	Absent	Present	Normal	1	2	3	3	1	3	3	3	1	1	2	1	1	2	1
Abhijeet Ja	24	M	1 yr		vp	Reduced	normal mir	maintained	Absent	Present	Normal	1	1	2	1	1	2	1	2	1	1	1	0	0	1	0
Shamrao Pa	40	M	1.5 yrs		vp	Reduced	mild osteo	l4-l5 reduce	Absent	Present	Normal	1	2	3	3	3	3	3	2	0	0	1	0	0	1	0
Ranjana Sa	37	F	6 months		pk	exaggarate	mild osteo	L5-S1 Redu	Present	Present	Normal	1	1	2	2	1	2	2	2	1	1	1	0	0	1	0
Dhanesh Pa	40	M	7 months		pk	maintained	normal mir	maintained	Absent	Present	Normal	1	3	4	3	1	4	3	2	1	1	1	0	0	1	0
Sadashiv M	50	M	6 months		vp	Reduced	osteoporos	maintained	Absent	Absent	Normal	1	2	3	2	1	3	2	2	0	0	1	0	0	1	0
Appasaheb	58	M	1 yr		vk	maintained	mild osteo	L5-S1 Redu	Absent	Present	narrow l5 l	1	2	3	2	1	2	2	2	1	1	1	0	0	2	0
Rohan Mar	34	M	6 months		vp	Reduced	normal mir	maintained	Absent	Absent	Normal	1	2	3	1	1	3	1	2	1	1	1	0	0	1	0
Vasant Mal	46	M	4 months		pk	maintained	mild osteo	maintained	Absent	Present	Normal	1	1	2	2	1	2	2	2	1	1	1	0	0	1	0
Sangram Sl	50	M	2.5 yrs		vk	Reduced	mild osteo	L5-S1 Redu	Absent	Present	Normal	1	2	3	1	1	3	1	2	0	0	1	0	0	1	0
Kalyani Kak	30	F	6 months		vp	maintained	normal mir	L5-S1 Redu	Absent	Absent	Normal	1	2	3	2	1	3	2	2	1	1	1	0	0	1	0
Sachadev K	55	M	6 months		pk	Reduced	mild osteo	L5-S1 Redu	Absent	Present	narrow l5 l	1	1	2	1	1	2	1	1	0	0	1	0	0	1	0
Seema Suta	52	f	7 months		vp	exaggarate	Decreased	L4-L5, L5-S1	Absent	Present	Normal	1	1	2	1	1	2	1	1	0	0	1	0	0	1	0
Ravindra Cl	28	M	7 months		vp	Reduced	normal mir	L5-S1 Redu	Absent	Absent	Normal	1	2	2	2	1	2	2	1	0	0	1	0	0	1	0
Vaibhav Ha	21	M	9 months		vp	maintained	normal mir	maintained	Absent	Absent	Normal	1	1	2	1	1	2	1	2	1	1	1	0	0	1	0
Vikrant Cha	28	M	6 months		pk	Reduced	normal mir	maintained	Absent	Absent	Normal	1	1	2	2	1	2	2	2	0	0	1	0	0	1	0
Sunita Kada	42	M	4 months		vp	maintained	normal mir	maintained	Absent	Absent	Normal	1	2	2	2	1	2	2	2	0	0	1	0	0	1	0
Mayur Son	28	M	6 months		vp	Reduced	normal mir	maintained	Absent	Absent	Normal	1	1	2	1	1	2	1	2	0	0	1	0	0	1	0

	Flexion			Tendemess			Pain (OLB Score)		
1	2	0	0	3	1	1	33.33	11.11	11.11
0	2	0	0	3	1	1	24.4	11.11	11.11
0	1	0	0	2	0	0	26.66	4.44	4.44
0	1	0	0	2	1	1	24.11	11.11	11.11
1	2	1	1	3	1	1	40	15.5	15.5
0	1	0	0	2	0	0	28	6	6
0	1	0	0	2	1	1	28.8	8.8	8.8
0	2	0	0	2	1	1	20	2	2
0	1	0	0	2	1	0	20	6	4
0	1	0	0	2	0	0	24	4	2
0	1	0	0	2	0	0	26	6	6
0	1	0	0	2	1	1	32	14	16
0	1	0	0	3	1	1	22.2	8.8	8.8
0	2	0	0	3	1	1	36	12	12
0	1	0	0	2	0	0	31.1	8.8	8.8
0	1	0	0	2	1	1	30	14	14
0	1	0	1	2	0	1	28	10	14
0	1	0	0	3	1	1	37.77	17.77	20
0	1	0	0	2	1	1	34	14	16
0	1	0	0	2	1	1	35.55	15.55	17.77
0	1	0	0	2	1	1	38	18	20
0	1	0	0	2	1	1	34	14	16
0	1	0	0	2	1	1	32	14	16
0	1	0	0	2	1	1	34	16	18
0	1	0	0	2	1	1	24	16	18
0	1	0	0	2	1	1	36	18	20
0	1	0	0	2	1	1	50	18	18
1	1	0	0	3	1	1	32	12	14
0	1	0	0	2	0	0	22	0	0
0	1	0	0	3	1	1	30	16	16
0	2	0	0	2	0	0	20	2	2
0	1	0	0	2	1	1	20	2	2
1	2	1	1	2	1	1	22.2	4.4	2.2
1	2	1	1	3	1	1	30	12	12
0	1	0	0	2	0	0	26.66	4.4	4.4
1	2	1	1	3	1	1	32	14	16
0	1	0	0	3	1	1	18	10	10
0	1	0	0	2	0	0	30	8	8
0	1	0	0	2	1	1	44	16	18
0	1	0	0	2	1	1	32	14	16
0	1	0	0	2	1	1	18	4	6
0	1	0	0	2	1	1	51.11	17.77	17.77
0	1	0	0	2	1	1	34	16	16
0	1	0	0	3	1	1	40	16	16
0	1	0	0	2	0	0	28	8	8
0	1	0	0	2	1	1	28	8	8
0	1	0	0	3	1	1	22.22	2.2	2.2
0	1	0	0	3	1	1	26.66	11.11	11.11
0	1	0	0	2	1	1	20	4	2
0	1	0	0	2	1	1	32	10	10
0	1	0	0	2	0	0	18	4	8
0	1	0	0	2	1	1	26.66	13.33	13.33
0	1	0	0	3	1	1	34	16	20