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'AN ETIOPATHOLOGICAL STUDY OF VATARAKTA W.S.R TO SERUM URIC ACID AND ITS UPSHAYATMAKA PARIKSHANA WITH VASADI KWATHA'

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ABSTRACT

The prevalence of lifestyle disorders is currently rising quickly in our culture. Over consumption of unhealthy foods, alcohol and fructose sweetened soft drinks in combination with a sedentary lifestyle has resulted in increased prevalence of visceral obesity, metabolic syndrome and gout in all socioeconomic groups of society including the upper and middle socioeconomic status. One of the most common lifestyle ailments is gout. The clinical manifestation and textual references of gout may be attributed with Vatarakta, also known as Vatashonita. The primary Dosha and Dushya involved in the pathology of Vatarakta are Vata and Rakta, respectively. Vata dosha and Rakta dhatu gets aggravated by Virudha Ahar and Vihara. Provocated Vata gets Aavrut with vitiated Rakta dhatu, which starts the pathophysiological cascade of Vatarakta. The patients for this study were diagnosed based on Ayurvedic and modern parameters. Serum uric acid was regarded as an investigation-based diagnostic tool, whereas clinical signs and symptoms mentioned in classical texts were taken into consideration as diagnostic tool. Total 60 patients were registered for the trial. Total 60 patients were registered in trial. The selected patients were given the trial drug i.e, Vasadi kwatha, 50ml twice a day with plain water after food. Out of 60 registered patients, 5 dropout from the trial, 38.2% patients showed Marked improvement while 43.6% patients showed Moderate improvement, 18.2% patients showed poor improvement. None of patients remained unimproved or deteriorated during the clinical trials. In the present study, none of the patient reported any adverse effect to the trial drug during study and follow up period.

KEYWORDS: Vatarakta, obesity, gout, lifestyle, vasadi kwatha.

INTRODUCTION

The health of an individual depends solely on his diet and lifestyle. Nowadays, Human beings are more vulnerable to metabolic disorders due to their indulgence in unwholesome dietary habits. These disorders may be causing functional impairment or crippling disorders like vatarakta. The clinical features of Vatarakta resembles with Gout described in Modern medical sciences.

The rich those who have plenty of resources and are delicate, are mostly affected with the disease so it is also named as Aadhyavata. Khudda means small joint, because the disease affects mostly the smaller joints of the body so, it is called as khuddavata.

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The prime causative factors of Vatarakta are Vata dosha and Rakta dhatu which vitiate by their own different nidana, involved in the samprapti of the disease. When a person does not opt for purification processes like vamana and virechana or due to trauma and other causes, Rakta dhatu gets vitiated then the same individual with vitiated Rakta dhatu when starts taking Vata prakopaka ahara and vihara, becomes prone to Vata vriddhi.

Already vitiated Rakta dhatu obstructs the path of vridhha Vata, in which the Vata has to flow, this vitiated Vata becomes aavrit with vitiated Rakta dhatu, vridha and obstructed Vata inturn vitiates the whole Rakta and manifests as Vatarakta.

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The doshas get lodged in sandhies. The main and first site of manifestation is padamula

(1st metatarsophallangeal joint) and then hasta and pada and from there onwards spread upwards. It has two stages i.e, Uthana and Gambhira. Gambhira Vatarakta mainly affects Asthi dhatu and causes ruja, the process of spreading of manifestations can be understood by the similar nature to that of Akhorvisha (Rat poison).

In modern era, the global burden of gout is substantial and seems to be increasing in parts of World. Several studies suggest that incidence of gout has risen in recent decades.

Gout mostly affects middle aged to elderly men and postmenopausal women. It is more common in men than women with estimated ratio of 10:1. The most common type of inflammatory arthropathy is gout. There are many known risk factors for the development of gout, including genetics, food, alcohol use, metabolic syndrome, hypertension, obesity, use of diuretics, and chronic renal disease. The development of gout must occur in the presence of hyperuricaemia, or elevated serum uric acid levels. One tenth of hyperuricemic patients experience the illness.

Gout has recently been linked to a higher risk of metabolic syndrome, NIDDM, and adverse cardiovascular outcomes. This raises severe concerns in light of the widespread prevalence of CAD and NIDDM. Men with gout have been shown an increase in mortality from CAD across the board. Women with gout have a much higher risk i.e 39% to have a heart attack than women without gout.[5] This risk is comparatively less in males suffering from gout i.e., 11% than others.

A treatment option available for acute gout includes NSAIDs, colchicine, corticosteroids, anti- hyperuricemic drugs and uricosuric agents. These pharmacological agents are associated with significant adverse effects and thus have certain limitations. Surgery is occasionally required to deal with large or ulcerating tophus. So, modern medicines are neither promising nor fulfilling the expectation of patients. Hence there is need of safe and cheap drug that possess significant potency and efficacy with least side effects. Therefore, the present research work 'An Etiopathological Study of Vatarakta w.s.r To Serum Uric Acid And Its Upshayatmaka Parikshana With Vasadi Kwatha'was conceived.

AIM AND OBJECTIVES

1. To evaluate the concept of Etiopathogenesis of Vatarakta.
2. To evaluate the role of Vasadi kwatha in managing S.Uric Acid levels in Vatarakta.
3. To evaluate the comparative description of Vatarakta w.s.r to Gout.

PLAN OF STUDY

- Conceptual study
  - Review of literature
  - Review of drugs
- Clinical study
  - Material and Methods
- Observation and Result
- Discussion
- Summary and conclusion

CONCEPTUAL STUDY

- In this part of study "literary review" about the disease vatarakta will be collected from the classical text of Ayurveda thesis of previous research, scientific journals, periodicals magazines, monographs and other available sources.
- Similarly Modern review of the disease Vatarakta has been collected by referring several text books of pathology, medicine, scientific journals, periodical magazines, monographs and other available sources and these have been properly compiled, analysed, classified, and then presented in arranged manner.
- **Disease review**: This section includes the detailed description about Vasadi kwatha from both the Ayurvedic point as well as Modern point of view.
- **Drug review**: Includes the brief description of the drugs involved in the formation of Vasadi kwatha.

CLINICAL STUDY
MATERIALS AND METHODS

In the present study, with the above mentioned aims and objective, the clinical study progressed utilizing the clinical material as under,

- Selection of patients: 60 patients fulfilling the criteria for the diagnosis of the disease were registered for the present study from the OPD of govt. P.G. Ayurvedic college and hospital, Varanasi.
- Sampling technique: The patient were selected irrespective of their age, sex, religion, etc, and simple random sampling technique was followed for the Patients in a single group.

Research Design: Single Arm Trial
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 Vatarakta, viz. Shula, Shotha, Raga, Toda, Akunchana Prasarana Vedana, sandhigraha etc.

Registered patients were completely assessed after every 15 days for any improvement in the subjective parameters, till the completion of trial period of 30 days. Serum uric acid was considered as main objective criteria of assessment. Various signs and symptoms were accorded grades according to the severity for the purpose of assessment. Hematological, biochemical were done both before and after the therapy.

All the patients were advised to take low protein diet. Patients were advised to avoid alcohol, meat, egg, fish, cheese, *Ruksa* (dry), irritant, astringent, salty, sour foods

and pulses with intact outer coat. Patients were also advised not to practice *Visma-asana*, *Nidra vipryaya* (sleeping at day time and remain awake at night). Overweight study subjects were encouraged to lose weight. Light exercise was advised to all registered patients. Patients were advised not to adopt stressful life style and advised to avoid long journeys and carry heavy weights.

INCLUSION CRITERIA

- Patient between age group 16 to 70 years of either sex.
- Patients presenting with the classical sign and symptoms, Purva rupa (early symptoms) and Rupa (Symptoms) of Vatarakta.
- Newly diagnosed cases of Vatarakta.
- Patients of Hyperuricemia with gouty arthritis.

EXCLUSION CRITERIA

- Patients below 16 and above 70years of Age.
- Long standing chronic cases of Vatarakta with upadrava of Vatarakta.
- Patients associated with metabolic disorder and systemic diseases.
- Patients of autoimmune joint disorder except RA.
- Patients suffering from carcinoma.
- Patients having HIV and other immuno-compromised disease.
- Pregnant and lactating mother.

Assessment Criteria

Score and grading parameters on the basis of signs and symptoms.

Subjective parameters

SANDHISULA (Pain)

Grading Criteria	Symptoms
0	No Pain
1	Mild Pain
2	Moderate Pain
3	Severe Pain

DAHA (Burning sensation)

Grading Criteria	Symptoms
0	Absent
1	Mild
2	Moderate
3	Severe

SANDHI SHOTHA (Swelling)

Grading Criteria	Symptoms
0	No Swelling
1	Slight Swelling
2	Moderate Swelling
3	Severe swelling

SPARSHASAHATWA (Tenderness)

Grading Criteria	Symptoms
0	Absent
1	Mild
2	Moderate
3	Severe

JOINT DEFORMITY

Grading Criteria	Symptoms
0	Absent
1	I In one part
2	More than one
3	Many parts

TYPHUS FORMATION

Grading Criteria	Symptoms
0	NO
1	YES

S.N.	Symptoms
7	Kandu
8	Raga
9	Toda
10	Prasarana-Aakunchana Janya vedan
11	Shyawata
12	Sandhigraha
13	paka

Score and grading parameters on the basis of signs and symptoms

Objective Criteria

- Serum uric acid values before and after the upashayatmaka parikshan will be assessed.
- The statistical analysis of these values will be done before the start and finally after the completion of upashayatmaka parikshana.

Serum Uric Acid (mg/dl)

Normal range of serum uric acid – **upto 6.8 mg/dl**

0	**INITIAL READING** **Decrease in serum uric acid (mg/dl)**	**GRADING**
1	Decrease upto < 0.5 mg/dl	Poor improvement
2	Decrease between 0.5 to 1 mg/dl	Mild improvement
3	Decrease between 1 to 2 mg/dl	Moderate improvement
4	Decrease between 2 to 3 or > 3mg/dl	Marked improvement

Laboratory investigations

Following laboratory investigations were carried out in the registered patients to confirm the diagnosis and to rule out other concomitant disease both before and after the therapy.

1. Routine haematological investigations (Hb gm%, TLC, DLC, ESR).
2. Biochemical investigations (S. Uric acid, R.A factor, ASO Titre).
3. Radiological examination of the joints if required.

- For clinical trial.

S. No		Normal Range
1.	Complete blood count (CBC)	
	Total Leucocyte count (TLC)	4000-11000cells (10^3/□L)
	Differential Leucocyte Count	
	*Neutrophils *Lymphocytes *Monocytes *Eosinophils *Basophils	40-75% 20-42% 1-7% 2-6% 0-1%
3.	ESR in mm/hr.	
4.	Hemoglobin in gm/dl	

For differential diagnosis

RA, ASO TITRE

Study design

Total 60 patients were registered for the clinical study. Out of which 5 patients were dropped out. Hence the trial was performed on 55 patients, as follows.

- Number of patients registered: 60
- Dropped out: 5
- Patients completed course: 55
- Trial drug: Vasadi Kwath
- Dose: 50 ml BD after food.

