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AN ETIOPATHOLOGICAL STUDY OF SANDHIGATAVATA W. S. R. TO OSTEOARTHRITIS & ITS UPSHAYATMAKA PARIKSHANA WITH RASNA PANCHAKA KWATH

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ABSTRACT

According to ayurveda, *Sandhigatavata* is described under *vatavyadhi* in all samhita & sangraha grantha. The prakopa of vata may be due to two causes (a) *Avaran* (b) **Dhathu kshaya.** Avaran is one of the most important factor which is responsible for the superiorty of vata. In vriddhavastha all dhatus undergo kshaya, thus leading to vata prakopa making Sandhigatavata. According to ayurvedic literature, there are no specific etiological factors for sandhigatavata. However, the aggregative factor for vata can be adopted for it. Thus, involvement of marma, madhyamaroga marga, vata dosha & dhatukshaya make disease krachasadhya. Presenting with the classical signs and symptoms of sandhigatavata (OA), i.e. *shoola, sotha, prasaraṇeakuncana pravritti savedana and sphutan* etc., were included for the study. From the modern point of view, the disease Osteoarthritis is identical to sandhigatavata. Obesity is the most common cause of Osteoarthritis. In this study total 60 patients having the complaints of Sandhigata vata, divided in to two groups. Group A (> 25 BMI) and Group B (<25 BMI), both have given same treatment. The Rasna Panchak kwath 40 ml was given orally two times in a day in after taken meal. The follow up was recorded after every 4 weaks. The observation got are distributed & analyzed statistically. The results showed that Rasna Panchak Kwath is significant effects in group A.

KEYWORDS: Sandhigata Vata, Osteoarthritis, Rasna Panchaka Kwath.

INTRODUCTION

According to Ayurveda, simple freedom from disease is not health. For a person to be healthy he should be mentally and emotionally happy and imbalance of Doshika equilibrium is term as Roga. Among Tridosha, Vata is responsible for all Cheshta and all disease. Vata also controls the mind, sensation & perception. When this vata is disturbed, body functions also disturbed. It disturbs all events in our body and causes many types of damages and illness.

Vata is one of the three Doshas. Among tridosha vata is responsible for all cheshta and all diseases. It is a main driving force behind all physical activity and pitta dosha, kapha dosha, dhatus (tissues) and malas (excreta) are also all dependent on vata. There are many diseases which occur due to the vitiation of vata, those group of disease are considered under the heading **Vatavyadhi.**

The word Sandhigata vata is comprised of two word i.e, sandhi and vata. Sandhi is an anatomical aspect and vata is a physiological aspect of the body. There is no clear cut definition and etiology for the Sandhigata vata, but however the classical text of Ayurveda, the Charak Samhita reveals that after Nidan sevana aggrevates vata, enters into the sandhi and settles there by creating joint swelling, feeling like the air full bag, the pain mainly occurs when joints moved during flexion and extension. Sandhigatavata is most difficult problem for developing countries. It is one of the main causes of chronic disability is bad life style, diet etc. And most common cause is obesity which affecting the quality of life.

Saṅdhigatavata and osteoarthritis have common etiology and symptomatology and thus both are considered to be similar entities. Osteoarthritis is a disease of the musculoskeletal system, affecting joints mainly in the elderly population and weight bearing joints (namely, Knee joint, Cervical joint, Ankle joint etc.) and it is also known as degenerative arthritis or degenerative joint disease. This is a clinical syndrome in which low-grade inflammation leads to pain in the joints, caused by abnormal wear and tear of the cartilage that covers and acts as a cushion inside the joints and reduce of synovial

fluid that lubricates those joints. According to a survey, osteoarthritis ranks first among all the diseases in the country. The prevalence of osteoarthritis in India is higher than in postmenopausal women.

Sandhigatavata (Osteoarthritis) mainly affects the body's weight- bearing joints. Acharya Charaka was the first to describe "Sandhigata-anila" exclusively, but it is not included under in the 80 types of Nanatmaja Vatavyadhi. The provoked Vata takes shelter in the sandhi (Joint) and the affected sandhi resembles a bag filled with air. Sandhigata vata belong to madhyama roga marga and hence has participation of madhyama roga marga, vata dosha and dhatu kshaya representing illness as **kashta sadhya.**

In fact, it occurs due to both dhatukshaya and avarana types of Vatavyadhi pathogenesis. Generally, avarana of ama, kapha or meda leads to prakopa of the Vata and when it involves sandhi, it produces Sandhigatavata. It is seen in both types of patients in sthaulya (due to avarana and Nutritional deficit (due to karshya). Sandhigatavata often occurs in older adults due to Vata prakopa makes it more difficult to manage, especially when due to avarana of meda, kapha or ama or with sthaulya. Perhaps this is one of the reasons that the patients suffer from it for their whole of remaining life.

Osteoarthritis is the most common articular disorder begins asymptomatically in the 4nd and 5rd decades of life and is extremely common by age 40-60 years. Almost all persons by age 40 have some pathologic change in weight bearing joint. Osteoarthritis (O.A.) is the most common joint problem and is most common joint disease with prevalence ranging from 22% to 39% in India. It is predicted that Osteoarthritis will be biggest epidemic in India in 2013, affecting around 650 million people. The 25% females and 16% males have symptomatic Osteoarthritis.

Among medicines Rasna panchak kwath is a very unique therapeutic drug, due to its preventive, promotive, prophylactic and rejuvenating properties. Sandhigatavata (O.A) is a disorder of Vata and Vata is also controls and regulates the other two Dosha, Dhatu and Mala and also all the body activities. Therefore, once Vata is controlled by **Vata harnanam ayushadhi i.e 'Rasna Panchak kwath**'all these factors are automatically regulated and total body equilibrium is achieved.

AIMS AND OBJECTIVE OF THE STUDY

- To study the concept of aetiopathogenesis of *Sandhigatavata.*
- To study the comparative analytical description of Sandhigatavata vis-à-vis Osteoarthritis.
- To study on clinical feature, etiologies, type, sign & symptoms in relation to Osteoarthritis.
- To evaluating the therapeutic effect of *Rasnapanchaka kwath*.
- To observe the effect of *Rasnapachaka kwath* in over wt. and obese patients (BMI >25)
- To observe the effect of *Rasnapachaka kwath* in Nutritional deficit patients (BMI < 25).

STUDY DESIGN

- Conceptual study –1) Review of literature 2) Review of drug
- Clinical study
- Observation and result
- Discussion
- Summary & Conclusion

1) CONCEPTUAL STUDY

- **Review of literature**

In this part, literary review about Sandhigatavata had been collected from classical text of Ayurveda thesis of previous research work, scientific journal, periodic magazines, monographs & other available source. Similarly modern review of the disease Osteoarthritis had been collected from modern medicine books & various websites on internet and these have been properly compiled, analyzed, classified and then it had been presented on arranged manner.

- **Disease review**: In this section, detailed description about Sandhigatavata as an Ayurvedic point of view and modern point of view.
- **Drug review**: comprising brief review of drugs involved in the Rasna panchak kwath.

1) CLINICAL STUDY

Material and method

- **Material -** Source of data: In this study the patients of Roga Nidan and Kayachikitsa & Panchakarma department and other sections of Government P.G Ayurvedic Collage and Hospital chaukaghat, Varanasi. The selected cases have been done on the basis of clinical features. The diagnosis has been done on the basis of laboratory findings.
- **Method of collection of Data:** A minimum of 60 patients suffering from Sandhigatavata have been selected for the study. Those 60 patients are divided into 2 groups (30-30 patients) on the basis of BMI. Groups are as follows :

1. Group A- Patients having BMI more than 25(30 patients).
2. Group B- Patients having BMI less than 25 (30 patients).

Special proforma has been prepared with details of history taking, physical signs and symptoms as mentioned in our classics. Patients have been analyzed and selected accordingly. Patients presenting with classical signs and symptoms of Sandhigatavata (OA), viz. Shula, Shotha, Stambha, Akunchana Prasarana Vedana, Sphutana, etc. Post test of investigation had been done after 7 day of treatment and follow up 30 days. Some methods for collecting data are as follows;

a. Inclusion Criteria

- Patients suffering from classical features of Sandhigatavata and diagnosed cases of Osteoarthritis.
- Patients between age group 25 to 70 year.
- Sex- Both male and female.

b. Exclusion Criteria

- Patients age below 25 year and above 70 year.
- Patients of uncontrolled diabetes mellitus, R.A. (Rheumatiod arthritis), Gout
- Patients having any anatomical deformity (congenital deformity).
- Patient with any complication for example. chronic systemic disease, malignancy(eg Osteosarcoma, Osteoporosis, etc)
- Mentally retarded patients.
- Fibroid uterus
- Grade 4 type osteoathritis, Large osteophytes, marked narrowing of joint space, severe sclerosis and definite deformity of bone contour.

c. Assessment Criteria

These 60 patients are divided into 2 groups (30-30 patients) on the basis of BMI to assess the overall effect of Rasna Panchak Kwath on both groups of patients.

a) Subjective parameters: Patient was diagnosed on the basis of Sandhigata vata lakshanani as described in Ayurveda classics. 1. Shula 2. Shotha 3.Prasaranaaakunchanasavedana 4. Sandhisphutana.

Scoring of Assessment Criteria: Subjective parameter

Score	0	1	2	3
Shula	Absent	Mild (nagging, annoying, interfering little with ADLs	Moderate (interferes significantly with ADLs)	Severe (disabling unable to perform ADLs)
Shoth	Absent	Slight more with comparison to normal	Much elevated joint seems grossly deformed	Much elevated joint seems grossly deformed
Prasarane akunchanayo pravritti savedana	Absent	Without wincing of face	With wincing of face	Shout or prevent complete movement
Sandhisphutana	No	Slightly audible	Audible	Clearly audible

b) Objective parameters: 1. ROM- Range of Motion Goniometric Examination: The patient was first educated about the examination and was asked to lie in supine position with both the legs flat on the table exposing the legs as far as possible. The fulcrum of the Goniometer was aligned with the lateral epicondyle of the femur. The stationary arm was placed in line with the greater trochanter and midline of the femur. The moving arm was placed in line with the lateral malleolus and midline of fibula. Then the patient was asked to the joints as far as they can. The angle created was noted and recorded.

