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To evaluate the effect of *Panchaprasrutika Basti* with and without *Anuvasana* in *Janusandhigata Vata* - A Comparative Clinical Study

Sucheta Desai[1], Shaila Borannavar[2], Ananta S. Desai[3]

[1]*Post Graduate Scholar, Department of PG Studies in Panchakarma, Govt. Ayurveda Medical College, Bangalore, Karnataka, India.*

[2]*Guide & Associate Professor, Department of PG Studies in Panchakarma, Govt. Ayurveda Medical College, Bangalore, Karnataka, India.*

[3]*Professor & HOD, Department of PG Studies in Panchakarma, Govt. Ayurveda Medical College, Bangalore, Karnataka, India.*

ABSTRACT

Basti is considered as *Ardha* or *Purna Chikitsa* among the entire *Panchakarma* therapeutic measures. In *Asthi Ashrita Vyadhi Panchakarma* especially *Basti Karma* is *Hitakari. Sandhigata Vata* is one among the *Vataja Nanatmaja Vyadhi* mainly manifesting in *Vridhdhavastha*, which is dominated by *Vata Dosha*. *Acharya Sushruta* said it is difficult to cure and is *Yapya. Charakacharya* has explained that for the management of the diseases at *Marmaasthi Sthanas, Vata Dosha* is treated. Since *Basti* is considered the most effective for the management of *Vata.* Hence the present study "To evaluate the effect of *Panchaprasrutka Basti* with and without *Anuvasana* in *Janusandhigata Vata* - A Comparative Clinical Study, is undertaken here. **Methodology:** It is a comparative clinical study. 40 patients diagnosed as having *Janusandhigata Vata* fulfilling the inclusion criteria were selected from the OPD and IPD, SJIIM Hospital and GAMC Bengaluru and randomly assigned into following 2 groups each comprising of 20 patients. A special case proforma was prepared with all the points of History taking, physical examinations, laboratory investigations to confirm the diagnosis as mentioned in our classics and contemporary sciences. **Group A:** Patients of this group were given a course of *Panchaprasrutika Basti* with *Anuvasana Basti.* **Group B:** Patients of this group were given a course of *Panchaprasrutika Basti* without *Anuvasana Basti.* Patients of both groups were administered *Basti in Yoga Basti* pattern. After completion of study, results were assessed using student's 't' test by comparing the data collected during the study. **Result:** Both the groups were effective in *Janusandhigata Vata*. However clinically efficacy of Group A (65%) showed better results than Group B (60%).

Key words: *Janusandhigata Vata, Panchaprasrutika Basti, Sandhishoola, Osteoarthritis, Anuvasana Basti, Yoga Basti.*

INTRODUCTION

Osteoarthritis (OA) is the most common type of arthritis in both developed and developing countries, affecting many people especially elderly and obese persons. It is a chronic, degenerative, progressive musculoskeletal disorder characterized by gradual loss of cartilage in joints which results in with evidence of accompanying peri-articular bone response in the form of bony overgrowths called osteophytes, bones rubbing together and clinically presenting as joint pain, stiffness and impaired movement. The disease most commonly affects the joints in the knees, hips, and spine. Since knee is a weight bearing joint, it is more susceptible to wear and tear. The disease is associated with modifiable and non-modifiable risk factors such as obesity, lack of exercise, genetic predisposition, bone density, occupational injury, trauma, and gender.

Address for correspondence:
Dr. Sucheta Desai
Post Graduate Scholar, Department of PG Studies in Panchakarma, Govt. Ayurveda Medical College, Bangalore, Karnataka, India.
E-mail: suchetateggi@gmail.com

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Osteoarthritis can be classified into two groups as primary and secondary. Primary osteoarthritis is a chronic degenerative disease and is related to aging. The water content of the cartilages decreases on increasing age, thus making them more susceptible to degradation. While secondary arthritis usually affects the joints earlier in life due to specific causes such as injury during a job requiring frequent kneeling or squatting for long duration, diabetes, obesity etc.

Osteoarthritis is a non-inflammatory form of arthritis and it is the most frequent joint disease, primarily affects elderly population with a prevalence of 22% to 39% in India.[1] OA is more common in women than men. It is a major cause of disability in older adults worldwide. Nearly, 45% of women over the age of 65 years have symptoms while 70% of those over 65 years show radiological evidence of OA.