ASSESSMENT OF OVERALL EFFECT

The treatment effect will be assessed on the basis of the relief of sign and symptoms of the disease on scoring pattern.

Detail clinical observation were done 1 month of treatment for the assessment of result and the final data has been divided into 4 groups.

OBSERVATION AND RESULT

1	Marked improvement	>75% Relief in sign and symptoms and S.Uric Acid within the normal range.
2	Moderate improvement	50%-75% Relief in sign and symptoms
3	Mild improvement	25-49% Relief in sign and symptoms
4	No improvement	<25% relief in sign and symptoms.

OBSERVATION AND RESULT

DEMOGRAPHIC DISTRIBUTION

Table No. 1: Distribution According to Age.

Variable		No.	%
Age	20 - 29 yr	8	14.5%
	30 - 39 yr	20	36.4%
	40 - 49 yr	12	21.8%
	50 - 59 yr	9	16.4%
	60 - 70 yr	6	10.9%

Among the participants, 8 individuals (14.5%) fell within the age group of 20 to 29 years. The next age group, comprising participants aged 30 to 39 years, consisted of 20 individuals, accounting for 36.4% of the total participants. The 40 to 49 years age group had 12 participants, making up 21.8% of the study population.

9 individuals (16.4%), were in the age range of 50 to 59 years. Lastly, the age group of 60 to 70 years consisted of 6 participants, representing 10.9% of the total participants.

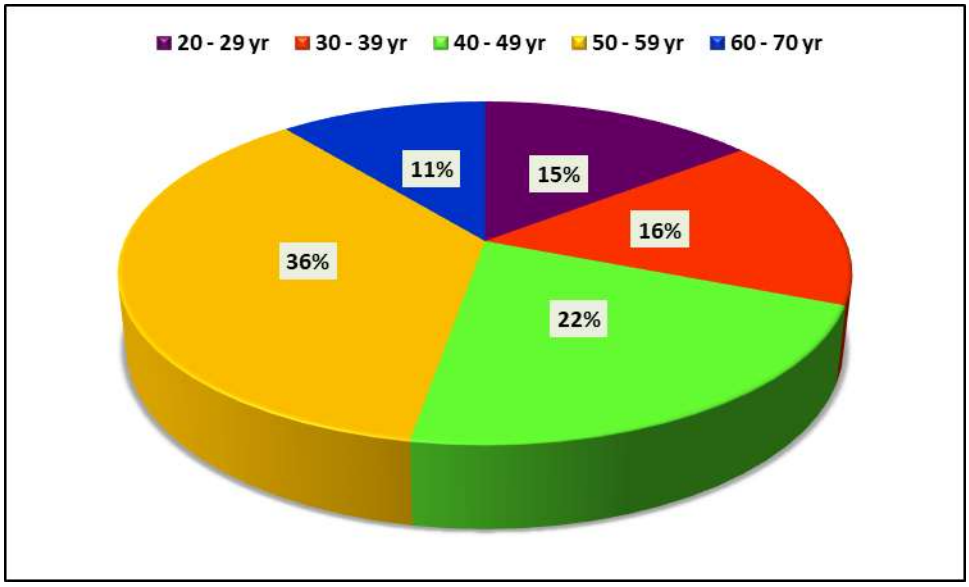


Table No. 2: Distribution According to Sex.

Variable		No.	%
Sex	Female	24	43.6%
	Male	31	56.4%

In the present study, out of 55 patients, 56.4% were Male and 43.6% were Female.

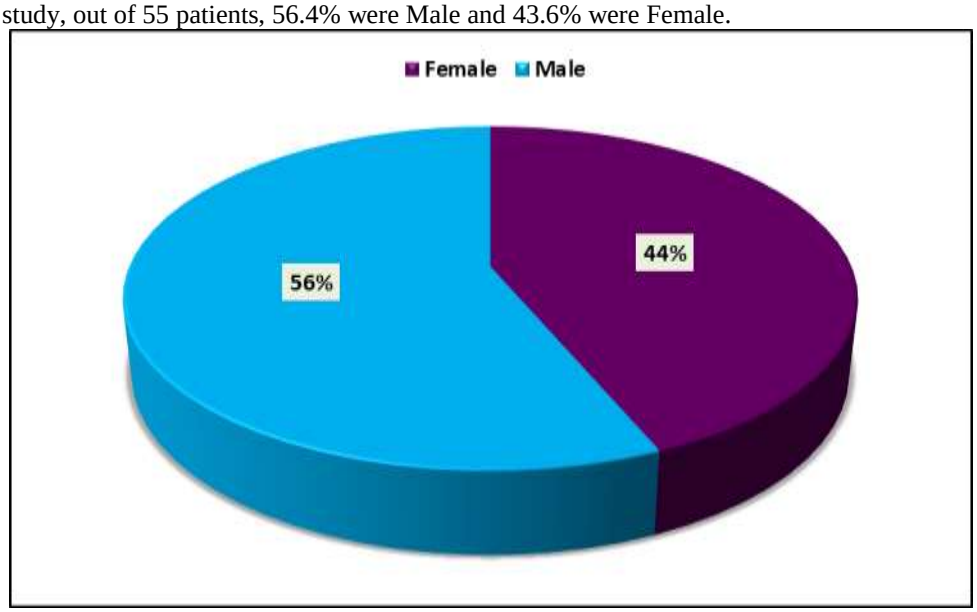


Table No. 3: Distribution According to Religion.

Variable		**No.**	**%**
Religion	Hindu	42	76.4%
	Muslim	13	23.6%

In the present study, out of 55 patients, 76.4% belongs to Hindu religion and 23.6% belongs to muslim region.

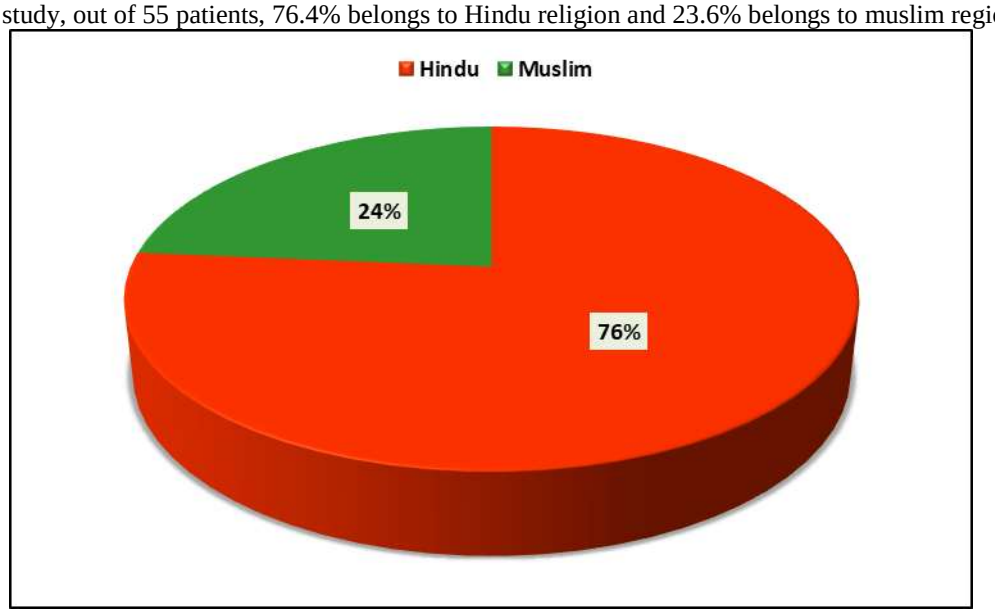


Table No. 4: Distribution According to Occupation.

Variable		No.	%
Occupation	Agriculture	9	16.4%
	Businessmen	6	10.9%
	Housewife	17	30.9%
	Labour	3	5.5%
	Service	14	25.5%
	Student	6	10.9%

In present study maximum no. of patients i.e 30.9% were Housewife, 25.5% Patients were Serviceman, 10.9% patients are Student, 16.4% patients related to Agriculture, 10.9% patients are Businessman and 5.5% patients are Labour.

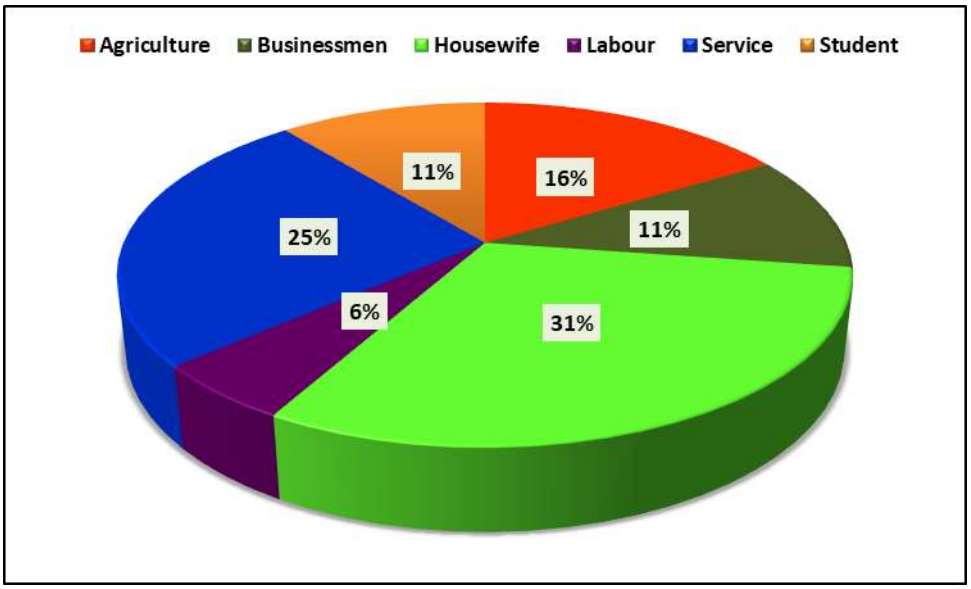


Table No. 5: Distribution According to Marital Status.

Variable		No.	%
Marital status	Married	49	89.1%
	Unmarried	6	10.9%

In the present study, out of 55 patients, 89.1 % were married and 10.9% were unmarried.

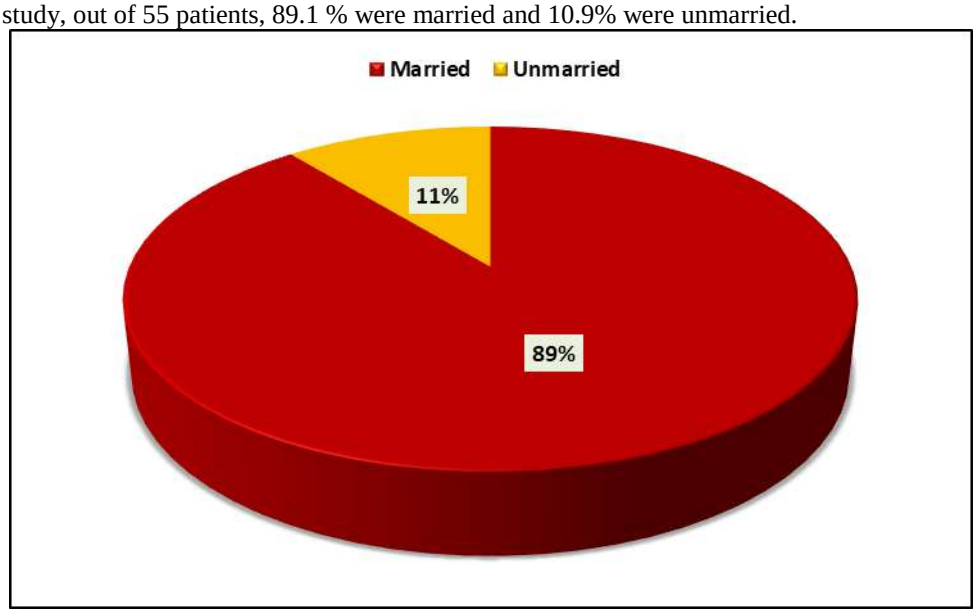


Table No. 6: Distribution According to Habitat.