Scoring of Assessment Criteria: Objective parameter

1) ROM

a. By Goinometer

Joint Movement	Nornal Range of movement (Score 0)	(Score 1)
CERVICAL Flexion	**40°**	**< 40°**
Extension	**50°-70°**	**< 50°-70°**
Lateral flexion	**22°**	**< 22°**
Rotation	**50°**	**< 50°**
KNEE Flexion	**0°-145°**	**< 0°-145°**
Extension	**145°-0°**	**< 145°-0°**
ANKLE Planter. Flexion	**45°-55°**	**< 45°-55°**
Dorsi Flexion	**90°**	**< 90°**
LUMBER Flexion(lateral)	**0°**	**< 0°**
Extension	**15°-20°**	**< 15°-20°**
Rotation	**0°**	**< 0°**

b) By X- Ray: X –Ray of Knee/ Cervical/ Lumber/ Ankle joint in PA/ AP/ Lateral view and assessment of that in term of Kallgren & Lawrence Scale, prior to therapy for Diagnostic and screen purpose only.

S.no	X-Ray Finding	Normal (Score)	Reduce/present (Score)
1	Joint space	0	1
2	Osteophytes	0	1

2) Body mass index (Kg/m3) - Assessment of BMI

- 25-30 Kg/m3 – over weight
- > 30 Kg/m3- obese
- < 18.5 Kg/m3 – lean & thin
- 18.8 – 25 Kg/m3 – Normal weight

CRITERIA FOR ASSESSMENT OF RESULT: The efficacy of therapy will be assessed on the basis of

- Subjective parameters before & after treatment
- objective parameters before & after treatment

To assess the effect of therapy subjectively & objectively, all the sign and symptoms were given scoring depending upon their severity on the basis of subjective and objective parameters.

S. No.	IMPROVEMENT	RELIEF IN SIGN AND SYMPTOMS IN SUBJECTIVE AND OBJECTIVE PARAMETERS
1	Cured	100% Relief in sign and symptoms in subjective and objective parameters
2	Marked Improvement	>75-99% Relief in sign and symptoms in subjective and objective parameters
3	Moderate Improvement	>50 -75% Relief in sign and symptoms in subjective and objective parameters
4	Mild Improvement	>25 -50% Relief in sign and symptoms in subjective and objective parameters
5	Unchanged / No improvement	<25% Relief in sign and symptoms in subjective and objective parameters

d. Investigations

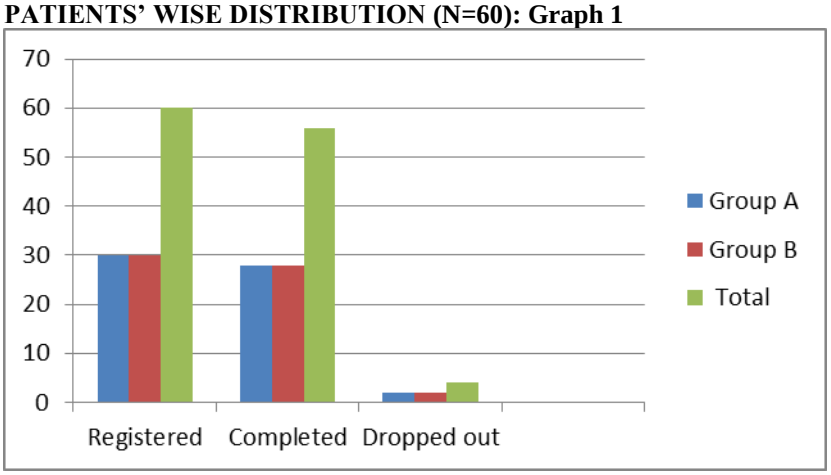
- Laboratory Investigation:

1. Hematological investigation (CBC, ESR)
2. Serum uric acid, serum urea, Serum creatinine.
3. R.A. factor.
4. CRP & ASO titer

- Radiological Investigation: X-ray.

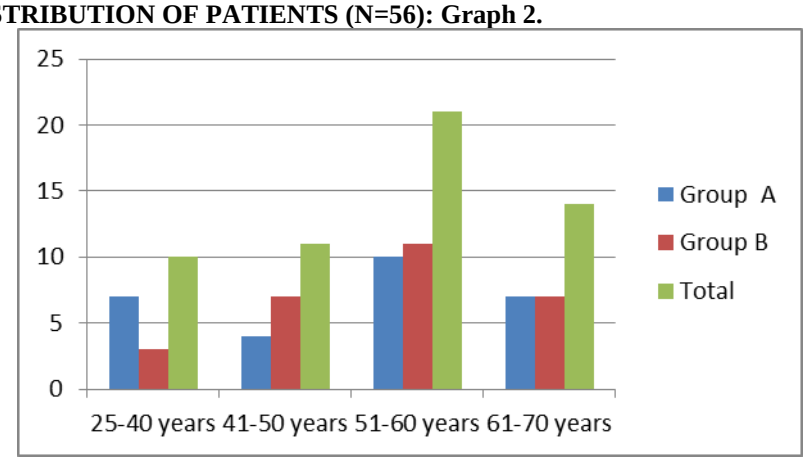
OBSERVATION AND RESULTS

- **REGISTERED PATIENTS' WISE DISTRIBUTION (N=60): Graph 1**



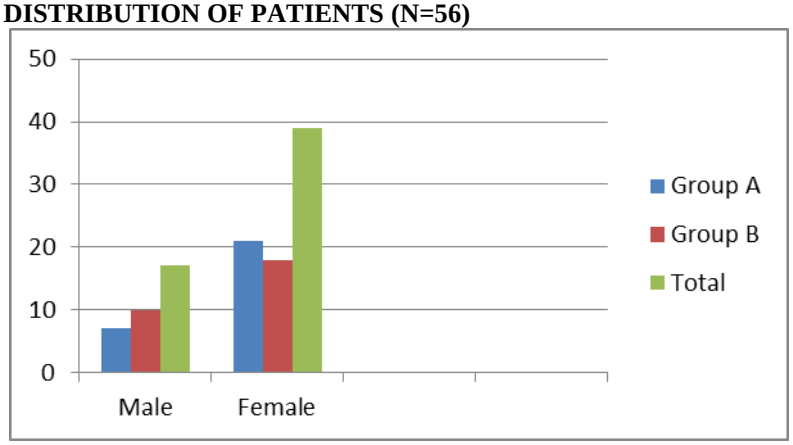
Total 30 patients were enrolled in group A (> 25 BMI) among them 28 patients completed the treatment protocol. 02 Patients left the treatment protocol in group A. One patient had left the treatment, having fibroid uterus and another patient left due to feeling of burning sensation in stomach after the drug. Total 30 patients were registered in group B among them all 28 patients had completed the treatment out of them 02 patient left treatment because of unknown cause. Hence, observations reported by 60 patients are presented here. The results of the therapy were calculated among 56 completed patients who are given in subsequent tables.

- **AGE WISE DISTRIBUTION OF PATIENTS (N=56): Graph 2.**



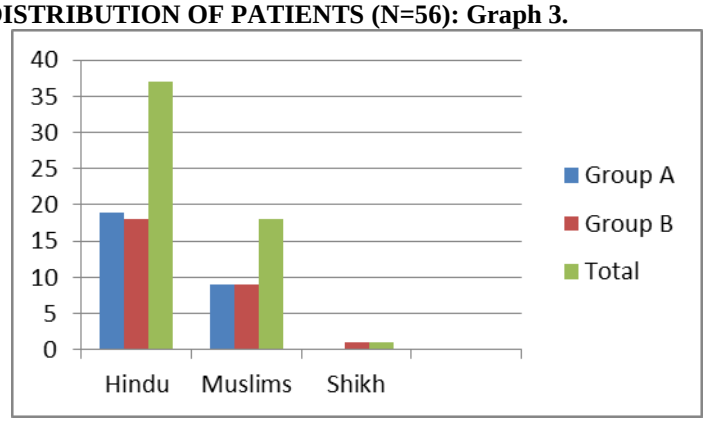
In this study maximum patients among the registered patients belongs to the age group of 51-60 years i.e., 37.5% while 25% of patients belong to age group of 61-70years, 19.64% of patients belong to age group of 41-50 years. Least patients belong to age group 25-40 years i.e., 17.85%%.

- **GENDER WISE DISTRIBUTION OF PATIENTS (N=56)**



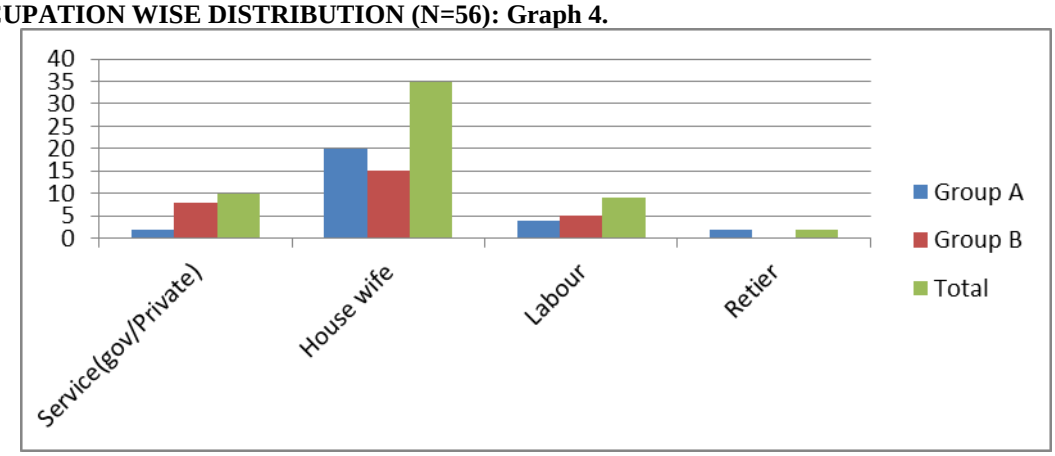
The above graph indicates that maximum registered patients were female i.e, 69.64%, while30.35% patients were male.