The prevalence of OA is increasing due to population ageing and an increase in related factors such as obesity, sedentary life style in younger too. The physical disability arising from pain and loss of functional capacity reduces quality of life and increases the risk of further morbidity. As highly effective medicinal management is not available emphasis should be given to preventive aspect of life style measures in the form of healthy diet and exercise.

In Ayurveda OA of knee joint can be co-related with *Janusandhigatavata. Sandhigata Vata* is the one of the most common *Shoolapradhana Vataja Nanatmajavyadhi* which mainly occurs in *Vridhdhavastha* due to *Dhatukshaya* and other *Vataprakpoka Nidana*.

Main symptoms are *Vatapurnadritisparsha*[2] (swelling), *Prasaranakunchana Vedana* (pain on movement), *Sandhi Shoola* (pain in joint), *Atopa* (cracking sound) which limits daily life activities such as walking, standing, personal care etc.

In contemporary medical science administration of NSAID's, Corticosteroids, Topical Analgesics etc. gives temporary relief from pain but has its own adverse effects and in long run can pose increased risk of gastric erosion, hepatic and nephro toxicity. Surgery is the last resort for OA knee, which has several complications, and may even cause permanent loss of working capabilities.[3] However, a permanent relief is not provided by any of these and the same is still under research works that to be provided to this clinical mystery.

According to Ayurveda, the routes or the *Margas* of diseases are *Bahya, Madhyama* and *Abhyanthara.* The diseases affecting the *Madhyamarogamarga* may be either *Kashtasadhya* or *Asadhya.* Since *Sandhigatavata* affects the *Asthi* and *Sandhi* it can be included under *Madhyamarogamarga. Janu* is a *Sandhi Marma,* and is explained in *Charak Samhita* that for the management of the diseases at *Marmasthanas, Vatadosha*[4] is treated. Since *Basti* is considered the most effective for the management of *Vata*, *Basti* is considered as *Ardha* or *Purna Chikitsa* among the entire therapeutic measures. *Sandhigatavata,* an *Asthiashrita Vyadhi,* being a disorder with predominant involvement of *Vata* mainly aimed at *Brimhana Chikitsa* and for that in *Panchakarma* especially *Basti Karma* is *Hitakar.*[5] *Panchaprashrutika Basti* is one of the *Basti* under classification according to the dose of ingredients, this *Basti* is *Mrudu, Snehaniya, Vataghna, Balavarnakaraka* and indicated for *Sukumar.* From the above lines, it is clear that this type of *Basti* acts as *Shodhana, Shamana*, and *Brimhana* by virtue of specific drugs utilized in them hence it can be considered as a type of *Yapanabasti.*

The drugs used in this *Basti Karma* are minimal in number, economical and has no adverse effects. *Ksheera, Madhu, Taila, Ghrita* without addition of *Kalka* does *Tarpana* and *Brimhana* and helps to pacify *Ruksha* and *Khara Guna* of *Vata* and may help in arresting the progressive degenerative changes of the affected *Janusandhi.* Therefore, a sincere effort was made in this study to evaluate and compare the effect of *Panchaprasrutika Basti* with and without *Anuvasana* in management of *Janusandhigatavata* where in maximum treatment beneficiary was expected with low cost and ingredients.

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Materials and Methods

Source of the data

Subjects attending OPD and IPD of Shri Jayachamarajendra Institute of Indian Medicine and Hospital, Bengaluru were selected.

Methods of collection of data

40 patients fulfilling the diagnostic criteria were selected irrespective of sex, religion, marital status, socio economic status and were randomly distributed.

Diagnostic criteria

Signs and symptoms mentioned *in* Ayurveda for *Janu Sandhigatavata* were taken as the main criteria for diagnosis.

1. *Sandhi Shoola*
2. *Vata Poorna Druti Sparsha*
3. *Vedana* during *Prasarana* and *Akunchana*
4. *Sandhi Atopa*
5. X-ray knee joint.

Patients having minimum of two symptoms among above five along with *Sandhi Shoola* are diagnosed to have *Janusandhigata Vata.*

Inclusion Criteria

Patients presenting with classical signs & symptoms of *Janu Sandigata Vata* like:

1. Patients with *Janu Sandhi Shoola, Akunchana Prasarana Vedana, Sandhi Atopa*.
2. Patients' age group 40 to 70 years irrespective of sex, religion and socioeconomic status were taken.
3. Patients fit for *Basti* and willing to sign the informed consent were only included in the study.