Variable		No.	%
Habitat	Rural	25	45.5%
	Urban	30	54.5%

In the present study, out of 55 patients, 45.5% belongs to rural area and 54.5% belongs to urban areas.

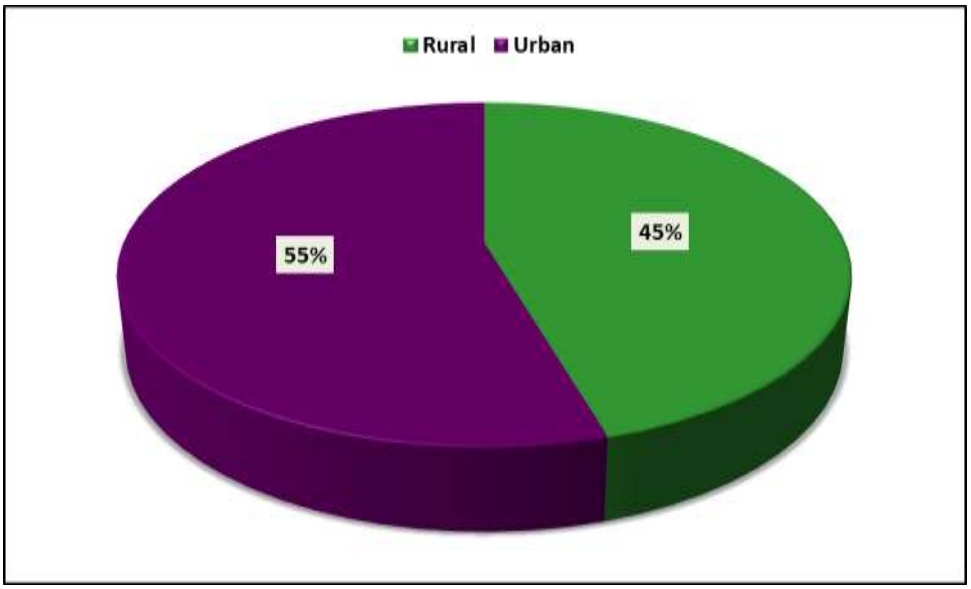


Table No. 7: Distribution According to Socio-economic status.

Variable		No.	%
Socio-economic status	Lower Class	12	21.8%
	Middle Class	28	50.9%
	Upper Class	15	27.3%

In the present study, out total 55 participants, 21.8% fall under the lower class category, while 50.9% belongs to the middle class and 27.3% belongs to upper class.

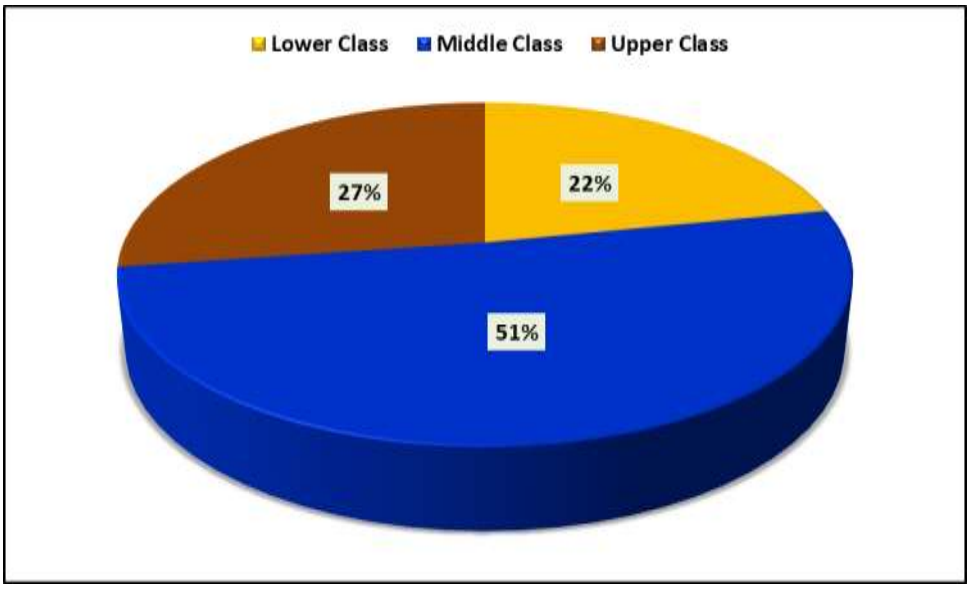


Table No. 8: Distribution According to Educational status.

Variable		No.	%
Educational status	Educated	40	72.7%
	Uneducated	15	27.3%

In the present study, out of 55 patients, 72.7% were educated and 27.3% were uneducated.

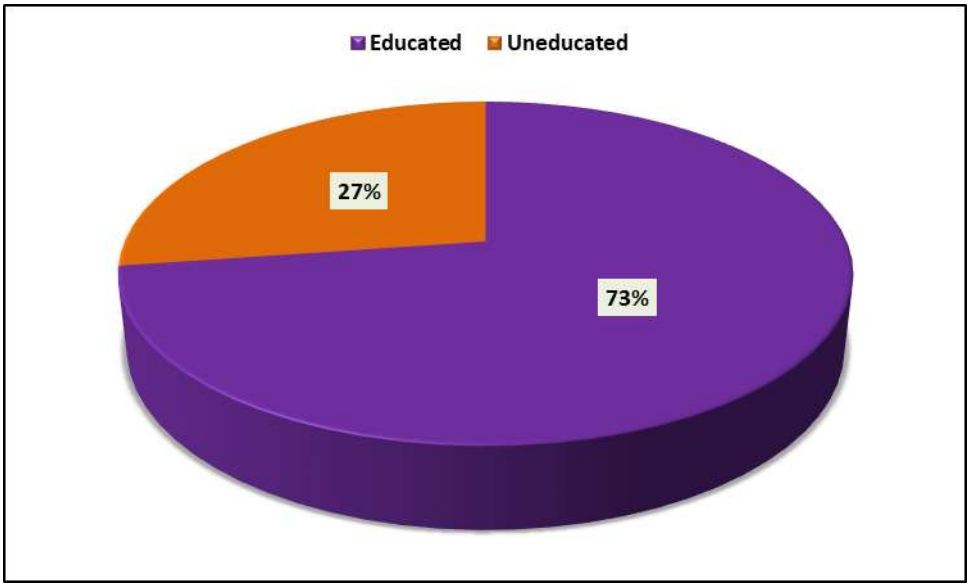


Table No. 9: Distribution According to Type of Diet.

Variable		No.	%
Type of Diet	Mixed Diet	31	56.4%
	Veg	24	43.6%

In the present study, out of 55 patients, 56.4% were on mixed diet and 43.6% were on veg diet.

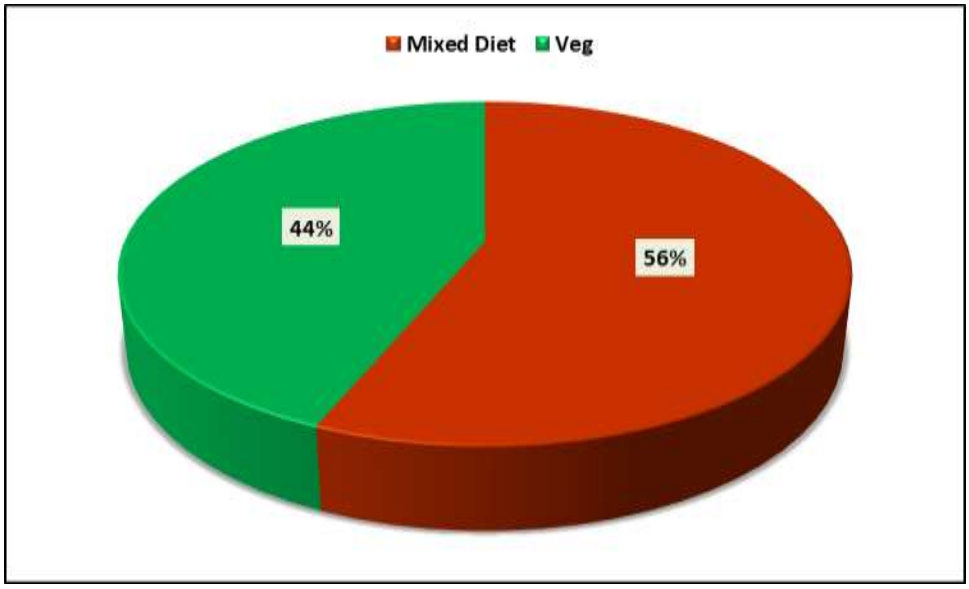


Table No. 10: Distribution According to Quality of Sleep.

Variable		No.	%
Quality of Sleep	Disturbed	27	49.1%
	Sound	28	50.9%

In the present study, out of 55% patients, 49.1% patients had disturbed sleep while 50.9% patients had sound sleep.

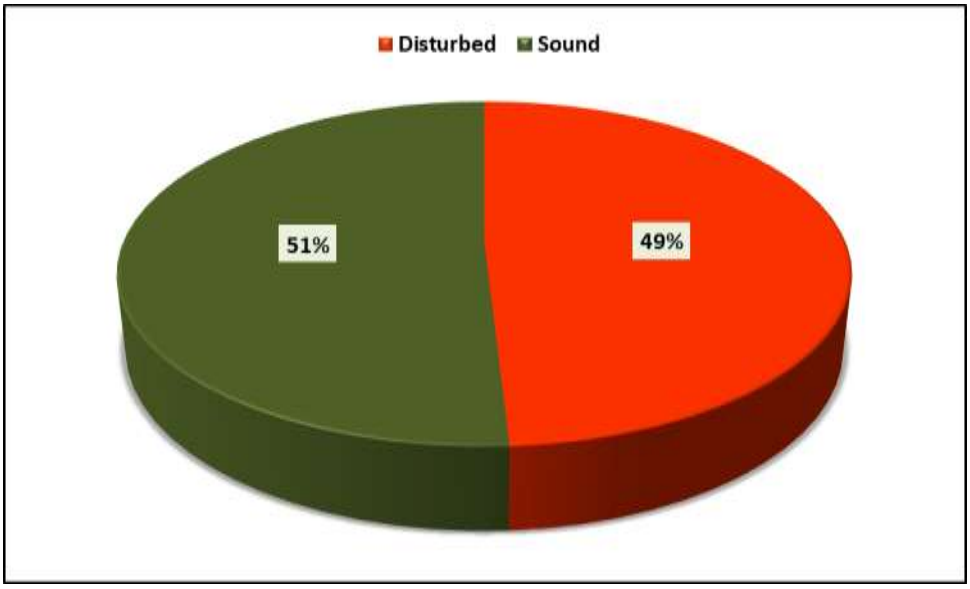


Table No. 11: Distribution According to Sleep Pattern.