- **RELIGION WISE DISTRIBUTION OF PATIENTS (N=56): Graph 3.**



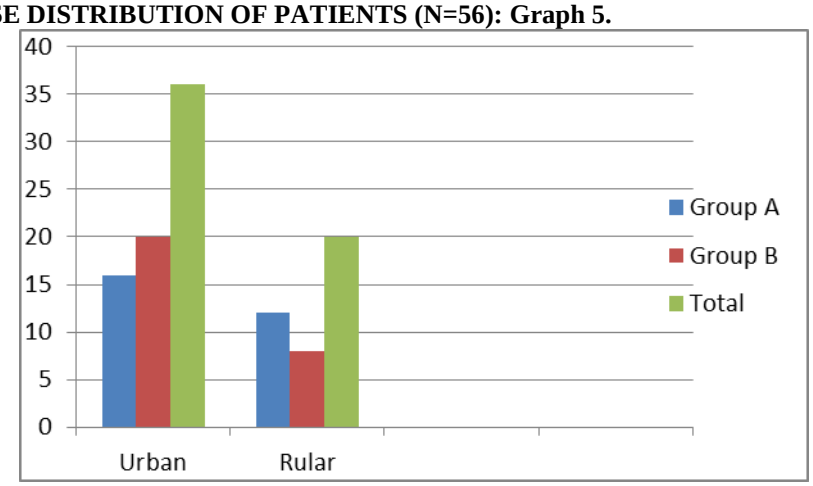
From above graph it is depicted that maximum patient belongs to Hindu religion i.e., 66.07% whereas 32.14% patients belong to Muslim religion while 1.785% were from Shikh religion.

- **OCCUPATION WISE DISTRIBUTION (N=56): Graph 4.**



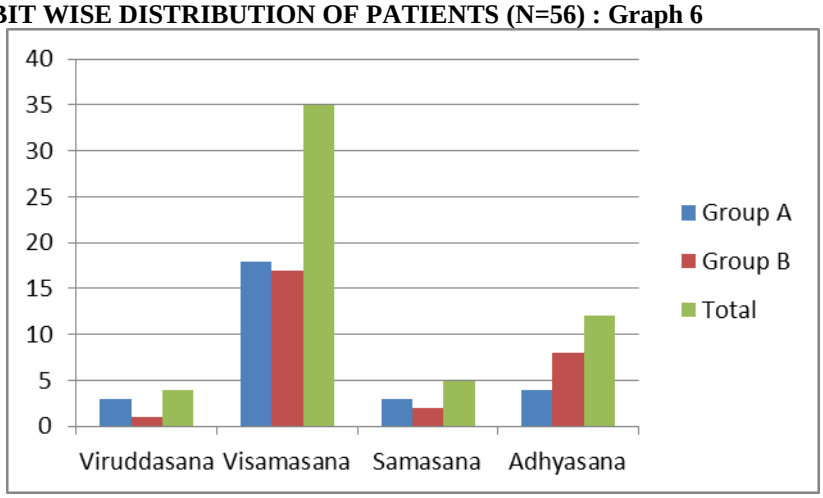
On the basis of occupation, it was observed that maximum patients were House wife i.e., 62.5%, 17.85% patients were engaged with job in Government or private sector, 16.07% are labor work and 3.5% are retier from their service.

- **HABITAT WISE DISTRIBUTION OF PATIENTS (N=56): Graph 5.**



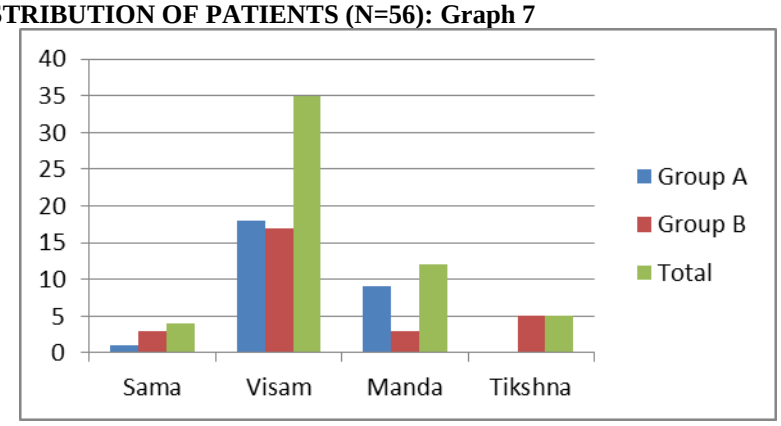
In present study maximum patients belong to urban residential area i.e., 64.28% % while that of rural residence was 35.71%.

- **DIETARY HABIT WISE DISTRIBUTION OF PATIENTS (N=56) : Graph 6**



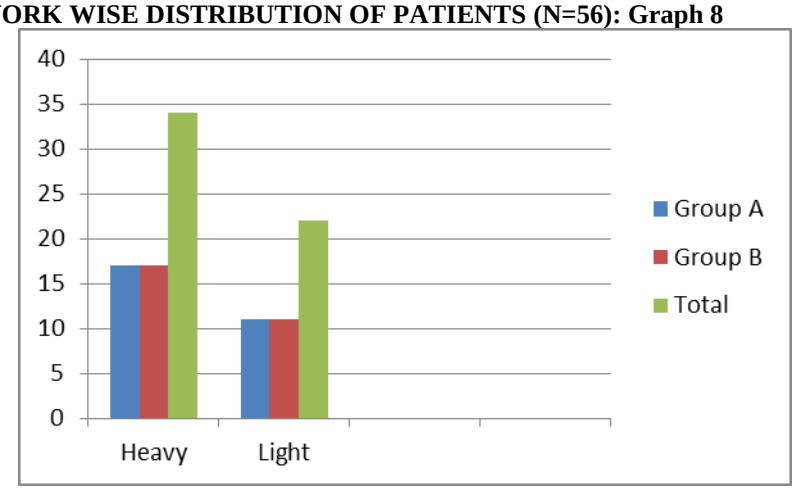
Above graph shows that maximum 62.5% patients were having *Vishamashana* type of dietaryhabit while 21.43% patients were having *Adhayasahana* type of dietary habit. 8.93% patients were reported with history of as a dietary habit, Samasana, 7.14% of patients were having *Visamasana.*

- **AGNI WISE DISTRIBUTION OF PATIENTS (N=56): Graph 7**



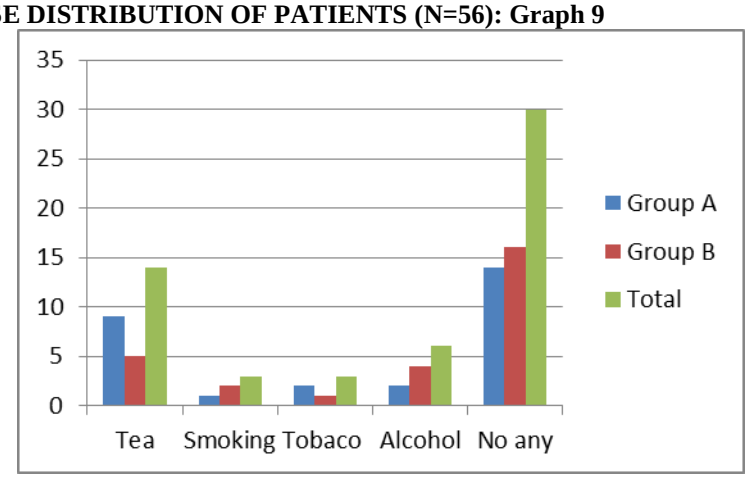
In this study, maximum patients (21.42%) had mandagni followed by 62.5% having vishamagni, and 8.92% tikshnagni and 7.14% samagni respectively.

- **NATURE OF WORK WISE DISTRIBUTION OF PATIENTS (N=56): Graph 8**



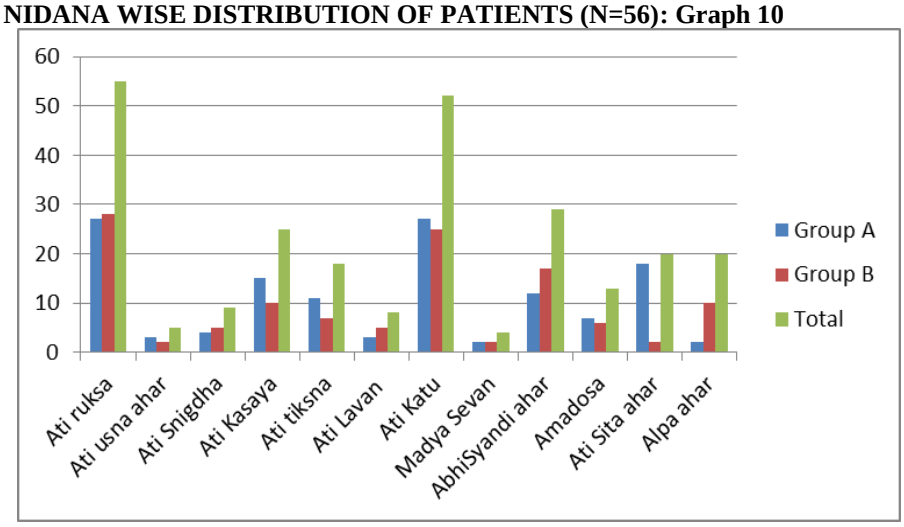
Out of 56 patients' maximum i.e., 60.71% were having history of heavy physical workwhereas 39.28% patients were doing light physical work.