Exclusion Criteria

1. Patients with secondary Knee OA.
2. Pregnant and lactating women.
3. Patients having other systemic disorders which may interfere with the course of the disease and its management.
4. Patients who are incapacitated, bed ridden and confined to wheel chair.

Assessment Criteria

Subjective Parameters

1. *Sandhi Shoola*
2. *Sandhi Sparshaasahyata*
3. *Prasarana Akunchanajanya Vedana*

Objective Parameters

1. Range of movement of knee joint (By Goniometry).
2. Serum Calcium
3. Crepitus
4. WOMAC osteoarthritis index.

Investigations

1. Serum calcium
2. X-ray knee AP and Lateral view

Criteria for assessment of results

The Assessment of result was made based on data collected as per subjective and objective parameters in all subjects before and after the completion of treatment and on follow up. To assess the effect of therapy objectively, all the signs and symptoms were scored depending upon their severity before and after treatment. Separate grading was given for the assessment of parameters.

Statistical analysis

The information gathered on the basis of observation made about various parameters was subjected to statistical analysis in terms of Mean, Standard Deviation and Standard error (SE).

Paired t test and Unpaired t test was carried out. The obtained results were interpreted as:

- Insignificant = $P > 0.05$

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- Significant =P < 0.05
- Highly Significant = P<0.01 and P<0.001.

Study Design: A Randomized Comparative Clinical Study

Sample size and grouping

40 Subjects fulfilling the inclusion criteria were randomly divided into two groups as Group A and Group B consisting 20 patients each.

Intervention

Table 1: Showing Treatment Protocol.

Procedure	Group A	Group B
Poorva Karma	➢ *Koshta Shodhana* with *Gandharvahastadi Eranda Taila* on the previous day of *Yoga Basti*. (Dose: according to the *Koshta* of subject) ➢ *Sarvanga Abhyanga* with *Murchita Tila Taila* f/b *Bhashpa Sweda* prior to administration of *Basti* on the day of *Basti Karma.*	➢ *Koshta Shodhana* with *Gandharvahastadi Eranda Taila* on previous day of onset of *Basti* course. (Dose: according to the *Koshta* of subject) ➢ *Sarvanga Abhyanga* with *Murchita Tila Taila* f/b *Bhashpa Sweda* prior to administration of *Basti* on the day of *Basti Karma.*
Pradhana Karma	➢ *Panchaprasrutika Basti* f/b *Anuvasana Basti* (*Yoga Basti* pattern), Dose 500ml ➢ *Anuvasana Basti* - Dose - 60ml (*Murchita Ghrita* 30ml + *Murchita Tila Taila* 30ml)	➢ *Panchaprasrutika Basti* without *Anuvasana* for 8 days, Dose 500ml
Paschat Karma	➢ After *Niruha Basti Pratyagamana, Ushna Jala Snana* f/b *Laghu Ahara Sevana*. *After Anuvasana Sphik Tadana, Mardana* of soles and palms.	➢ After *Basti Pratyagamana, Ushna Jala Snana* f/b *Laghu Ahara Sevana.*

***Niruha Basti* Dosage**

Table 2: Showing the dosage of *Niruha Basti* Ingredients.

Madhu	1 *Prasruta* (100ml)
Saindhava Lavana	6gms
Taila	*Murchita Tila Taila* 1 *Prasruta* (100ml)
Ghrita	*Murchita Ghrita* 1 *Prasruta* (100ml)
Ksheera	*Godugdha* 2 *Prasruta* (200ml)
Total Dose	*Panchaprasruta* (500ml)

***Anuvasana Basti* Dosage:** *Murchita Tila Taila* 30ml + *Murchita Ghrita* 30ml = 60ml.

Basti Pattern

Table 3: Showing the Basti Pattern of Group A.

Days	1	2	3	4	5	6	7	8
Basti	A	N	A	N	A	N	A	A

Table 4: Showing the Basti Pattern of Group B.

Days	1	2	3	4	5	6	7	8
Basti	N	N	N	N	N	N	N	N

Total duration of the intervention: 25 days

Duration of the treatment: 9 days [*Koshta Shodhana* for 1 day + *Basti Karma* for 8 days] and *Parihara Kala* for next 16 days.