Variable		**No.**	**%**
Sleep pattern	Irregular	31	56.4%
	Regular	24	43.6%

In the present study, out of 55 patients, 56.4% had irregular sleep pattern while 43.6% had regular sleep pattern.

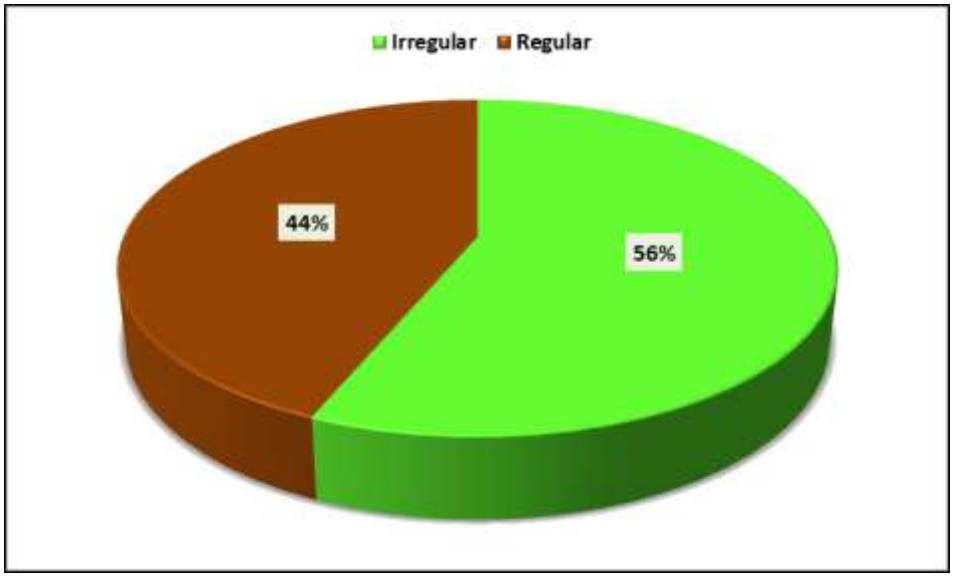


Table No. 12: Distribution According to Addiction.

Variable		No.	%
Addiction	Tea/Coffee	51	92.7%
	smoking	8	14.5%
	Alcohol	14	25.5%
	Tobacco/pan	10	18.2%

Out of the total 55 participants, the majority of individuals, 51 participants (92.7%), reported an addiction to Tea/Coffee.

14.5% reported smoking as an addiction, while 25.5% mentioned being addicted to Alcohol, 18.2% reported having an addiction to Tobacco/Pan.

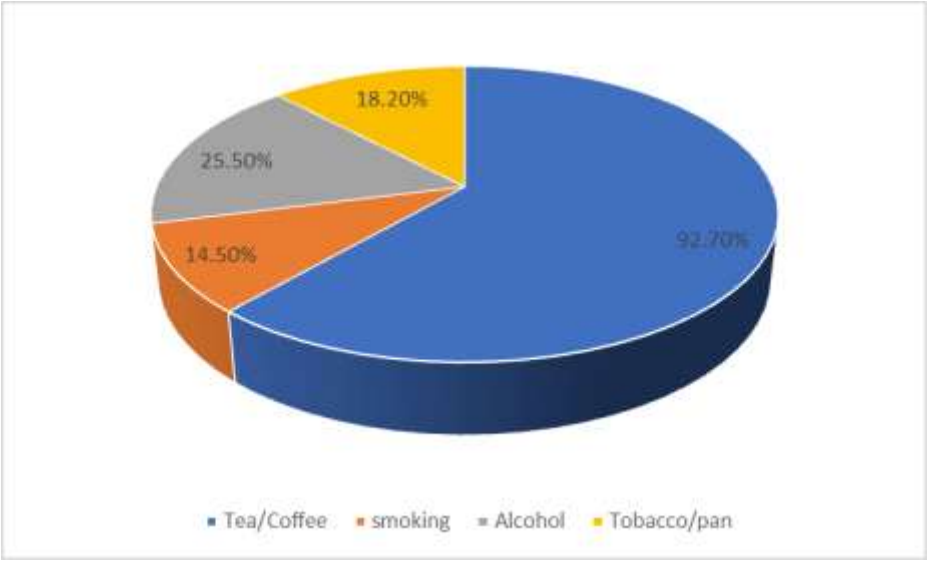


Table No. 14: Distribution According to Bowel Habit.

Variable		No.	%
Bowel habit	Sticky	21	38.2%
	Hard	22	40.0%
	Normal	20	36.4%

The table illustrates the distribution of participants based on their reported bowel habits, categorized into "Hard," "Normal," and "Sticky." Out of the total 55 participants, 38.2% mentioned having "sticky" bowel habits, while 40.0% mentioned having "Hard" bowel habits and 36.4% reported having "Normal" bowel habits.

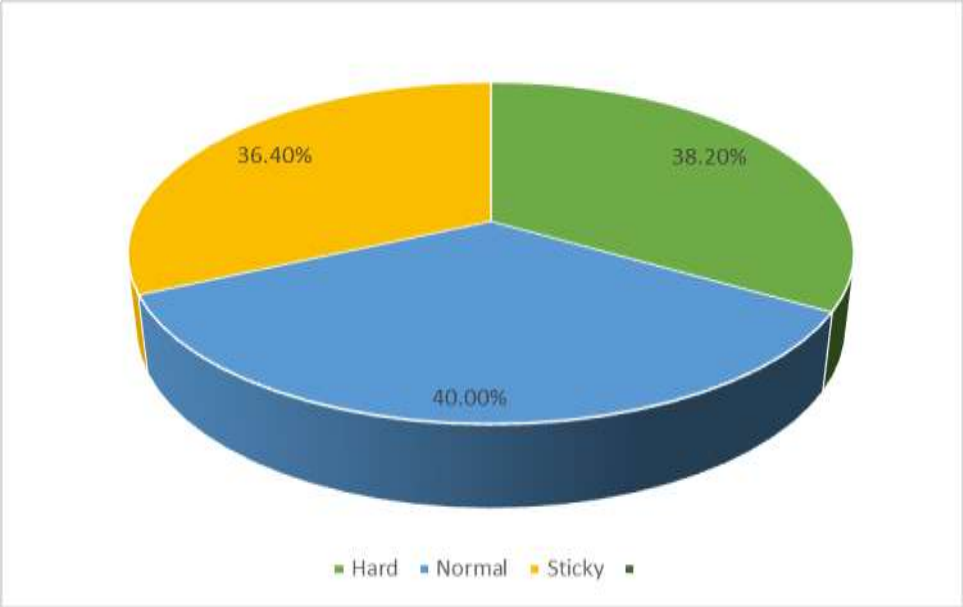


Table No. 15: Distribution According to Mental status.

Variable		No.	%
Mental status	Anxiety	29	52.7%
	Aggressive	24	43.6%
	Depression	14	25.5%
	Normal	23	41.8%

In the present study, out of 55 patients, 52.7% patients were having Anxiety issues followed by 43.6% patients were having Aggressive behaviour, 25.5% patients were having Depression and 41.8% patients were having Normal mental status.

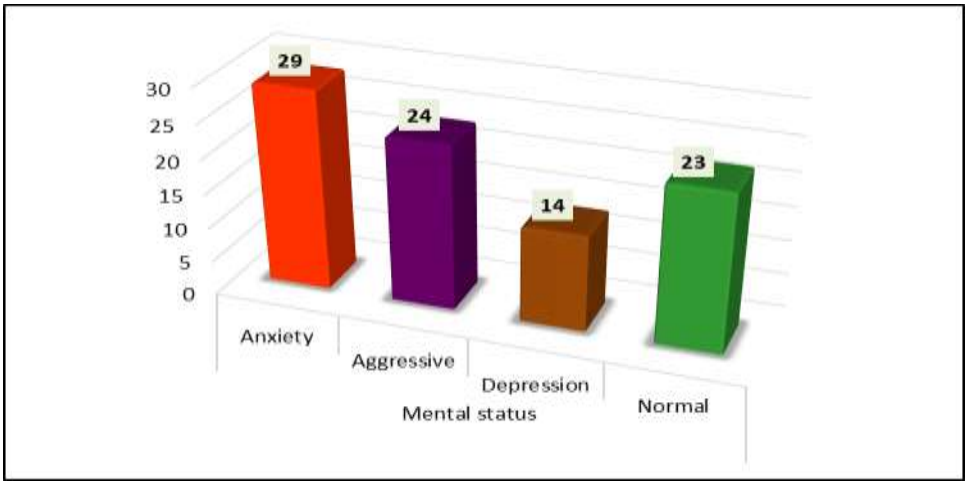


Table No. 16: Distribution According to Sharira Prakriti.

Variable		No.	%
Sharira Prakruti	Vata-pittaja	22	40.0%
	Vata-kaphaja	18	32.7%
	Pitta-Kaphaja	15	27.3%

In the present study, out of 55 patients, 40% patients were having vata-pittaja prakriti followed by vata-kaphaja prakriti (32.7%) followed by pittaja- kaphaja prakriti (27.3%).

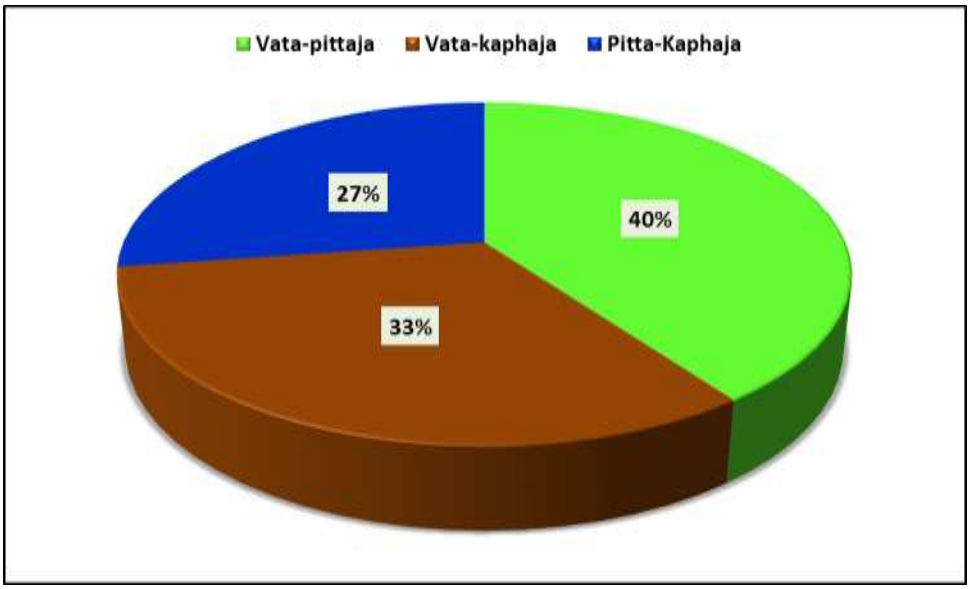


Table No. 17: Distribution According to Mansika Prakriti.'