- **ADDICTION WISE DISTRIBUTION OF PATIENTS (N=56): Graph 9**



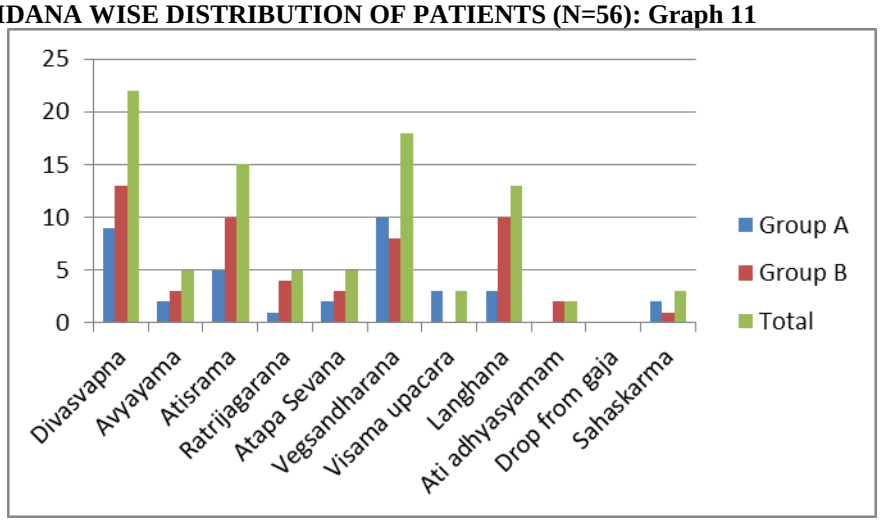
From above graph maximum i.e, 53.57% patients were no any addiction, 25% were addicted to tea while 5.35% and 5.35% patients were found to be addicted with tobacco chewing/smoking.

- **AHARAJA NIDANA WISE DISTRIBUTION OF PATIENTS (N=56): Graph 10**



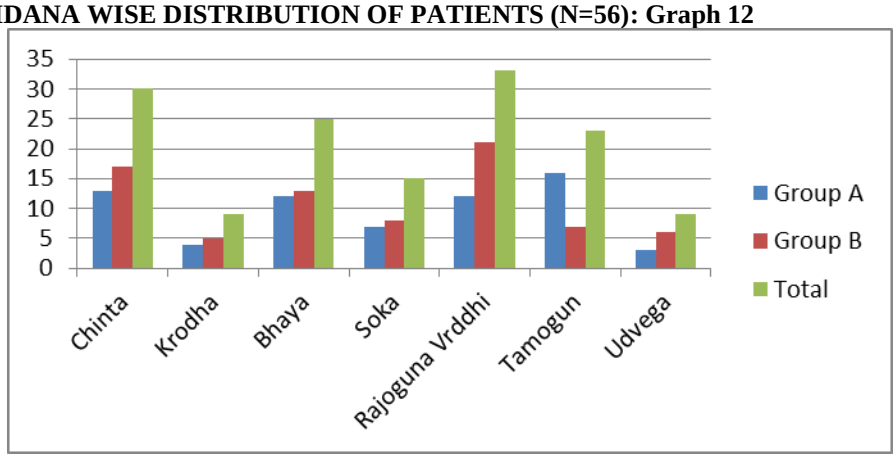
In the present study as aharaj nidana maximum patients (98.21%) had sevana of ati ruksa ahara followed by ati katu (92.85%), abhi Syandi ahar (51.78%), ati Kasaya (44.64%), ati Sita ahar (35.71%) and ati tiksna ahar(32.14%), amadosa and alpa ahara (23.21%), ati snigdha (16.07%), ati lavana(14.28%), ati usna ahar (8.92%) and madya sevan(7.14%).

- **VIARAJA NIDANA WISE DISTRIBUTION OF PATIENTS (N=56): Graph 11**



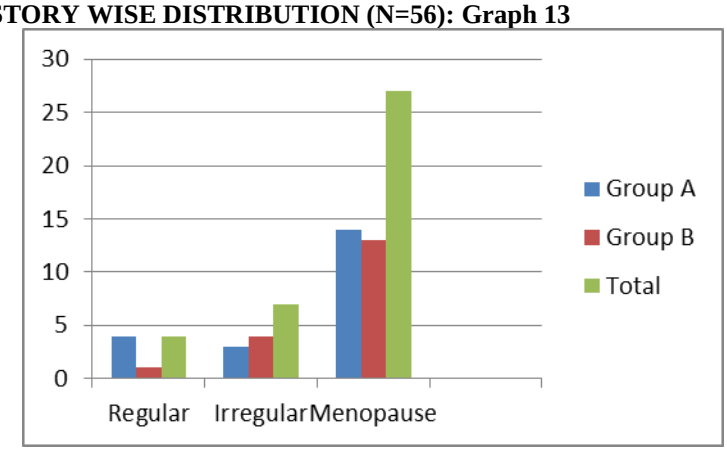
Majority of patients (39.28%) were found divasvapna followed by vegasandharaṇa (32.14%), atisrama (26.78%), langhana (23.21%), avyayama, atapa sevana and ratrijagarana (8.9%), sahaskarma, visama upachara (5.35%), ati adhyasyamam (3.57%) and drop from gaja, viman etc. (0%).

- **MASIKA NIDANA WISE DISTRIBUTION OF PATIENTS (N=56): Graph 12**



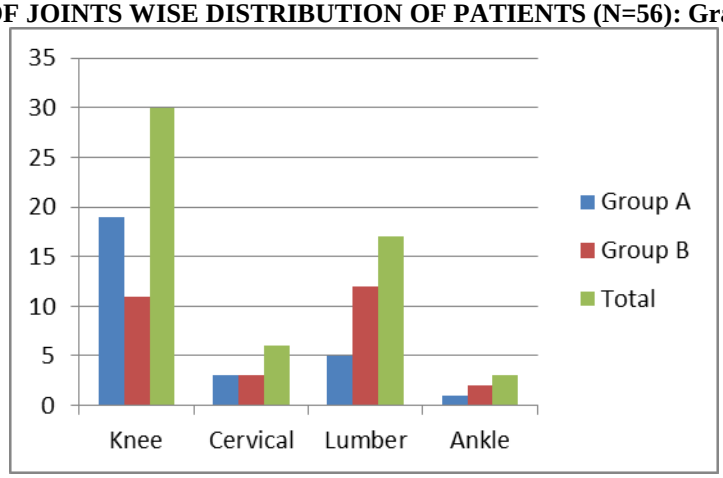
According to mansikanidana, majority of patients (58.92%) had rajoguna vrddhi, followed by had (53.57%) chinta, bhaya (44.64%), tamogun (41.07%), soka (26.78%), udvega and krodha (16.07%).

- **MENSTRUAL HISTORY WISE DISTRIBUTION (N=56): Graph 13**



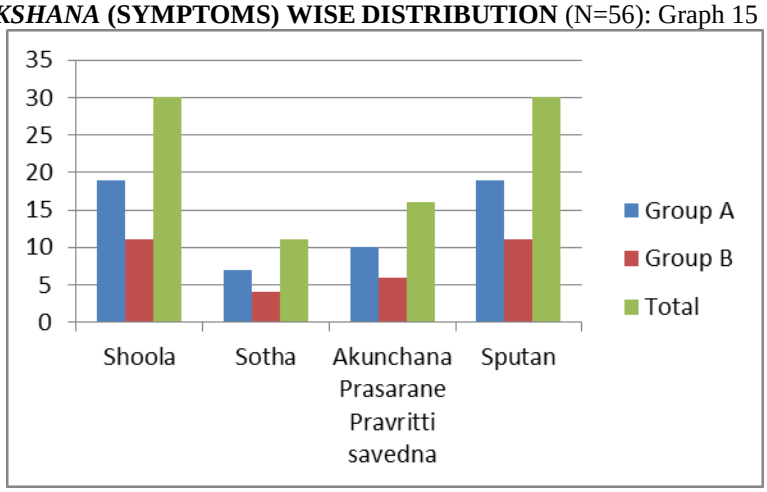
Above table maximum 48.21 patients were noted with menopause while 12.5% were irregular menstrual history, rest 7.14% patients were having normal menstrual history.

- **INVOLVEMENT OF JOINTS WISE DISTRIBUTION OF PATIENTS (N=56): Graph 14**



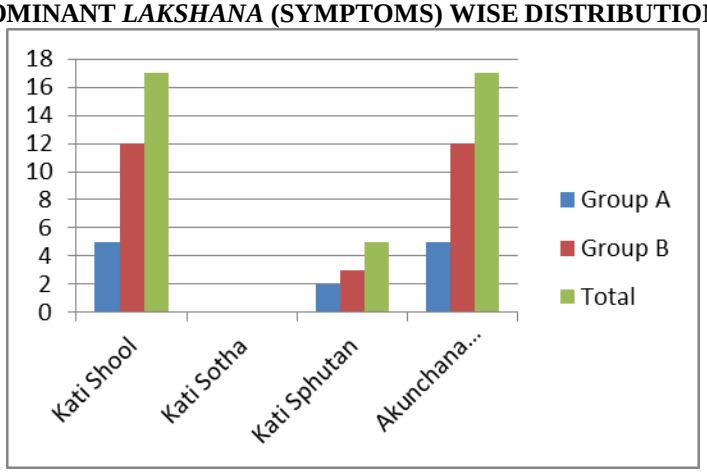
In the present study, Involvement of knee joint found in maximum number of patients (53.57%) along with that, 30.35% of Lumber joint, 10.71% were involved in Cervical joint and minimum number of patients 5.35% in ankle joint.