Follow up on: 25th day

Total number of subjects registered for the study - 43

Total number of subjects completed the study - 40

3 drop outs from the study.

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RESULT

Group A

- Statistically Significant improvement was observed at the level of p value <0.05 in Subjective parameters *Sandhishoola, Sparshaasahyata, Prasarana Akunchanajanasya Vedana.*
- Statistically significant results were observed at the level of p value <0.05 in Objective parameters of ROM, Serum calcium, Pain, Stiffness, Difficulty in daily performing activities.

Group B

- Statistically Significant results were observed at the level of p value <0.05 in Subjective parameters *Sandhishoola, Sparshaasahyata, Prasarana Akunchanajanasya Vedana.*
- Statistically significant results were observed at the level of p value <0.05 in Objective parameters ROM, Serum calcium, Pain, Stiffness, Difficulty in daily performing activities.

Assessment of total effect of therapy

Table 5: Comparative effect of treatment between the group A & B (subjective parameters)

Parameter	Assessment	Group	Mean	S.D	S.E	PSE	t	p	Remarks
Sandhishoola	AT	A	2.225	0.802	0.17	0.25	1.001	>0.005	NS
		B	2.45	0.604	0.13				
	AF	A	1.225	0.549	0.12	0.21	0.7418	>0.05	NS
		B	1.35	0.515	0.11				
Sparsha Asahyata	AT	A	0.05	0.153	0.03	0.08	1.2328	>0.05	NS
		B	0.15	0.328	0.07				
	AF	A	0.025	0.111	0.02	0.01	0.5877	>0.05	NS
		B	0.05	0.153	0.03				
Prasarana Akunchanajanyasa Vedana Pravrutti	AT	A	1.025	0.549	0.12	0.11	0.8149	>0.05	NS
		B	1.175	0.612	0.13				
	AF	A	0.5	0.39s7	0.09	0.05	0.4175	>0.05	NS
		B	0.55	0.359	0.08				

Table 6: Comparative effect of treatment between the group A & B (objective parameter)

Parameter	Assessment	Group	Mean	S.D	S.E	PSE	t	p	Remarks
ROM	AT	A	1.475	0.549	0.12	0.10	0.7849	>0.05	NS
		B	1.325	0.654	0.14				
	AF	A	0.8	0.299	0.06	0.08	0.7118	>0.05	NS
		B	0.9	0.552	0.12				
Crepitus	AT	A	0.9	0.552	0.12	0.07	0.3187	>0.05	NS
		B	0.85	0.432	0.09				
	AF	A	0.55	0.455	0.10	0.06	1.2724	>0.05	NS
		B	0.725	0.412	0.09				

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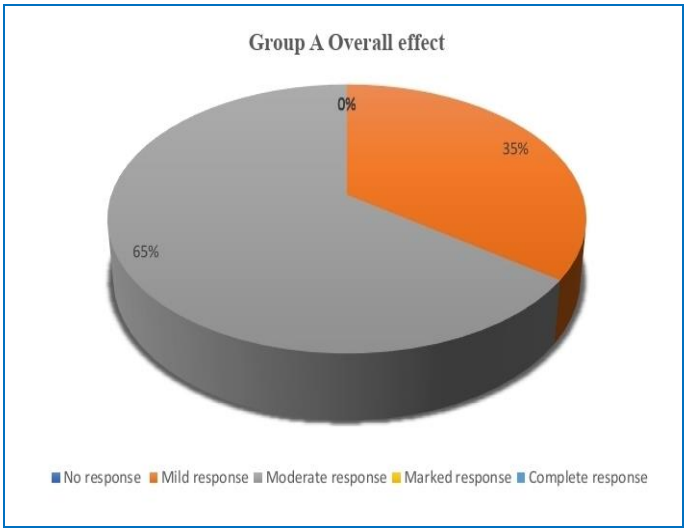
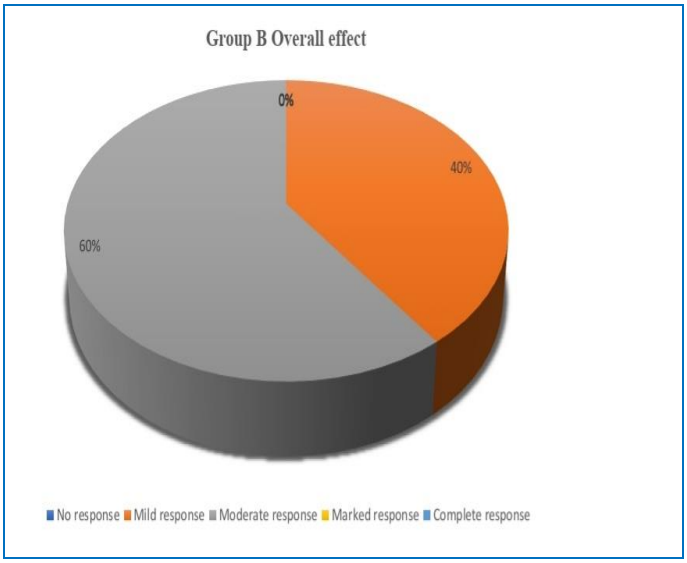
Serum Calcium	AF	A	8.825	0.454	0.10	0.03	0.3240	>0.05	NS
		B	8.872	0.453	0.10				
Pain	AF	A	7.15	4.475	1	0.6	0.0402	>0.05	NS
		B	7.1	3.291	0.73				
Stiffness	AF	A	2.2	1.576	0.35	0.29	2.4388	<0.05	S
		B	3.4	1.535	0.34				
DIDPA	AF	A	22.95	11.33	2.53	2.13	0.5534	>0.05	NS
		B	24.9	10.93	2.44				