Variable		No.	%
Mansika Prakruti	Satvika	0	0.0%
	Rajasika	31	56.4%
	Tamasika	24	43.6%

In the present study, out of 55 patients, 56.4% patients were having rajasika prakriti and 43.6% were having tamasika prakriti, whereas none of the patients were satvika in nature.

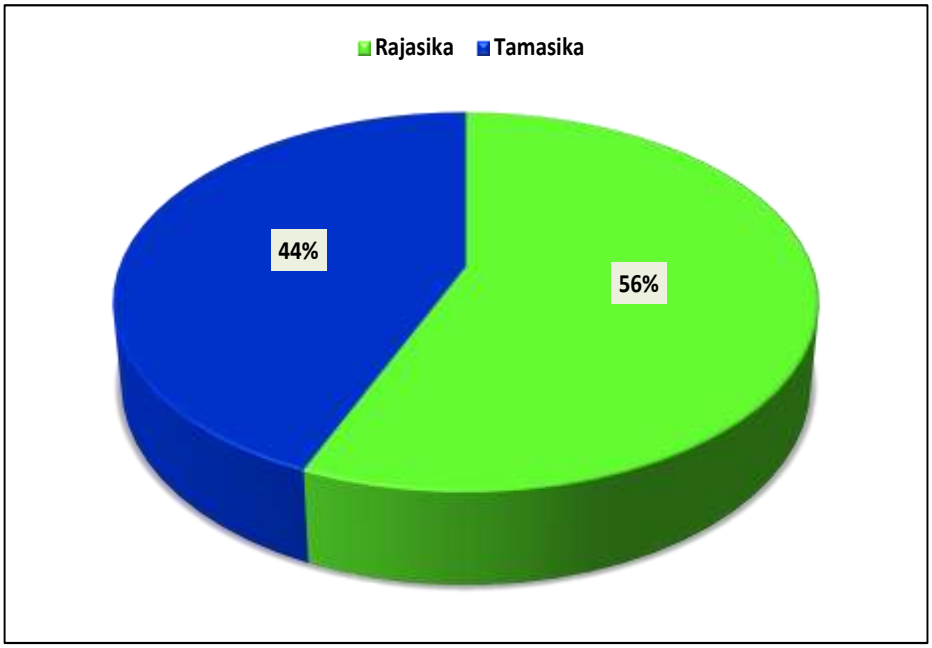


Table No. 18: Distribution According to Aharaj Nidan.

Variable		No.	%
Aharaj Nidan	amladi atisevan	37	67.3%
	lavanadi atisevan	36	65.5%
	ksharadi atisevan	32	58.2%
	Snigdhadi atisevan	35	63.6%
	Masha atisevan	38	69.1%
	ushnadi atisevan	44	80.0%
	Mulaka	33	61.1%
	Shuska Mamsa	12	21.8%
	Ambuja mamsa	20	36.4%
	Anupa mamsa	22	40.0%
	Kulattha	10	18.2%
	viruddha ahara	41	74.5%
	adhyasana	38	69.1%
	Ajirna bhojan	38	69.1%
	Nispava	47	85.5%
	Ikshu	19	34.5%

The distribution of participants based on their Aharaj Nidan (dietary habits and consumption) revealed a diverse pattern: 67.3% of participants practiced amladi atisevan (consuming sour and acidic foods), 65.5% followed lavanadi atisevan (consumption of salty foods), 58.2% engaged in ksharadi atisevan (intake of alkaline substances), 63.6% adopted Snigdhadi atisevan (consumption of oily and fatty foods), 69.1% included Masha (black gram) in their diet, 80.0% consumed ushnadi atisevan (heat-producing foods), 61.1% incorporated mulaka (radish) into their meals, while smaller percentages included Shuska Mamsa (dried meat, 21.8%), Ambuja mamsa (aquatic meat, 36.4%), Anupa mamsa (marshy land animal meat, 40.0%), and Kulattha (horse gram, 18.2%) in their diets. Moreover, 74.5% reported consuming viruddha ahara (incompatible foods), 69.1% practiced adhyasana (overeating), and 69.1% experienced Ajirna bhojan (indigestion). Notably, 85.5% participants followed Nispava (post-meal regimens), while 34.5% included Ikshu (sugarcane) in their diet. This diverse distribution highlights the wide array of dietary habits and practices within the study cohort.

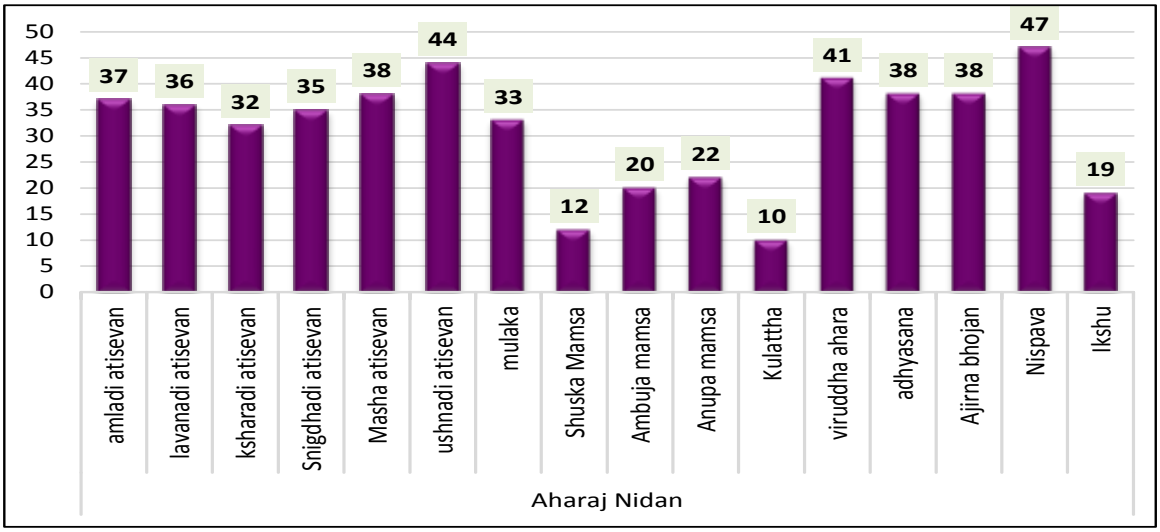


Table No. 19: Distribution According to Viharaj Nidan.

Variable		No.	%
Viharaja Nidana	Divaswapna	42	76.4%
	Plavana	47	85.5%
	atimaithun	54	98.2%
	vegadharana	27	49.1%

In the present study, out of 55 patients, 76.4% reported Divaswapna (daytime sleep), 85.5% engaged in Plavana (excessive swimming), 98.2% practiced atimaithun (excessive sexual activity), and 49.1% reported vegadharana (suppression of natural urges).

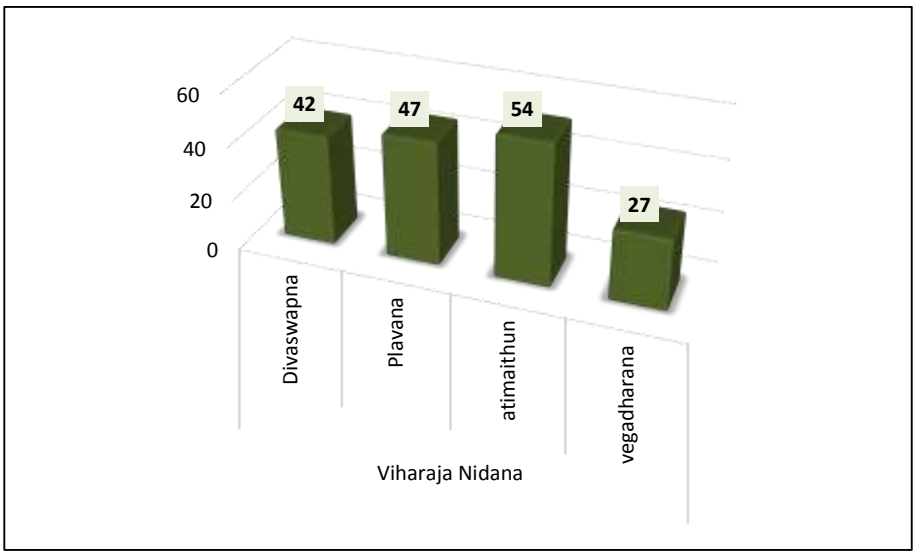


Table No. 20: Distribution According to Mansika Nidan.

Variable		No.	%
Mansika Nidan	Atikrodh	21	38.2%
	Atibhaya	18	32.7%
	Other	17	30.9%

In the present study, out of 55 patients, 38.2% reported Atikrodh (excessive anger), 32.7% experienced Atibhaya (excessive fear), and 30.9% mentioned.

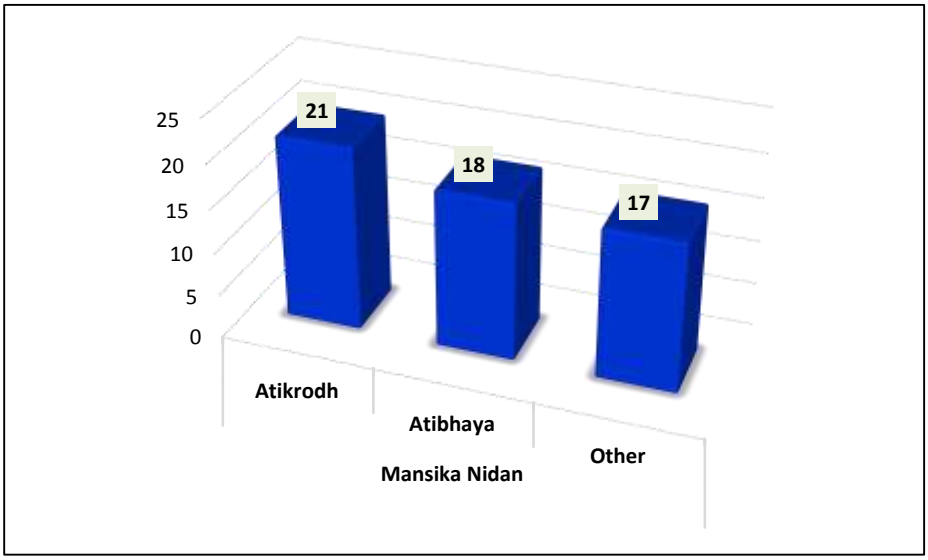


Table No. 21: Distribution According to Other Nidana.

Variable		No.	%
Other Nidana	Sukumara	35	63.6%
	Sthula	48	87.3%
	Pleasurable	29	52.7%
	Achankramanashila	16	29.1%

In the present study, out of 55 patients, 63.6% attributed their condition to Sukumara, 87.3% connected to Sthula body,

52.7% associated with Pleasurable factors, and 29.1% mentioned Achankramanashila.