- **KNEE JOINT *LAKSHANA* (SYMPTOMS) WISE DISTRIBUTION** (N=56): Graph 15



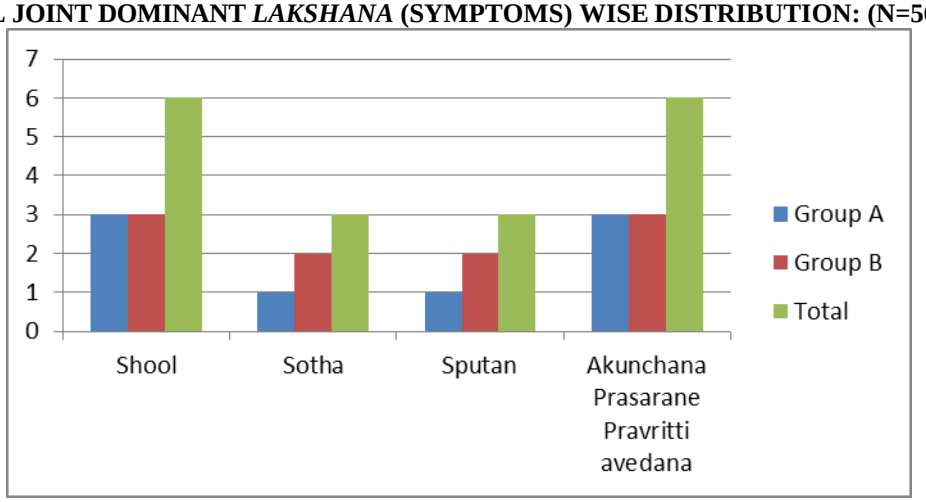
In the present study, Shoola and Akunchana Prasarane Pravritti Savedana of knee joint found in maximum number of patients (53.57%) along with that, 28.57% of Sputan, 19.64% were Sotha of patients 5.35% of Sputan and Sotha both.

- **LUMBER JOINT DOMINANT *LAKSHANA* (SYMPTOMS) WISE DISTRIBUTION(N=56): Graph 16**



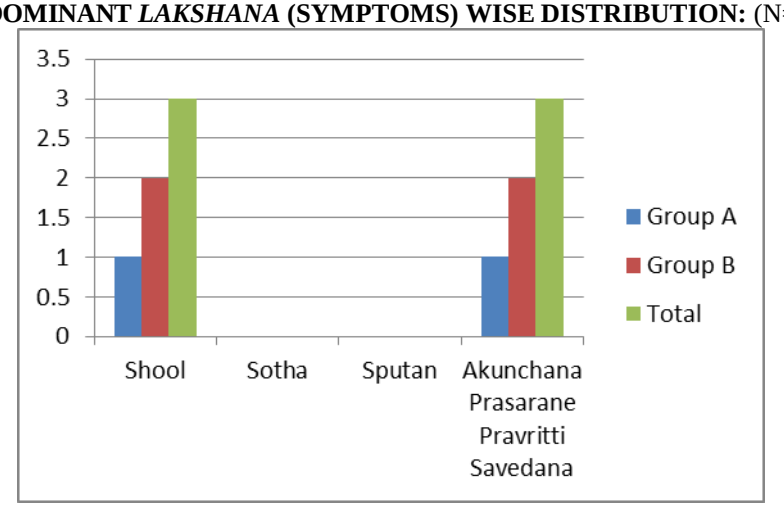
In the present study, Shoola and Akunchana Prasarane Pravritti Savedana of Lumber found in maximum number of patients (30.35%) along with that, 8.92% of Sputan**.**

- **CERVICAL JOINT DOMINANT *LAKSHANA* (SYMPTOMS) WISE DISTRIBUTION: (N=56): Graph 17**



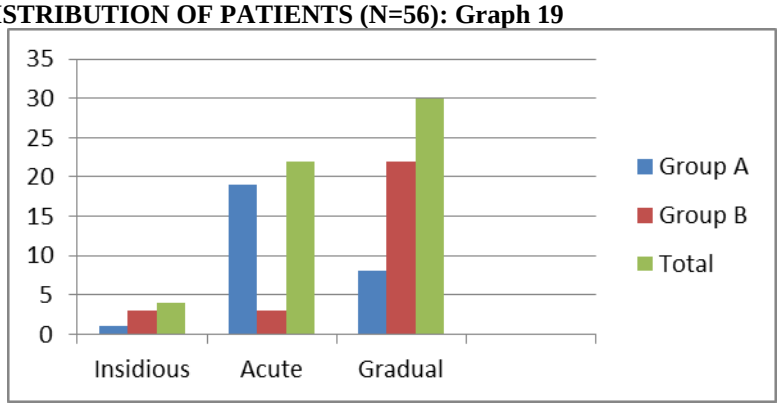
In the present study, Shoola and Akunchana Prasarane Pravritti Savedana of Cervical found in maximum number of patients (10.71%) along with that, 5.35% of Sputan and Sotha.

- **ANKLE JOINT DOMINANT *LAKSHANA* (SYMPTOMS) WISE DISTRIBUTION:** (N=56): Graph 18



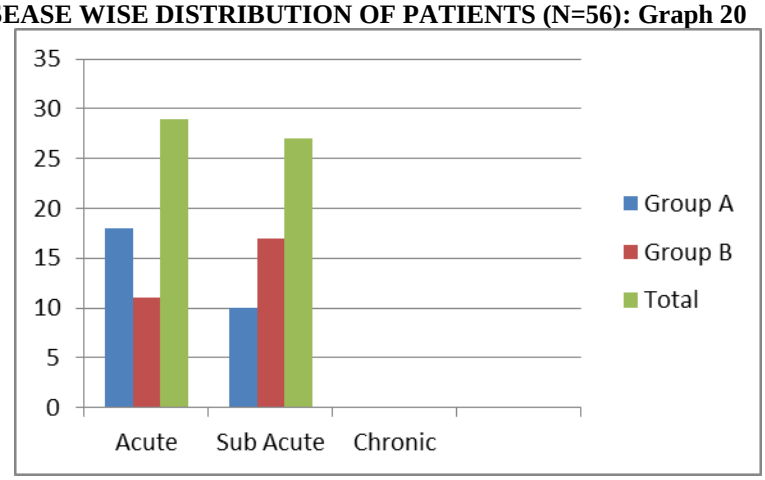
In the present study, Shoola and Akunchana Prasarane Pravritti Savedana of Ankle joints were found in maximum number of patients (5.35%).

- **ONSET WISE DISTRIBUTION OF PATIENTS (N=56): Graph 19**



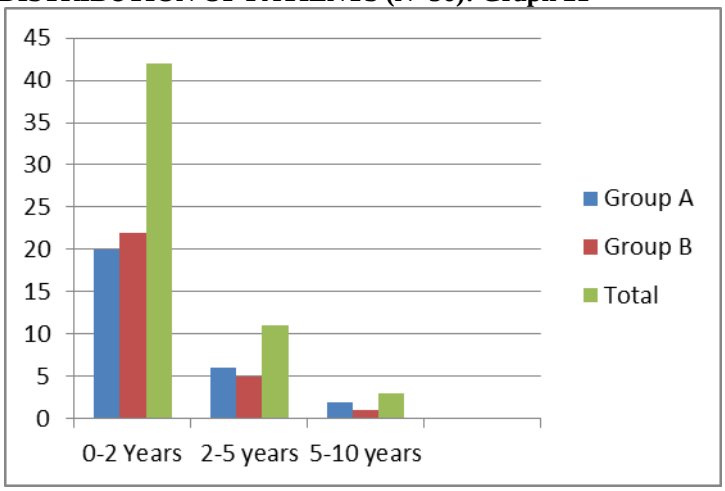
In the present study, gradual onset of the disease was found in 53.57% of patients follow by (39.28%) acute onset and insidious onset in 7.14% of patients.

- **NATURE OF DISEASE WISE DISTRIBUTION OF PATIENTS (N=56): Graph 20**



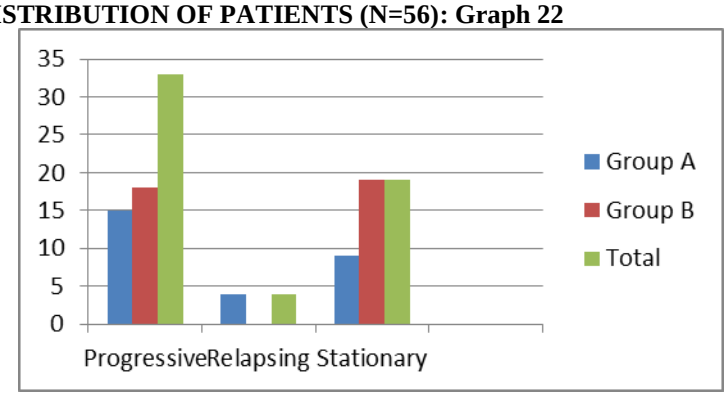
The acute nature of disease was found in 51.78%, 48.21% patients have sub-acute type of disease nature and no chronic patients.