Table 7: Comparative results of Group A and Group B

SN	Class	Gradings	Group A	Group B
1.	0	No response	0	0
2.	1-33%	Mild response	7	8
3.	34-66%	Moderate response	13	12
4.	67-99%	Marked response	0	0
5.	100%	Complete response	0	0

Graph 1: Showing Overall response in Group A and Group B.





Comparative analysis of the overall effect of the treatments in both the groups was done on statistically with unpaired t test. The test shows that the treatment was significant in Group A when compared to Group B. Group A overall result was 65% and Group B overall result was 60%.

DISCUSSION

Probable mode of action of the drug

Madhu and *Saindhav* added in the *Basti Dravya* make the solution hypertonic. It is possible that *Dosha's* along with toxins enter the gut by the phenomenon of osmosis and are finally taken out with *Basti Dravya* through anal canal. The presence of Na+ in *Basti* may play important role for the absorption the drug as Na+ channels are most commonly used channels for absorption. The cells of the intestinal mucous membrane are easily permeable by sodium chloride that solutions are absorbed almost rapid. The concentrated dose of salt causes irritant action on the bowel producing peristalsis.

Saindhava nothing but NaCl elicits an action potential because there will be increase in the concentration of sodium ions outside the cell, thus increasing the cell's equilibrium potential of sodium ions and creating a concentration gradient. Due to the buildup of these ions, the cell's membrane is depolarized and membrane proteins called voltage-gated sodium channels are activated which allow rapid influx of sodium ions into the cell.

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This causes the local potential of the cell to rise. This change in potential activates nearby sodium-potassium channels to repeat the process, thus generating an action potential. It dissolves and expels *Dosha* from colon. Thus, it helps in absorption and biopurification process of Basti.

Ghrita contains omega 3 and omega 9 essential fatty acids. The total fat content of ghee consists of approximately 65 percent saturated fats, consists of easily digested short-chain fatty acids for approximately 89 percent with an additional 3 percent from conjugated linoleic acid, a source of antioxidants (Immunomodulatory) that protect the body against free radicals. It also contains Vitamins, in which Vitamin A, D, E & K are antioxidants which play an important role to utilize calcium and phosphorous from blood and are helpful in reducing ketone bodies, helpful in preventing oxidative injury to growth of human body. Since active ingredients are mixed with *Ghrita*, they are easily digested and absorbed. Lipophilic nature of Ghee facilitates entry of the formulation into the cell, and its delivery to the nuclear membrane.