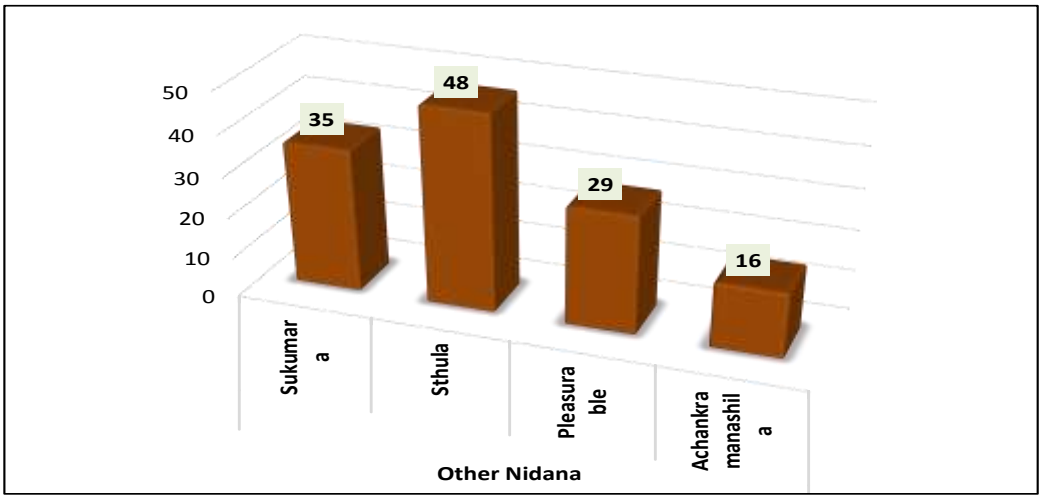


Table No. 22: Distribution According to Risk Factor.

Variable		No.	%
Risk factor	Age	55	100.0%
	Gender	29	52.7%
	Genetics	18	32.7%
	lifestyle choice	40	72.7%
	Medication	55	100.0%
	recent trauma or surgery	14	25.5%
	other health problems	9	16.4%

In the present study, among 55 individuals (100.0%) reported "age" as a risk factor.
52.7% reported "gender" as a risk factor, 32.7% reported "genetics" as a risk factor.
Lifestyle choices were reported by 72.7% as a risk factor. Unhealthy lifestyle choices, such as poor diet, lack of exercise, smoking, and excessive alcohol consumption, can increase the risk of various health problems.100% reported "medication" as a risk factor. 25.5% reported "recent trauma or surgery" as a risk factor.16.4% reported "other health problems" as a risk factor.

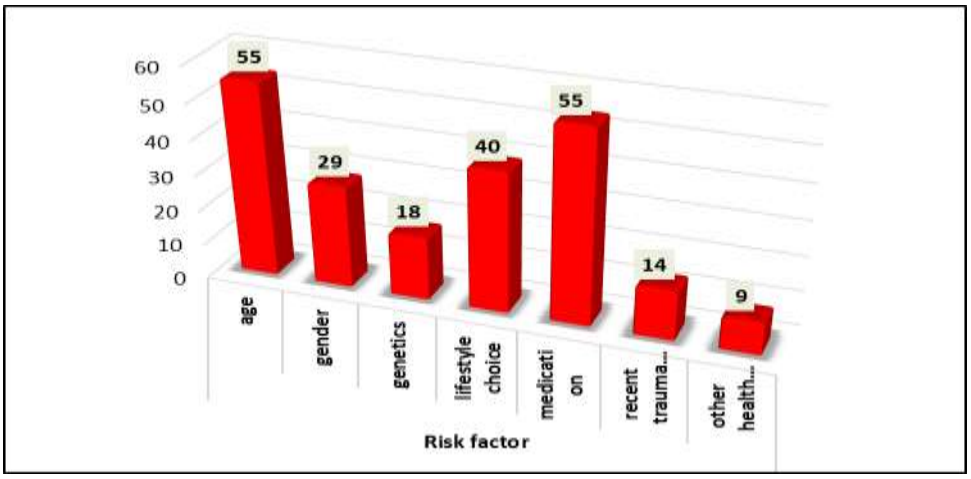
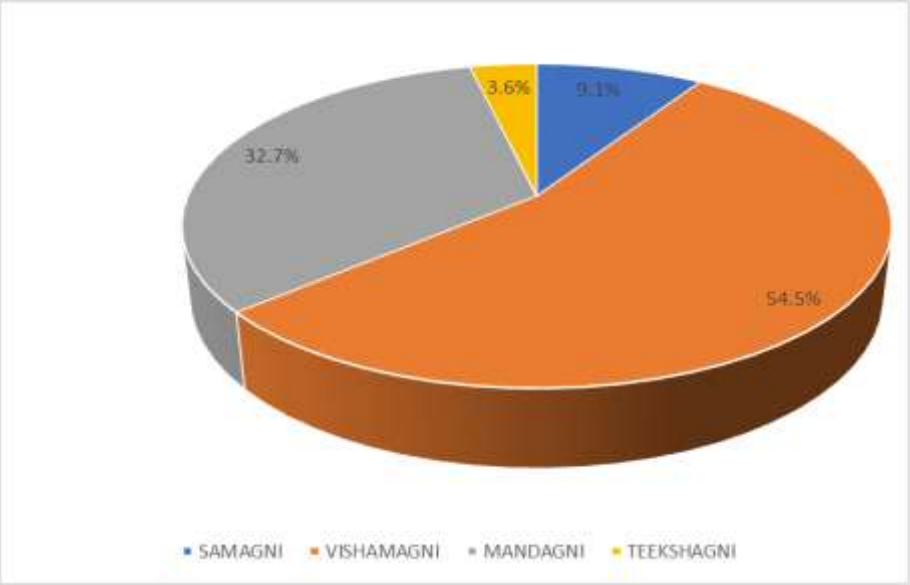


Table No. 23: Distribution According to Agni.

Variable		No.	%
Agni	SAMAGNI	5	9.1%
	MANDAGNI	18	32.7%
	VISHAMAGNI	30	54.5%
	TEEKSHAGNI	2	3.6%

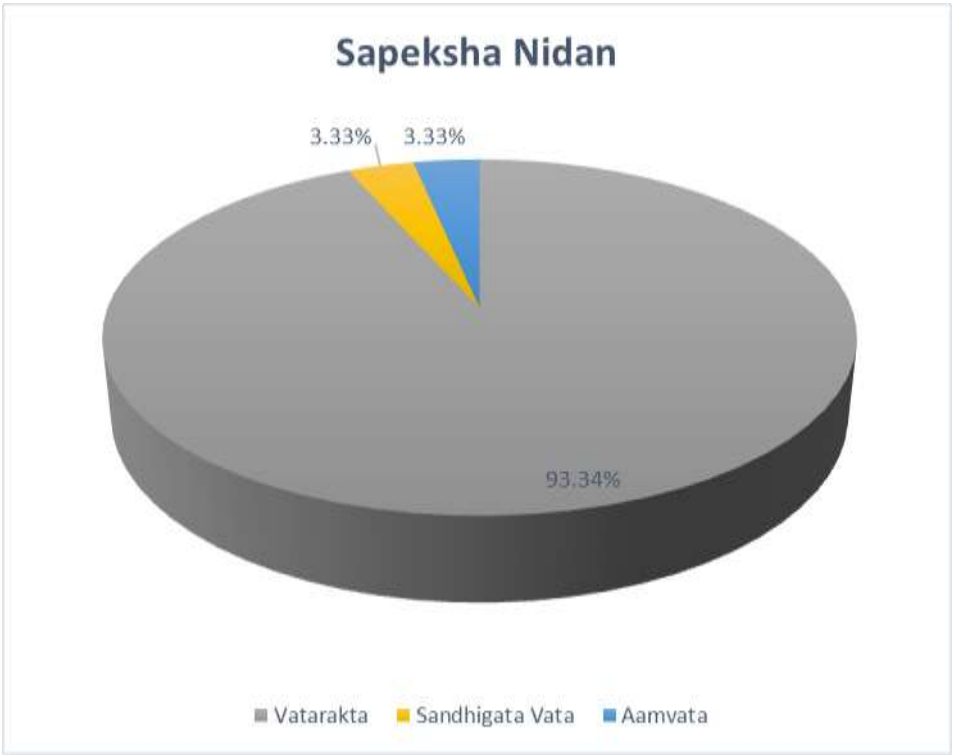
In the present study, out of 55 patients, 9.1% are classified as having Samagni, which represents a balanced and optimal digestive fire. 54.5% fall under the Mandagni category, indicating a relatively weak digestive fire. 32.7% are categorized as Vishamagni, representing irregular digestion, while a3.6% have were having teekshagni, implying an excessively strong or intense digestive fire.



DIFFERENTIAL DIAGNOSIS (Sapeksha Nidana)

Differential diagnosis	No.of patients	Percentage (%)
Vatarakta	56	93.34%%
Sandhigata Vata	2	3.33%%
Aamvata	2	3.33%

In the present study, Vatarakta found in maximum number of patients (93.34%) along with that, 3.33% of Sandhigata Vata and Aamvata. These (Aamvata, Vatarakta) were excluded in this study.



RESULTS

Subjective and objective Parameters

In the present study, 55 patients suffering from Vatarakta / Gouty arthritis were selected according to inclusion and diagnostic criteria. The subjective and the objective symptoms included were.

Vasadi Kwatha was administered in the dosage of 50 ml BD after the food for four weeks and the symptoms were assessed. Serum uric acid test was conducted at the end of the treatment and the analysis again done with the Wilcoxon test, a non-parametric statistical test, to compare paired samples and to analyze the change in serum uric acid levels.

Table No.1: Significance of Changes in Sandhishula After the Treatment.

Time	Sandhishula		Wilcoxon test	
	Mean	SD	z-value	p-value
BT	2.20	0.730	-6.57	**<0.001**
AT	0.60	0.683		
% change	72.73			

The p-value associated with this test was found to be <0.001, confirming the statistical significance of the results.

Overall, the treatment led to a remarkable 72.73% reduction in "Sandhishula" pain scores, underscoring its efficacy in providing relief from joint pain.

Table No. 2: Significance of Changes in Daha After the Treatment.

Time	Daha(Burning sensetion)		Wilcoxon test	
	Mean	SD	z-value	p-value
BT	0.29	0.533	-3.42	**0.001**
AT	0.02	0.135		
% change	93.75			

The associated p-value was found to be 0.001, reinforcing the statistical significance of the results.

Overall, the treatment resulted in an impressive 93.75% reduction in "Daha" scores, highlighting the efficacy of the intervention in alleviating burning sensations.

Table No. : 3 Significance of Changes in Sandhishotha After the Treatment.

Time	Toda		Wilcoxon test	
	Mean	SD	z-value	p-value
BT	0.65	0.726	-4.46	**<0.001**
AT	0.15	0.405		
% change	77.78			

The percentage change in Sandhisotha scores after treatment was calculated to be 77.78%, indicating a substantial improvement in pain in the study participants following the treatment.

Table No. 4: Significance of Changes in Sparshasahatwa After the Treatment.