- **DURATION WISE DISTRIBUTION OF PATIENTS (N=56): Graph 21**



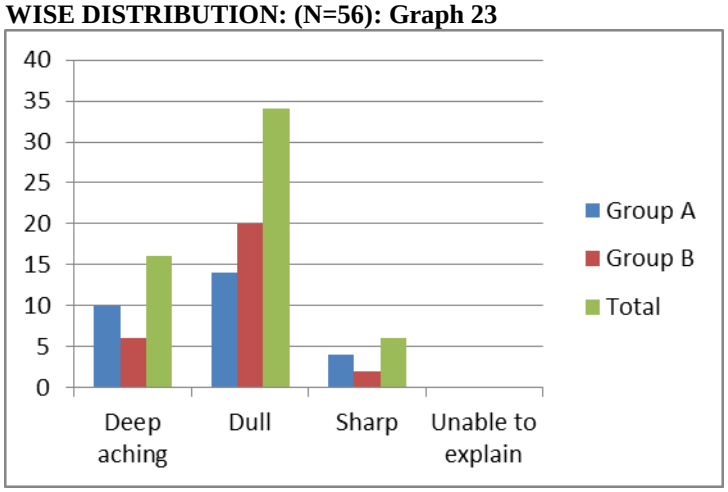
The present clinical study shows that majority of the patients (75%) were having of duration 2-5 years followed by 19.64% of 2-5 years and 5.3% of 5-10 year.

- **COURSE WISE DISTRIBUTION OF PATIENTS (N=56): Graph 22**



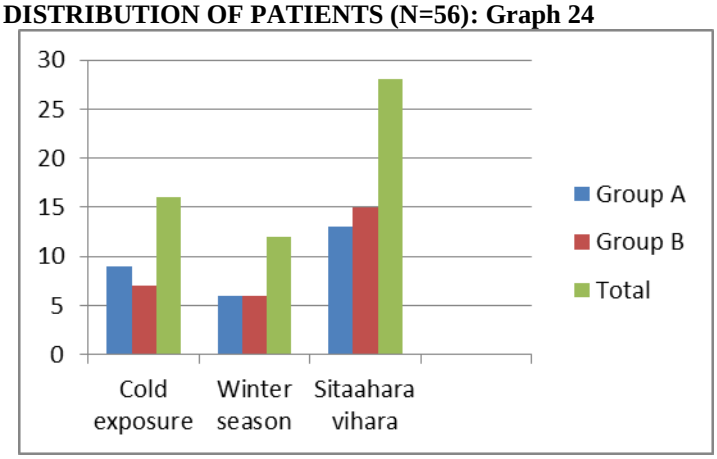
Above graph depicts that maximum i.e., 58.92% patients were having a pain, 33.92% patients were having stationary pain and 7.14% patients were having course of relapsing pain occasionally as reported in history.

- **NATURE OF PAIN WISE DISTRIBUTION: (N=56): Graph 23**



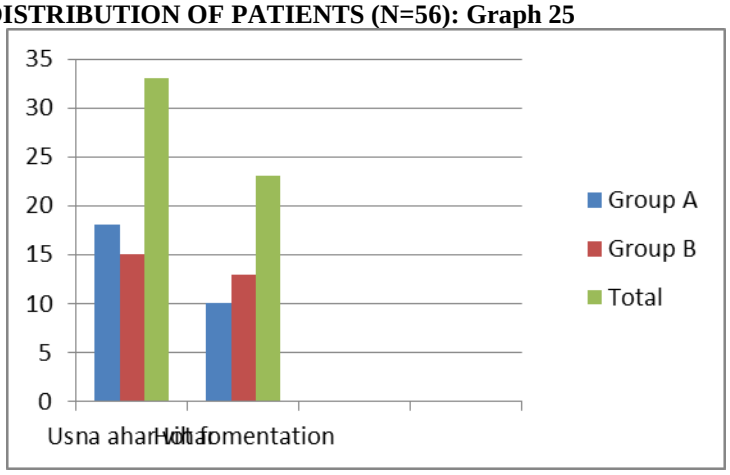
As per above graph , 60.71% patients were having pain of dull in nature, 28.57% patients were having deep aching type of pain whereas 10.71%% patients were having pain which in sharp in nature.

- **ANUPSAYA WISE DISTRIBUTION OF PATIENTS (N=56): Graph 24**



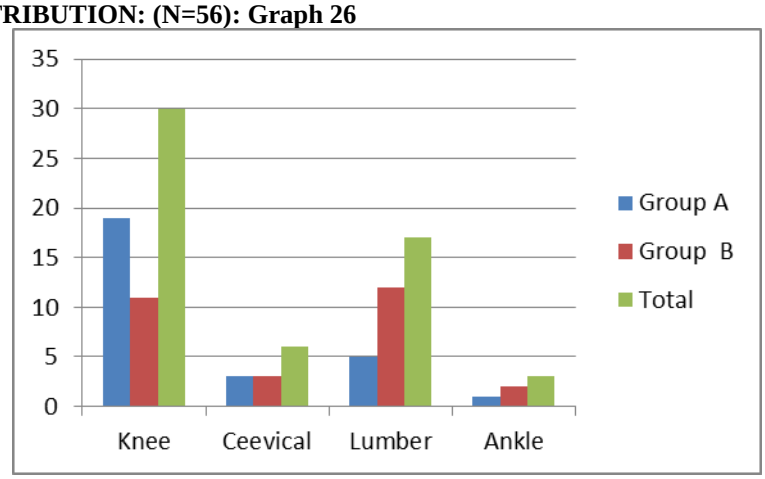
In present study it is observed that sita aharavihara was found as an exaggerated factor in the maximum 50% patients, while 28.57% patients with cold exposure and only 1.78% patients got aggravate the symptoms in winter season.

- **UPASAYA WISE DISTRIBUTION OF PATIENTS (N=56): Graph 25**



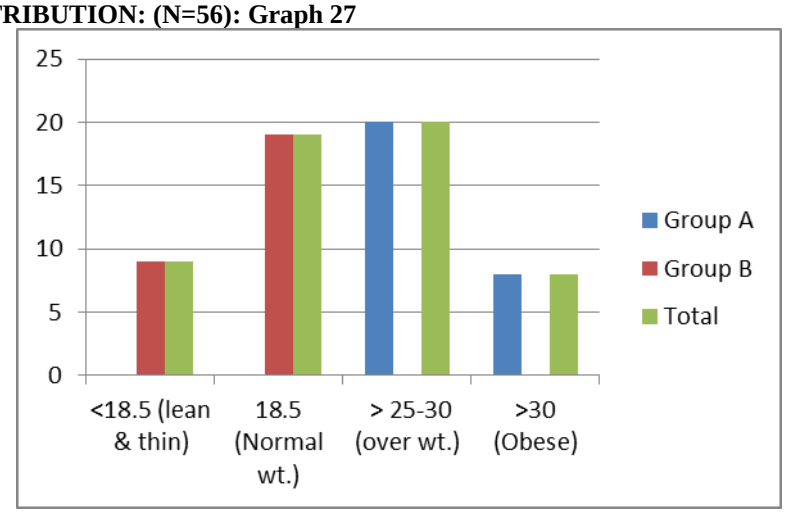
Maximum 58.92% patients got relief in the symptom with uṣṇa aharavihara followed by 41.07% with hot fomentation.

- **ROM WISE DISTRIBUTION: (N=56): Graph 26**



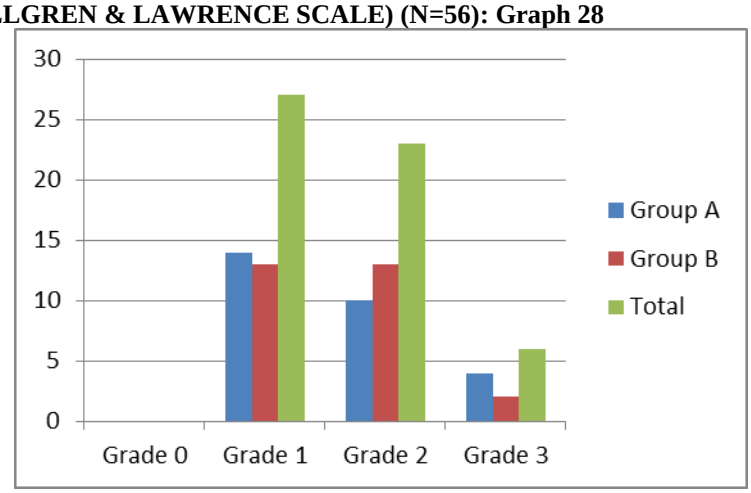
In the present study, ROM of knee joint found in maximum number of patients (53.57%) along with that, 30.35% of Lumber joint, 10.71% were involved in Cervical joint and minimum number of patients 5.35% in ankle joint.

- **BMI WISE DISTRIBUTION: (N=56): Graph 27**



In the present study, Over weight found in maximum number of patients (35.71%) along with that, 33.5% of Lumber joint, 10.71% were involved in Cervical joint and minimum number of patients 5.35% in ankle joint.

- **KL SCALE: (KELLGREN & LAWRENCE SCALE) (N=56): Graph 28**



- **EFFECT OF RASNA PANCHAKA KWATH IN SUBJECTIVE PARAMETER (IN PERCENTAGE) – Group A (>25 BMI)**

Parameter	BT	AT	%	Improvement
Shool	**1.57**	**0.36**	**77.27**	**Marked Improvement**
Shoth	**0.39**	**0.07**	**81.82**	**Marked Improvement**
Akunchanaprasarane Pravritti Savedan	**1.18**	**0.32**	**72.73**	**Moderate Improvement**
Sphutan	**0.46**	**0.39**	**15.38**	**No Improvement**

- In subjective parameter, a maximum percentage i.e., (81.82%) marked improvement was observed in shoth, (77.27%) marked improvement was observed in shool, (72.73%) moderate improvement was observed in akunchana prasarana pravritti savedana and minimum i.e., (15.38%) no improvement in sphutan.

- **EFFECT OF RASNA PANCHAKA KWATH IN OBJECTIVE PARAMETER (IN PERCENTAGE) – Group A (>25 BMI)**

Parameter	BT	AT	%	Improvement
ROM	**0.89**	**0.29**	**68.00**	**Moderate Improvement**
BMI	**29.45**	**28.75**	**2.39**	**No Improvement**

- In objective parameter, a maximum percentage i.e., (68.00%) moderate improvement was observed in ROM and (2.39%) no improvement was observed in BMI.