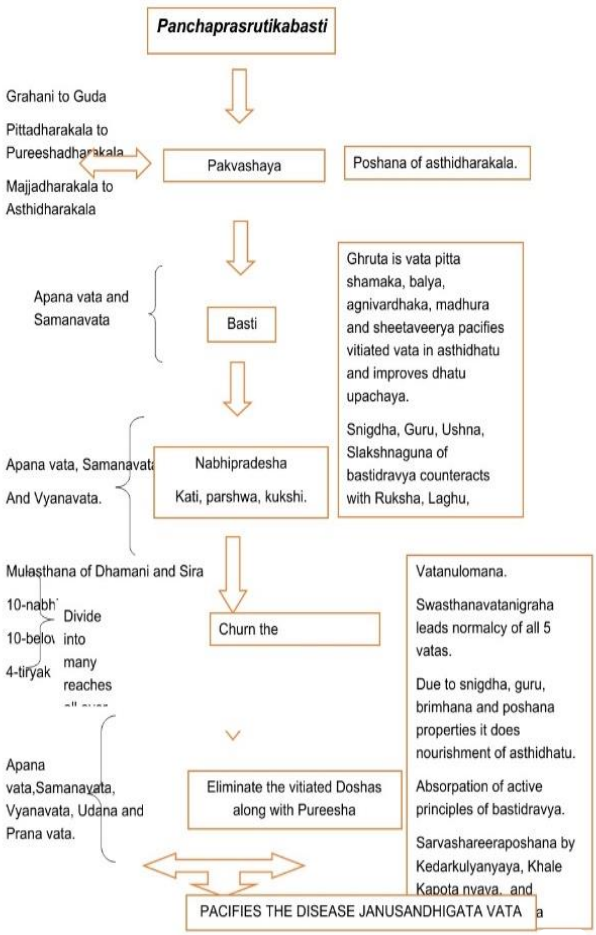
Ghrita having *Madhura Rasa, Snigdha, Guru Guna, Madhura Vipaka*[6] which leads to the pacification of *Vata Roga.* Being *Yogavahi* in nature, it increases the potentiality of the drug by increasing their activity and utility on a particular disease, does *Upchaya* of *Rasa* to *Shukra* hence helps in *Dhatu Poshana*, Due to its *Nirvapana* property it acts as anti-inflammatory and *Daha Shamaka*. Because of its *Guru, Snigdha* and *Sheeta* properties it increases the amount of *Prakrut Shleshaka Kapha* which is *Ruksha* in this condition hence does the *Purana* of the *Janusandhi*.

Murchita Tila Taila contains Mono unsaturated Fatty acids (MUFA) (45%) and Poly unsaturated Fatty acids PUFA (40%) having 1% linolenic acid, omega-3 and lecithin (fat emulsifying agent). Used to relieve aches, pain, wound healing. Linolenic acid is essential for normal growth and development. In the body, linolenic acid is used to make substances called eicosanoids, which regulate inflammation. Lecithin has emulsification and lubricant properties, and is a surfactant. It can be totally metabolized by humans, so is well tolerated by humans and non-toxic when administered. Sesame seeds are loaded with copper, magnesium, calcium, healthy omega-3 fats and have high protein content, which can be beneficial for people suffering from OA.

Milk is a good source of protein, fat, calcium and several other nutrients. Beside calcium, other mineral present in milk is Sulphur, magnesium, manganese, iodine, zinc etc.

Calcium in milk is more readily absorbed than that in other foods, probably because of its combination with amino acids. Milk is a most valuable food for the formation of bone. The major protein in milk is casein, which is present as calcium caseinate. Other proteins present in milk are lactoglobulin, lactalbumin and lactoferritin which are highly nutritious and provide immunological benefits.

Flow chart. NO.2: Showing Probable Mode of Action of Basti Karma:



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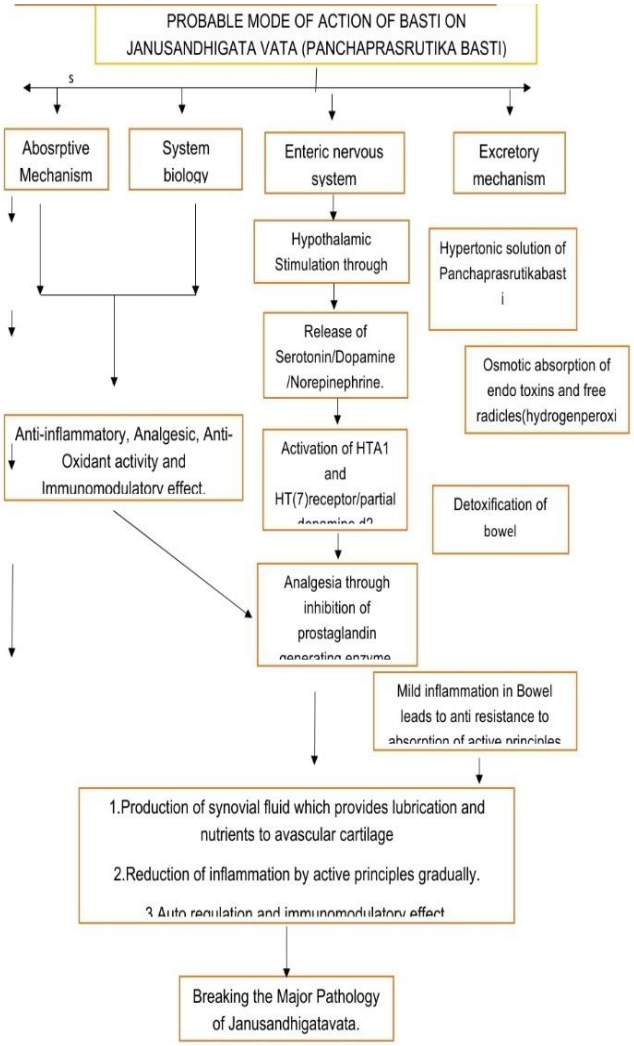

CONCLUSION

Janusandhigatavata is one of the most common *Shoolapradhana Vataja Nanatmaja Vyadhi* manifesting mainly in *Vardhakyaavastha* due to *Dhatukashya* and other *Vataprakpoka Nidana*. It can be co-related with OA of Knee joint. *Sandhigata Vyadhi* is *Chirakari* & *Madhyama Rogamargajanya* involving *Marmasthisandhi* so for *Chikitsa* it is *Yapya* and *Kashtasadhya.* Majority number of female subjects belonged to Age Group 51- 60yrs and were attained menopause. *Panchaprasrutika Ksheera Basti* is a *Mridu Basti*, with the benefits of *Yapana Basti*. It improves *Bala-Varna*, safe in old aged & *Sukumara Purusha* and is mainly *Brimhanakar* and *Vatahara* as observed in this study. Overall response: In Group A - Out of 20 subjects 7 subjects & in Group B - 8 subjects showed Mild improvement. In Group A 13 patients & in Group B 12 subjects showed moderate improvement. Majority of *Vatakapha* and *Vatapitta Prakruti* individuals seen in the study may be because of the close proximity of *Doshas* with the disease entity. Addition of *Saindhava Lavana* [not mentioned in classics] helps to attain a homogenous mixture of *Basti Dravya* in short duration of time and aids for better absorption. Due to the thicker consistency of *Basti Dravya* average time taken for administration of *Ashtapana Basti* was 8 minutes, bit more than usual. 37.5 % had retention for more than 10 mins may be due to *Mridu* nature of *Basti* ingredients. Within the groups all parameters except Crepitus and *Sparsha Asahyata* showed highly significant result. Comparative effect of treatment on all the Parameters in Group A and Group B showed non-significant results. So, it can be concluded that both the groups are effective in *Janusandhigata vata*. However clinically efficacy of Group A showed better results than Group B. Clinically Group A was more effective in improvement of *Sandhi Shoola, Prasarana Akunchanajanya Vedana*, ROM, Stiffness of joint. Whereas Group B was comparatively less effective in these symptoms but showed encouraging results in serum calcium after follow up. Satiety of subjects was found clinically more in Group A which may be due to added effect of *Anuvasana.* No complications were observed in Group B which was administered without *Anuvasana;* So, it also can be considered in treating *Janusandhigata Vata.* Management of OA is very difficult at later stages of the disease i.e., 4th stage with deformity. *Panchaprasrutika Basti* with *Anuvasana* can be considered in 1st, 2nd, 3rd stages of OA for slowing down the progressive degeneration and pathogenesis of the disease. So, it can be concluded that *Sandhigata Vata* can be well managed by *Ksheera Basti* as results show in present study. Effect of *Panchtikta Ksheera Basti* for OA is confirmed due to its systemic effect on *Dhatukshaya* (degenerative changes in joint) and vitiated *Vata* which proved their significance in individual physical function as well as overall effect shown with the help of WOMAC index. Thus, *Panchaprasrutika Ksheera Basti* expels out morbid *Doshas* and nourishes the body, as a result helps in regeneration of *Asthi* and *Majja Dhatu.*

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