Time	Sparshasahatwa		Wilcoxon test	
	Mean	SD	z-value	p-value
BT	0.55	0.662	-4.67	**<0.001**
AT	0.05	0.229		
% change	90.00			

Overall, the treatment resulted in an impressive 90.00% reduction in "Sparshasahatwa" scores, highlighting the efficacy of the intervention in alleviating sensitivity to touch. The associated p-value was found to be less than 0.001, underscoring the statistical significance of the results.

Table No. 5: Significance of Changes in Joint deformity After the Treatment.

Time	Joint deformity		Wilcoxon test	
	Mean	SD	z-value	p-value
BT	0.18	0.389	-1.41	0.157
AT	0.15	0.356		

The associated p-value was found to be 0.157, indicating that the change in joint deformity scores did not reach statistical significance at the standard significance level of 0.05.

Table No. 6: Significance of Changes in Typhus formation After the Treatment.

Time	Typhus formation		Wilcoxon test	
	Mean	SD	z-value	p-value
BT	0.22	0.417	0.00	1.000
AT	0.22	0.417		
% change	0.00			

The percentage change in typhus formation scores after treatment was calculated to be 0.00%, confirming that there was no change in the severity of typhus formation following the treatment.

Table No. 7: Significance of Changes in Toda(pricking pain) After the Treatment.

Time	Toda		Wilcoxon test	
	Mean	SD	z-value	p-value
BT	0.98	0.871	-5.34	**<0.001**
AT	0.09	0.290		
% change	90.74			

Overall, the treatment resulted in an impressive 90.74% reduction in Toda. The associated p-value was found to be less than 0.001, underscoring the statistical significance of the results.

Table No. 8: Significance of Changes in Raga After the Treatment.

Time	Raga		Wilcoxon test	
	Mean	SD	z-value	p-value
BT	0.25	0.440	-3.16	**0.002**
AT	0.07	0.262		
% change	71.43			

The percentage change in redness scores after treatment was calculated to be 71.43%, indicating a substantial improvement in redness in the study participants following the treatment.

Table No. 10: Significance of Changes in Kandu After the Treatment.

Time	Kandu		Wilcoxon test	
	Mean	SD	z-value	p-value
BT	0.48	0.790	-2.83	**0.005**
AT	0.27	0.591		
% change	42.21%			

The percentage change in itching scores after treatment was calculated to be 42.21%.

Table No. 11: Significance of Changes in Aakunchana After the Treatment.

Time	Akunchana-prasarnajanya Vedana (FLEXION AND EXTENSION)		Wilcoxon test	
	Mean	SD	z-value	p-value
BT	0.75	0.799	-4.81	**<0.001**
AT	0.29	0.497		
% change	60.98			

The percentage change in Akunchana scores after treatment was calculated to be 60.98%, indicating a considerable improvement in Akunchana among the study participants following the treatment.

Table No. 12: Significance of Changes in Shyawata(Skin discolouration) After the Treatment.

Time	Shyawata		Wilcoxon test	
	Mean	SD	z-value	p-value
BT	0.47	0.790	-2.84	**0.005**
AT	0.27	0.592		
% change	42.31			

The mean score of Syawata(discolouration) before treatment was 0.47 which is reduced to 0.27 after the treatment. The statistical analysis showed the improvement was significant (P=0.005).

Table No. 13: Significance of Changes in Sandhigraha (Stiffness) After the Treatment.

Time	Sandhigraha		Wilcoxon test	
	Mean	SD	z-value	p-value
BT	1.87	0.771	-6.26	**<0.001**
AT	0.84	0.788		
% change	55.34			

The percentage change in stiffness scores after treatment was calculated to be 55.34%, signifying a significant improvement in stiffness among the study participants following the treatment.

Overall Summary of Comparisons of Subjective Parameters Before and After Treatment

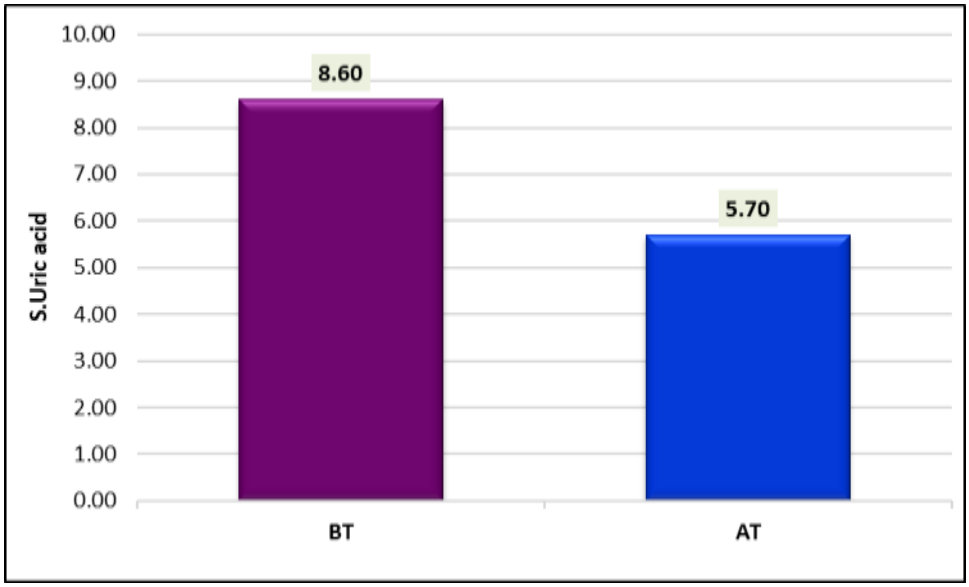
Parameter	Before trial		After trial		%	Wilcoxon test		
	Mean	SD	Mean	SD	change	z-value	p-value	RESULT
Sandhishula	2.20	0.730	0.60	0.683	72.73	-6.57	**<0.001**	**HS**
Daha	0.29	0.53	0.02	0.135	93.75	-3.42	**0.001**	**HS**
Sandhishotha	0.98	0.871	0.09	0.290	90.74	-5.34	**<0.001**	**HS**
Sparshaashatva	0.65	0.15	0.726	0.405	77.78	-4.46	**<0.001**	**HS**
Raga	0.25	0.07	0.440	0.262	71.43	-3.16	**0.002**	**S**
Toda	0.05	0.662	0.05	0.229	90.00	-4.6	**<0.001**	**HS**
Kandu	0.48	0.27	0.790	0.59	42.21	-2.83	**0.005**	**S**
Joint deformity	0.18	0.356	0.15	0.356	20	-1.41	**0.157**	**NS**
Typhus formation	0.22	0.417	0.22	0.417	00	00	**1.000**	**NS**
Prasarana akunchan Vedana	0.75	0.29	0.799	0.497	60.98	-4.81	**<0.001**	
Shyawata	0.47	0.27	0.790	0.592	42.31	-2.84	**0.005**	
Sandhigraha	1.87	0.771	0.84	0.788	55.34	-6.26	**<0.001**	**HS**

In Subjective parameter, maximum percentage i.e, 93.75%, marked improvement was observed in Daha, (90.74%) marked improvement was observed in sandhishotha, 90% marked improvement was observed in Toda, 71. 43% moderate improvement was observed in Raga, 72.73% moderate improvement was observed in sandhidhula, Moderate improvement was observed in prasarana akunchana janya vedana and sandhigraha, while shyawata, kandu shows mild improvement. There is no significant improvement in typhus formation and joint deformity.

Table No. 14: Objective parameter Significance of Changes in S.Uric Acid After the Treatment.

Time	S.Uric acid		paired t test	
	Mean	SD	t-value	p-value
BT	8.60	0.651	11.75	**<0.001**
AT	5.70	2.257		
mean change	2.90	1.83		

The data presents the results of a paired t-test comparing serum uric acid levels at two different time points: Before Treatment (BT) and After Treatment (AT). The mean change of 2.90 suggests a substantial decrease in uric acid levels following the treatment, as evidenced by the highly significant p-value of less than 0.001. This indicates the effectiveness of the treatment in reducing serum uric acid levels.

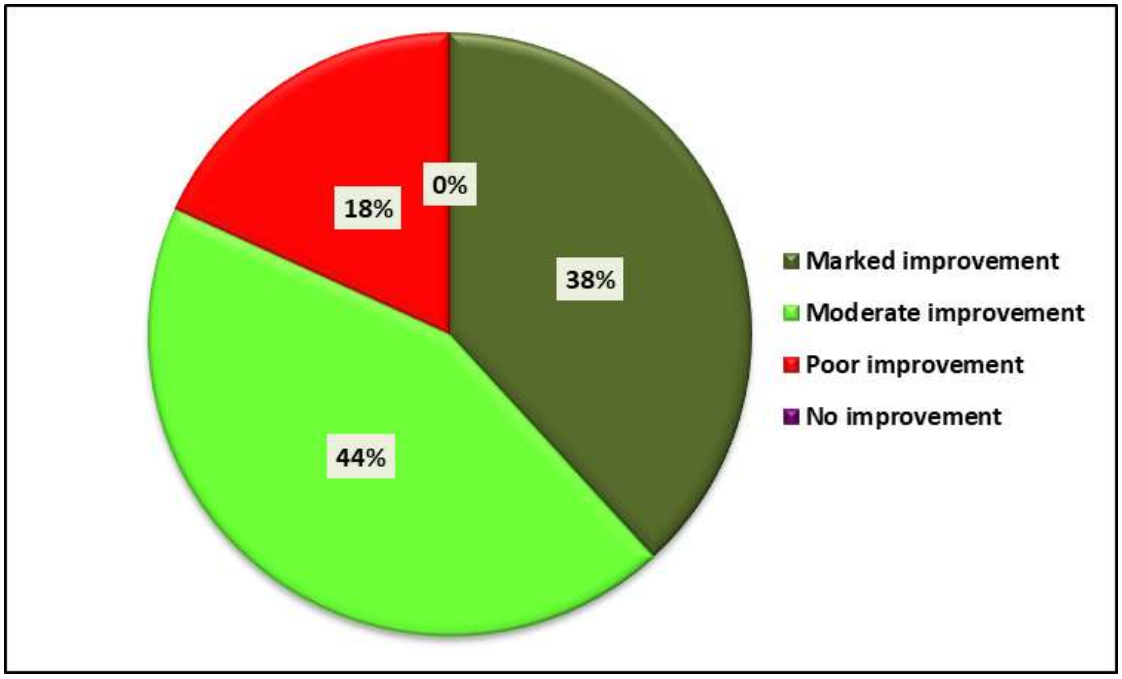


In the present clinical study, there is marked improvement in the reduction of serum uric acid level i.e, >2.5mg/dl, which shows the present clinical trial is highly significant.

Table no. 15: Overall effect of therapy.

Variable		No.	%
Overall Result	Marked improvement(>75%)	21	38.2%
	Moderate improvement (50-75%)	24	43.6%
	Poor improvement (25-49%)	10	18.2%
	No improvement (<25%)	0	0.0%

Among the 55 patients, 38.2% experienced marked improvement in their condition, while 43.6% reported moderate improvement, 18.2% were noted mild improvement.