- **EFFECT OF RASNA PANCHAKA KWATH IN SUBJECTIVE PARAMETER (IN PERCENTAGE) – Group B (<25 BMI)**

PARAMETER	BT	AT	%	IMPROVEMENT
Shool	**1.54**	**0.43**	**72.09%**	**Moderate Improvement**
Shoth	**0.29**	**0.11**	**62.50%**	**Moderate Improvement**
Akunchanaprasarane Pravritti Savedan	**1.14**	**0.32**	**71.88%**	**Moderate Improvement**
Sphutan	**0.32**	**0.21**	**33.33%**	**Mild Improvement**

- In subjective parameter, a maximum percentage i.e., (72.09%) moderate improvement was observed in shool, (71.88%) moderate improvement was observed in akunchana prasarana pravritti savedana, (62.50%) moderate improvement was observed in shoth and minimum i.e., (33.33%) mild improvement in sphutan.

- **EFFECT OF RASNA PANCHAKA KWATH IN OBJECTIVE PARAMETER (IN PERCENTAGE) – Group B (<25 BMI)**

PARAMETER	BT	AT	%	IMPROVEMENT
ROM	0.93	0.25	73.08 %	Moderate Improvement
BMI	19.88	19.70	1 %	No improverment

- In objective parameter, a maximum percentage i.e., (73.08%) moderate improvement was observed in ROM and (1%) no improvement was observed in BMI.

RESULT

EFFECT OF RASNA PANCHAKA KWATH IN GROUP - A

In Group- A total 4 follow up of clinical trial drug were done in 28 patients of Sandhigata Vata with weekly interval. The relief in chief complaints, changes in clinical examinations and local findings were recorded in clinical research proforma. To analysis the effect of therapy statistically, Mean, Percentage, S.D., S.E., t and P values were calculated by using paired 't' test.

Table No. 1: Effect of Rasna Panchaka Kwath On Chief Complaints N=28.

Paired Samples Statistics							Paired Differences			
Group (A)		N	Mean	Std. Dev.	S.E.	% Change	t	df	p-value	Result
Shool	BT	28	1.57	0.69	0.13	77.27	11.31	27	<0.001	HS
	AT	28	0.36	0.49	0.09					
Shoth	BT	28	0.39	0.63	0.12	81.82	3.10	27	0.004	HS
	AT	28	0.07	0.26	0.05					
Akunchanaprasarane Pravritti Savedan	BT	28	1.18	0.39	0.07	72.73	12.73	27	<0.001	HS
	AT	28	0.32	0.48	0.09					
Sphutan	BT	28	0.46	0.58	0.11	15.38	1.44	27	0.161	NS
	AT	28	0.39	0.50	0.09					

*'N'= number of patients, B.T.- Before Treatment, A.T.- After Treatment, Diff- difference between the value of B.T. and A.T., S.D.- Standard Deviation, S.E.- Standard Error, 'P' value -Probability of Observations S- significance of obtained p-value and Tvalue of paired t-test.

- **Shoola (pain)** –The total effect of therapy provided statistically highly significant (p<0.001) result with 't' value 11.31.
- **Shotha (Swelling)**- The total effect of therapy provided statistically highly significant 0.004 (p<0.001) result with 't' value 3.10.
- **Akunchanaprasarane Pravritti Savedan (Restricted joint movement):** The total effect of therapy provided statistically highly significant (p<0.001) result with 't' value 12.73.
- **Sphutan (Crepitus)**- The total effect of therapy provided statistically non significant (p=0.016) result with 't' value 1.44.

Table No. 2 Effect of Rasna Panchaka Kwath On Range of Motion (N=28).

Paired Samples Statistics							Paired Differences			
Group (A)		N	Mean	Std. Dev.	S.E.	% Relief	t	df	p-value	Result
ROM	BT	28	0.89	0.31	0.06	68.00	6.46	27	<0.001	HS
	AT	28	0.29	0.46	0.09					

- **ROM**- The total effect of therapy provided statistically highly significant (p<0.001) result with 't' value 6.46.

Table No. 3 Effect of Rasna Panchaka Kwath On Bmi (N-=28).

Paired Samples Statistics							Paired Differences			
Group (A)		N	Mean	Std. Dev.	S.E.	% Relief	t	df	p-value	Result (S)
BMI	BT	28	29.45	3.90	0.74	2.39	2.33	27	0.027	S
	AT	28	28.75	3.00	0.57					

* BMI- The total effect of therapy provided statistically significant (p=0.027) result with 't' value 2.33.

Table No. 5 Effect of Rasna Panchaka Kwath On X-Ray Findind (N-=28).

Group (A)		N	Mean	Std. Dev.	S.E.	% Relief
OSTEOPHYTES	BT	28	0.57	0.50	0.10	0.00
	AT	28	0.57	0.50	0.10	
JOINT SPACE	BT	28	0.86	0.36	0.07	0.00
	AT	28	0.86	0.36	0.07	

- **OSTEOPHYTES -**The totally no effect of therapy.
- **JOINT SPACE -** The totally no effect of therapy.

EFFECT OF RASNA PANCHAKA KWATH IN GROUP – B

In Group- A total 4 follow up of clinical trial drug were done in 28 patients of Sandhigata Vata with weekly interval. The relief in chief complaints, changes in clinical examinations and local findings were recorded in clinical research proforma.

Table No. 6 Effect of Rasna Panchaka Kwath On Chief Complaints N=28.

Paired Samples Statistics							Paired Differences			
Group (B)		N	Mean	Std. Dev.	S.E.	% Relief	t	df	p-value	Result
Shool	BT	28	1.54	0.64	0.12	72.09	14.07	27	<0.001	HS
	AT	28	0.43	0.63	0.12					
Shoth	BT	28	0.29	0.53	0.10	62.50	2.42	27	0.022	S
	AT	28	0.11	0.31	0.06					
Akunchanaprasarane Pravritti Savedan	BT	28	1.14	0.36	0.07	71.88	11.14	27	<0.001	HS
	AT	28	0.32	0.55	0.10					
Sphutan	BT	28	0.32	0.48	0.09	33.33	1.80	27	0.083	NS
	AT	28	0.21	0.42	0.08					

- **Shoola (pain)** –The total effect of therapy provided statistically highly significant (p<0.001) result with‘t’ value 14.07.
- **Shotha (Swelling)** - The total effect of therapy provided statistically significant (p= 0.022) result with‘t’ value 2.42.
- **Akunchanaprasarane Pravritti Savedan (Restricted joint movement):** The total effect of therapy provided statistically highly significant (p<0.001) result with ‘t’ value 11.14.
- **Sphutan (Crepitus)**- The total effect of therapy provided statistically non significant (p=0.083) result with ‘t’ value 1.80.

Table No. 7 Effect of Rasna Panchaka Kwath On Range of Motion (N=28).

Paired Samples Statistics							Paired Differences			
Group (B)		N	Mean	Std. Dev.	S.E.	% Relief	t	df	p-value	Result
ROM	BT	28	0.93	0.26	0.05	73.08	7.55	27	<0.001	HS
	AT	28	0.25	0.44	0.08					

- **ROM-** The total effect of therapy provided statistically highly significant (p<0.001) result with‘t’ value 7.55.

Table No. 8 Effect of Rasna Panchaka Kwath On Bmi (N-=28).

Paired Samples Statistics							Paired Differences			
Group (B)		N	Mean	Std. Dev.	S.E.	% Relief	t	df	p-value	Result
BMI	BT	28	19.88	2.63	0.50	0.90	2.54	27	0.017	S
	AT	28	19.70	2.61	0.49					

* **BMI**- The total effect of therapy provided statistically significant (p=0.017) result with ‘t’ value 2.54.

Table No. 10 Effect of Rasna Panchaka Kwath On X-Ray Findind (N-=28).

Group (B)		N	Mean	Std. Dev.	S.E.	% Relief
OSTEOPHYTES	BT	28	0.61	0.50	0.09	0.00
	AT	28	0.61	0.50	0.09	
JOINT SPACE	BT	28	0.71	0.46	0.09	0.00
	AT	28	0.71	0.46	0.09	

- **OSTEOPHYTES -** The totally no effect of therapy.
- **JOINT SPACE -** The totally no effect of therapy

Table no. 11 Comparitive Effect of Rasna Panchaka Kwath On Chief Complaints of Both Group (N=56).

Independent Samples Test									
Group Compaire		N	Mean	Std. Deviation	% Change	t	df	p-value	Result
Shool	A	28	0.35	0.49	-14.29	-15.000	54.00	0.034	S
	B	28	0.40	0.63					
Shoth	A	28	0.09	0.26	-13.98	-14.10	54.00	0.037	S
	B	28	0.11	0.31					
Akunchan prasaranjanya Vedna	A	28	0.32	0.48	-15.11	-15.20	54.00	0.031	S
	B	28	0.37	0.55					
Sphutan	A	28	0.39	0.50	31.27	12.01	54.00	0.001	S
	B	28	0.27	0.42					

Table No. 13 Comparitive Effect of Rasna Panchaka Kwath On Rom of Both Group: (N-56).

Independent Samples Test									
Group Compaire		N	Mean	Std. Deviation	% Change	t	df	p-value	Result
ROM	A	28	0.29	0.46	47.50	5.60	54.00	0.024	S
	B	28	0.15	0.44					

- **ROM:** On comparing the effect of both therapy on ROM obtained p value is 0.024 i.e., significant difference statistically.

Table No. 14 Comparitive Effect of Rasna Panchaka Kwath On Bmi of Both Group: (N-56).

Independent Samples Test									
Group Compaire		N	Mean	Std. Deviation	% Change	t	df	p-value	Result
BMI	A	28	28.75	3.00	31.47	12.03	54.00	0.000	HS
	B	28	19.70	2.61					

- **BMI-):** On comparing the effect of both therapy on BMI obtained p value is 0.000 i.e., highly significant difference statistically.

RESULT

- On comparing both the groups (by Paired‘t’ test), it was found that in sandhishula(Joint pain), sandhishotha(Joint swelling) and in akunchane prasarane vedana (Pain during movements of joints), ROM & BMI in both Group, Group-A shown significant effect then Group B.

DISCUSSION

The Discussion section of the study deals with meaning, importance, relevance and analyses of the therapeutically effect on the selected problem through observations and results to focus on the research question, aim, and objectives.

- **Age**: In this study maximum 37.5%% patients were of age group 51-60 years. This period is considered as a precipitating factor for degenerative disorders of joints. Similar to the findings of modern science that, most studies conducted on osteoarthritis have concluded that ageing process is the strongest risk factor for degenerative changes occurring in weight bearing joints. Sandhigatavata is the due to dhatusaya natural consequence of old age. (Graph 2)
- **Gender**: In this study maximum patients were female i.e., 69.64% followed by male (30.35%). This observation is similar in context to previous finding by Dr Foram Joshi (2016). Due to pre-menopausal and menopausal stage in female at this

age group, early change of degenerative process is observed due to feminine hormonal status. Modern science also reflects the onset of degenerative process at 4th -5th decade of life hence current findings are suggestive of similar fact of predominance of in females.

- **Gender & Menstrual H/O**: In this study maximum patients were female i.e., 69.64% followed by male (30.35%). Due to pre-menopausal and menopausal stage in female at this age group, early change of degenerative process is observed due to feminine hormonal status.
- **Religion**: In this study maximum i.e., 66.07% patients were from Hindu religion due to majority of Hindu religion in Varanasi due to holy place.
- **Occupation:** In this study, maximum patients i.e., 62.5% were house wives. In the study patients' sample, in the region of the study the major females are house wives, habitual working for prolonged time standing & work in improper posture without rest which can be considered as provocating factor for Sandhigata Vata.
- **Habitat:** Maximum i.e., 64.28% patients were from urban are due to location of study site in urban area. Due to faulty lifestyle, negligence of body care, some patients gain weight and some patients get nutritional deficiency may consider as a trigger point in pathogenesis.
- **Dietary habit:** Majority of patients followed Visamasana (62.5%) and Adhyasana(21.43%) in their daily food habits which leads to agni vaisamya and vataprakopa resulting in dhatuksaya which coupled with old age leads to Sandhigatavata.
- **Agni:** Maximum patients had visamagni (62.5%) followed by mandagni (21.42%), suggesting impaired digestion which is due to predominance of vata kapha dosa which further result in dhatusaya due to improper nutrition..
- **Nature of work:** In present study all patients were having occupation related to physical activity among which 60.71% patients were doing heavy work for longer duration because of maximum patients were housewives. Rest all (39.28%) were having light physical work. Heavy physical work tends to cause wear and tear to joints. Repetitive stress of such work further progress to osteoarthritis in later phase.
- **Addiction:** In present study maximum 53.57% % patients were having no addiction whereas 10.71% % patients were addicted to tea. Due to Ruksha and Vyavayi Guna of nicotine, Vata Dosha would have been provoked and might have caused Sandhigatavata ultimately.
- **Hetu (Aharaja, viharaja & manshika nidan):** In aharajanidana ati ruksa in diet was present in 98.21% of patients followed by Ati katu (92.85%), which provoca vata prakopa leads to Sandhigata vata. According to viharajanidāna, majority of patients (39.28%) were found with divasvapna followed by atisrama (26.78%) and vegasandharana aggravate the kapha and produce the avaraṇa which is responsible for Avaranaja Sandhigatavata. Irregular dietary habit leads to hampering of Jatharagni function. Further suppression causes Vikruti at Dhatvagni level and cause Dhatukshaya.

Langhana (23.21%), atisrama (26.78%), avyayama, ratrijagarana and atapa sevana (8.9%) each were also found as viharajanidana. Excessive indulgence of shrama and ratrijagarana cause vata aggravation and dhatukṣaya leads to dhatuksayajanya Sandhigata vata.

According to manasika nidāna, majority of patients Rajoguna vrddhi (58%) followed by Chinta (53%), bhaya (44.64%) lead to Ksayaja Sandhigatavata and tamoguna (41.07%) and soka (26.78%) leads to Avaranajanya sandhigatavata.

- **Joint involvement:** Knee joint involvement found in maximum patients (53.57%) while Lumber joint in 30.35% of the patients. Involvement of knee joint was prominent compared to other joints, which may be due to being the main weight bearing joint and therefore more prone to wear and tear and lumber joint involvement due to heavy work done by patient because of maximum patient were labor.
- Knee joint lakshana maximum were found in Group A patients because of knee joint is weight bearing joint and group A patients were obese and over weighted.
- Lumber joint Sandhigata vata mainly in group B because of maximum patients are labor and housewife, they could not care about health and done heavy work so they are categories in nutritional deficit.
- Cervical Sandhigata Vata due to aging as a result of changes in neck joint. Disc herniation, dehydration and bone spure are all results of aging. Also due to repetitive neck motions, awakward positioning or a lot of overhead work put extra stress on your neck.
- Ankle joint Sandhigata vata in patients each due to overweight and put extra stain on your joint.
- As these joints sandhigata vata is an acute entity which progress with time, presented as continues, dull nature of pain and aggravates and relieves with the ahara and vihara, hence the study findings are same. This entity causes degenerative changes due to either reduction of space between joints or may be due to osteophyte development.
- **ROM:** According to modern degradation of cartilage and remodeling of bone due to an active response of chondrocytes in the articular cartilage and inflammatory cells in the surrounding tissues mainly in obese patients. Degenerative changes in knee joint and lumber vertebre leads to reduction of synovial fluid, reduce space between joints, formation of osteophyte in knee joint and disc desiccation and reduction of intervertibral disc, formation of osteophytes in lumber joint tends to cause restriction in lumber spine movement.

- **BMI:** overweight found in maxium patients 35.71%**.** According to Ayurveda, sthaulya (obesity) mainly occurs due to medagni-mandya which leads ama and medavriddhi. Due to vriddha meda, medasavritavata occurs, which is a cause for vata prakopa. On the other hand, due to medoagni mandya proper formation of medas dhatu does not take place. As meda is the poshya dhatu of asthi and majja, depletion of medas agni leads to asthi and majjadhatukshaya. Khavaigunya take place in asthi and majjavaha srotas where prakupita vata gets situated and the disease Sandhigata vata produces. Therefore, according to Ayurveda, correction of sthaulya or medavriddhi is essential in the treatment of Sandhigatavata.
- **KL Scale (Kellgren & Lawrence):** Grade 1 found in maximum number of patients (48.21%) along with that, (41.07%) of Grade 2 in present study. I have taken only grade 1 and grade 2 type of patient for the therapy with the help of KL. KL Scale is a common method of classifying the severity of Osteoarthritis using five grades.
- In sandhigatavata the vata is mainly vitiated by sita, rukṣa and chala guṇa. The drugs (Rasna Panchaka Kwath) have rasayana effect which improve the quality of dhatu especially mamsa, asthi and majja and Rasna vata harnanam (according to Charak).
- Overall effect of therapy suggests moderate and marked improvement in maximum subjects. Satisfactory results are obtained in patients of sandhigatavāta vis-à-vis osteoarthritis, therefore it can be concluded that the given treatment proves to be an effective remedy for sandhigatavāta. However, it is suggested that the study should be continued with larger sample and longer follow up.

CONCLUSION

The conclusions drawn from the observations and results and after keen discussion on them are presented here as under:

- Sandhigatavata can be correlated with Osteoarthritis on the basis of similarities in the symptoms, occurrence, onset and nature of the disease reviewed from ayurvedic as well as modern literature. Sandhigatavata manifests mostly in women in their fourth and fifth decades of life.
- It is concluded that non-compliance of rules related to healthy food plays a major role in causation of disease.
- Involvement of knee joint is observed maximum in comparison to the other joints.
- Among the cardinal symptoms, clinically maximum encountered symptoms were sandhisula, akunchana prasarane pravritti savedana, sandhisotha and sputana.
- Sandhigatavata is an age and work related problem. It is a very painful condition. Patient is unable to move and to do normal routine work that is the main factor which makes the disease more difficult to treat.
- Vyana vayu, asthi, sandhi, Agni and Slesaka Kapha are essential component to produce Sandhigatavata.
- Mithyaahara and Mithyavihara particularly vata and Kapha Vardhaka ahara vihara along with Avyayama, chesta alpata, obesity is found to be the causative factor of Sandhigatavata.
- Rest relieves symptoms and physical exertion exacerbates symptoms.
- Chronicity, severity, obesity and multiple joint involvements does not yield good improvement in symptoms.
- From the present study it may be concluded in general that Sandhigatavata is gradual in onset, more in menopausal women, in patients possessing madhyama kostha and mandagni indicating role of Vata-kapha dosha and marga avarana.
- Patients' mobility was improved significantly in both groups which indicates efficacy of Rasna Panchak kwath in improving the chief complaints.
- Evaluation within the group shows, improvement in cardinal symptoms in Group A then Group B which is statistically highly significant.
- The improvement of the patients in both the groups in regard to chesta (movements) of affected joint was significant that indicates formulation's effectiveness on cardinal symptoms.
- On comparing the effect, it was found that as Group A shows improvement in assessment parameters but statistically there is differential change between both the groups in sandhishula, akunchan prasarane vedna, and sandhishotha and it is statistically significant.
- Complete relief was not found in any patients of either group.
- Overall effect of therapy suggests moderate and marked improvement in maximum subjects. Satisfactory results are obtained in patients of sandhigatavāta vis-à-vis osteoarthritis, therefore it can be concluded that the given treatment proves to be an effective remedy for sandhigatavāta.

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