DISCUSSION

DISCUSSION ON DEMOGRAPHIC DATA

The patients were ranging from 30 to 60 years. The patients set was spread over entire range of considered age limits. Maximum 14.5% patients were in the age of 20–29 years. There were roughly 21.8% of patients from each age group of 40-49 years. The highest age group

considered (30-39 years) in this study had 36.% representation. In the present study, out of 55 patients, 56.4% were Male and 43.6% were Female. 76.4% belongs to Hindu religion and 23.6% belongs to muslim region. In present study maximum no. of patients i.e 30.9% were Housewife, 25.5% Patients were Serviceman, 10.9% patients are Student, 16.4% patients related to Agriculture, 10.9% patients are Businessman and 5.5% patients are Labour. 89.1 % were married and 10.9% were unmarried. 45.5% belongs to rural area and 54.5% belongs to urban. 21.8% fall under the lower class category, while 50.9% belongs to the middle class and 27.3% belongs to upper class.72.7% were educated and 27.3% were uneducated.

56.4% were on mixed diet and 43.6% were on veg diet. 49.1% patients had disturbed sleep while 50.9% patients had sound sleep. 56.4% had irregular sleep pattern while 43.6% had regular sleep pattern.

DISCUSSION ON MENTAL STATUS

52.7% patients were having Anxiety issues followed by 43.6% patients were having Aggressive behaviour, 25.5% patients were having Depression and 41.8% patients were having Normal mental status.

DISCUSSION ON PRAKRITI (sharirika and manasika)

Analyzing the sharirika prakriti, it was reported that 40.0% exhibited Vata-pittaja constitution, while 32.7% had Vata-Kaphaja and 27.3% showed Pitta-Kaphaja constitution. All the patients included in the study found to have dwandwaja prakriti with predominance of vata pittaja and vata kaphaja prakriti suggesting the susceptibility of these patients to Vatarakta.

Analyzing the manasa prakriti, majority of the patients had rajasa prakriti (56.4%) followed by tamasa prakriti (43.6%). According to Ayurvedic texts, vata is preponderate in rajoguna, and rajoguna itself provokes vata and may be a factor in manifestation of this disease.

DISCUSSION ON OTHER ETIOLOGICAL FACTORS

- 76.4% reported Divaswapna (daytime sleep), 85.5% engaged in Plavana (excessive swimming), 98.2% practiced atimaithun (excessive sexual activity), and 49.1% reported vegadharana (suppression of natural urges). 38.2% reported Atikrodh (excessive anger), 32.7% experienced Atibhaya (excessive fear), and 30.9% mentioned. 63.6% attributed their condition to Sukumara, 87.3% connected to Sthula body, 52.7% associated with Pleasurable factors, and 29.1% mentioned Achankramanashila.
- The majority of patients (92.5%) had addictions to tea and coffee, 25% had addictions to tobacco and nicotine, 15% had addictions to alcohol, and 20% had addictions to smoking. In this study, maximum patients having daily routine habits of taking tea/ coffee which do not shows very significant role in causing Vatarakta.
- On the other hand, alcohol consumption followed by tobacco/pan further followed by smoking shows significant role in causing the illness. The Madya sevana (alcohol consumption) causes pitta, rakta and vata dushti along with aggravating the tamasika and rajasika gunas, which plays crucial role in the pathogenesis of Vatarakta.
- Tobacco/ pan contains nicotine, due to its vyavayi and ruksha guna, and also the kasaya rasa dominance of nicotine, responsible for the vitiation of Vata dosha.
- Cigarette smoking can cause vitiation of rakta and pitta dushti, which can further leads to the illness.
- The present study has shown negative family history. Despite the fact that hereditary predisposing factors for gout are addressed in modern research. However, as the sample size was smaller, therefore, no conclusion can be made.

DISCUSSION ON AGNI STATUS

9.1% are classified as having Samagni. 54.5% fall under the vishamagni category. 32.7% are categorized as mandagni, representing irregular digestion, while a 3.6% have were having teekshagni.

DISCUSSION RELATED TO DIETARY HABITS (observation)

- The distribution of participants based on their Aharaj Nidan (dietary habits and consumption) revealed a diverse pattern: 67.3% of participants practiced amladi atisevan (consuming sour and acidic foods), 65.5% followed lavanadi atisevan (consumption of salty foods), 58.2% engaged in ksharadi atisevan (intake of alkaline substances), 63.6% adopted Snigdhadi atisevan (consumption of oily and fatty foods), 69.1% included Masha (black gram) in their diet, 80.0% consumed ushnadi atisevan (heat-producing foods), 61.1% incorporated mulaka (radish) into their meals, while smaller percentages included Shuska Mamsa (dried meat, 21.8%), Ambuja mamsa (aquatic meat, 36.4%), Anupa mamsa (marshy land animal meat, 40.0%), and Kulattha (horse gram, 18.2%) in their diets.74.5% reported consuming viruddha ahara (incompatible foods), 69.1% practiced adhyasana (overeating), and 69.1% experienced Ajirna bhojan (indigestion). 85.5% participants followed Nispava (post-meal regimens), while 34.5% included Ikshu (sugarcane) in their diet. This diverse distribution highlights the wide array of dietary habits and practices within the cohort study.

DISCUSSION ON ETIOLOGICAL FACTORS (DIETARY FACTORS)

This is well cleared by Acharya Chakrapani that aetiological factors started from intake of **saline (Lavnadi)** are the aggravating factor of **Rakta dhatu** and aetiological factors initiated from intake of **astringent (Kashayadi)** are predominately causes aggravation of Vata . Combination of these two types of aggravating factor leads to Vatarakta.

- **Lavana Rasa:** Both Vatarakta and gouty arthritis are influenced by excessive consumption of salty foods. Salt contributes to dehydration, which can lead to gout attacks by hindering water excretion and preventing the flushing out of uric acid from the body.
- **Mulak, Kulath, Masha, Nishpaav:** These refers to pulses, radish, and legumes, which are rich in purines. In both Vatarakta and gouty arthritis, the metabolism of purines leads to the production of uric acid, which can accumulate and trigger symptoms.
- **Shaak (High Purine Vegetables):** Consumption of high purine vegetables like spinach or asparagus is associated with gout attacks in both Vatarakta and gouty arthritis.

NOTE : There is a positive association between protein from animal sources and prevalence of hyperuricemia and an inverse association between protein from plant sources and hyperuricemia. Seafood (fish and shellfish) intake was associated with higher prevalence of hyperuricemia.

- **Anoop Deshiya Mansa, Ambuja Mansa (Non-vegetarian Diet):** Seafood, such as salmon, mackerel, and red meat, which are rich in purines, can contribute to both Vatarakta and gouty arthritis.
- **Arnala, Souvira, Shukta, Sura, Asava (Fermented Drinks):** Alcohol consumption is considered a significant risk factor for both Vatarakta and gouty arthritis. It reduces urate excretion and increases urate production in the blood.
- **Dairy Products:** Curd, cheese and paneer are not recommended to consume regularly because they are heavy to digest and vitiates *Vata*, *Pitta*, *Kapha* and *Rakta.* Thus, regular and unscheduled consumption of dairy products specially curd, cheese and paneer leads to *vitiation of rakta and vata dosha.*
- **Mithyahara, Virudhhashan (Incompatible Diet):** Ingestion of certain foods or drinks stored or handled in lead-lined containers, as well as excessive intake of certain drugs like aspirin or diuretics, can contribute to gout attacks in both Vatarakta and gouty arthritis.
- **Annashana, Langhana (Starvation):** Starvation can lead to the body metabolizing its own purine-rich tissues, resulting in increased production of uric acid. Starvation also impairs kidney function, affecting uric acid excretion.
- **Shushkaahara (Toast, breads, chips, etc):** Excess intake of these cause dehydration leads to the retention of uric acid and other acidic wastes in the blood, contributing to hyperuricemia and gout attacks.
- **Ikshu, Mishthanna Bhojana (Fructose-Rich Diet):** Consumption of fructose-rich foods and beverages, such as fruit juices and sweetened sodas, can increase uric acid production and contribute to gout attacks in both conditions.
- **Achankramana (Sedentary Lifestyle):** Vatarakta and gouty arthritis are more prevalent among individuals with sedentary lifestyles.
- **Ativyayam, Ativyavaya (Excessive Muscle Exertion):** Excessive muscle exertion, particularly heavy work, can increase the degradation of ATP into AMP, leading to elevated uric acid levels and triggering gout attacks.
- **Abhighataja (Trauma):** Trauma or physical injury is a known trigger for gout attacks.
- **Sthoulya (Obesity):** Obesity is a significant risk factor for both Vatarakta and gouty arthritis. Body Mass Index (BMI) has been identified as a predictor for the development of gout.

CONCLUSION AND SUMMARY

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

- Vatarakta and Gouty arthritis are comparable in terms of their symptoms, frequency, onset, and character, according to research from both ayurvedic and contemporary literature. Vatarakta primarily appears in men between the ages of 30-50 years.
- It is undeniable that several etiological variables are crucial in the vitiation of the Vata and Rakta dhatus, and that as the disease develops, it results in the ailment known as Vatarakta. An alternative pathophysiology is found inside its two tier samprapti, whereby the kapha and medo dhatu obstructs the passage of Vayu leading to Vatarakta.
- Vatarakta is a disease which primarily effects pada-mula sandhi (big toe), likewise Gouty arthritis too affects the small joints of our body, mostly the meta-tarsophalangeal joint
- Vatarakta mainly affects the small joints followed by large joints. Sandhi is a marma, comes under madhyam and bahya roga marga that primarily affects the middle aged groups, therefore it is regarded as kasta sadhya or yapya vyadhi.
- Among the cardinal symptoms, maximally encountered symptoms were sandhisotha, sandhishula, toda, burning sensation, sparshaashatava.
- From the etiological factor, it is very much cleared, the patients indulged with faulty diet and lifestyle along with Vishamasana, sthoola body, Sukumar prakriti and Achakramansheela (not willing to do any physical work) suffers the most from the illness.
- In the present study, who has not followed strictly the healthy lifestyle, not respond to treatment very well because ayurveda emphasizes to proper follow healthy diets and lifestyles along with medications for treating the illness.
- Throughout the whole trial and the follow-up period, no significant side effects of the medication were seen.
- Based on the subjective and objective criteria, the effect of Vasadi kwatha has been shown overall positive effect.
- Administration of Vasadi Kwath is relatively safe

and cost-effective treatment modality for management of Vatarakta.

- During the course of the trial, there is no such complications were noted.
- Therefore, On the basis of the present clinical study it can be concluded that Vasadi kwatha possesses the anti-inflammatory, antioxidant, analgesic, anti-rheumatic properties and is found effective in the management of Vatarakta.
- It has been shown significant improvement (81.8%) in the sign and symptoms of vatarakta. Further the drug requires to be tried on a larger number of cases. The study may also be conducted with varying doses, combinations and duration of treatment.
- Overall effect of therapy suggests moderate and marked improvement in maximum sign and symptoms which has been taken as the diagnostic tool. Satisfactory results are obtained in patients of Vatarakta vis-à-vis goutyarthritis, therefore it can be concluded that the given treatment proves to be an effective remedy for Vatarakta.
- In this way the statistical analysis of this clinical study reveals "The clinical trial drug vasadi kwatha is very much effective in the management of vatarakta (gouty arthritis)".

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