

## An Open Label Double Arm Randomized Study to Compare the Effect of *Janu Pichu*, *Navaprasrutika Basti* and *Janu Veshtana*, *Navaprasrutika Basti* in *Janusandhigata Vata* Vis-À-Vis Osteoarthritis of Knee Joint

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### ABSTRACT

**Background:** *Janusandhigata Vata* stands at the top of the list among Vata Vyadhi in all the Samhitas, characterized by Shoola, Shotha, Stambha, Atopa, and *Prasarana Akunchana Vedana* in *Janusandhi*. Acharyas have explained *Snehana*, *Bandhana*, and *Basti Karma* as one of the treatment modalities for disease pertaining to *Snayu*, *Asthi*, and *Sandhi*, which were adopted in the present study.

**Methodology:** In the present study, 40 subjects diagnosed as *Janusandhigata Vata* vis-à-vis osteoarthritis of the knee joint were randomly assigned into two groups, Group A and Group B, comprising 20 subjects each. Subjects belonging to Group A were subjected to *Janu Pichu* with *Moorchita Taila* for the duration of 30 minutes, *Navaprasrutika Basti* in the form of *Yoga Basti* pattern was administered for 8 consecutive days, whereas the subjects pertaining to Group B were subjected to *Navaprasrutika Basti* in the form of *Yoga Basti* pattern and *Janu Veshtana* with *Moorchita Taila* for the duration of 6 hours a day, for 8 consecutive days.

**Results:** In both Group A and Group B, the Wilcoxon Signed Rank Test applied within the group analysis for the subjective parameters has shown statistically highly significant results ( $P < 0.001$ ). The Mann-Whitney 'U' Test applied between the group analysis for the subjective parameters has shown no significant difference between the two groups.

**Conclusion:** The present study validates that both *Janu Pichu* with *Moorchita Taila*, *Navaprasrutika Basti*, and *Janu Veshtana* with *Moorchita Taila*, *Navaprasrutika Basti* are significantly effective in the management of *Janusandhigata Vata* vis-à-vis osteoarthritis of the knee joint.

**Study Registration:** CTRI/ 2021/02/030890

**Keywords:** *Janusandhigata Vata*, Osteoarthritis of Knee joint, *Janu Pichu*, *Janu Veshtana*, *Navaprasrutika Basti*, *Moorchita Taila*.

### INTRODUCTION

The present study entitled “An open label double arm randomized study to compare the effect of *Janu Pichu*, *Navaprasrutika Basti* and *Janu Veshtana*, *Navaprasrutika Basti* in *Janusandhigata Vata* vis-à-vis osteoarthritis of knee joint.” As the age progresses, all Dhatu undergoes *Kshaya*, thus leading to *Vata Prakopa*, which gets localized in *Janu Sandhi*, leading to the manifestation of *Janusandhigata Vata* presenting with *Janusandhi Shoola*, *Janusandhi Shotha*, *Janusandhi Stambha*, *Janusandhi Atopa* and *Janusandhi Prasarana Akunchana Vedana*.<sup>1</sup> Due to the similarities in the clinical features, *Janusandhigata Vata* can be correlated to osteoarthritis of the knee joint. Due to progressive degenerative changes in the articular cartilage over the years, particularly in weight-bearing joints, osteoarthritis comes under crippling disorders which affect the musculoskeletal system *Basti Karma* is a supreme treatment for *Vata Vyadhi*<sup>2</sup> and also known as *Ardha Chikitsa* because of its multifaceted actions among which *Navaprasrutika Basti* explained in *Prasruta Yogyam Siddhi Adhyaya* of *Charaka Samhita* is told for the condition.<sup>3</sup> *Sushruta* describes *Snehana* and *Bandhana* as one of the treatment modalities<sup>4</sup> for diseases pertaining to *Snayu*, *Asthi*, and *Sandhi*, which can be adopted by *Janu Pichu* and *Janu Veshtana* as one among *Bahir Parimarjana Chikitsa*. *Janu Pichu* is a cotton pad soaked in *Moorchita Taila*, which is placed over the affected knee joint for 30 minutes, whereas *Janu Veshtana* is a cora cloth dipped in *Moorchita Taila*, tied over the affected knee joint in a circular manner, and retained for 6 hours. *Janu Pichu* imparts *Snehana Karma* whereas *Janu Veshtana* imparts *Snehana Karma* and added effect of *Bandhana Karma* for the betterment of the condition.

## MATERIALS AND METHODS

40 subjects presenting with the *Lakshanas* of *Janusandhigata Vata* vis-à-vis Osteoarthritis of Knee Joint, coming under the inclusion criteria, were screened and randomly selected from the OPD and IPD of Sri Kalabyraveswaramswamy Ayurvedic Medical College, Hospital and Research Centre, Bengaluru for the study. The sample collection was initiated with post approval from the Institutional Ethics Committee with number SKAMCH & RC/IEC/038/2020 dated 27th March 2020 and Post registration in CTRI (CTRI/ 2021/02/030890).

The identified raw drugs required for the study were purchased from approved vendors, and post-purchase of the raw drugs were authenticated by the faculty of the Department of *Dravyaguna* of Sri Kalabyraveswaramswamy Ayurvedic Medical College, Hospital and Research Centre. The Brihata Panchamoola Kwatha Choorna was prepared in the pharmacy of Department of Rasa Shastra and Bhaishajya Kalpana of Sri Kalabyraveswaramswamy Ayurvedic Medical College, Hospital and Research Centre.

The subjects who fulfilled the inclusion criteria complying with the informed consent were selected using random sampling techniques.

This was a comparative study, wherein 40 subjects of either gender diagnosed as *Janusandhigata Vata* vis-a-vis Osteoarthritis of the Knee Joint were assigned through a random sampling method.

### Inclusion criteria:

- Subjects of either gender between the age group of 40-70 years.
- Subjects presenting with *Lakshanas* of *Janusandhigata Vata*.
- Subjects presenting with signs and symptoms of Osteoarthritis of Knee Joint.
- Subjects presenting with the radiological evidence of Osteoarthritis of Knee Joint.
- Subjects fit for *Basti Karma*.
- Subjects fit for *Snehana Karma*.

### Exclusion criteria:

- Subjects having any other systemic disorders, which may interfere with the course of treatment.
- Pregnant and lactating women.

### Intervention:

40 subjects of *Janusandhigata Vata* vis-à-vis Osteoarthritis of Knee Joint who fulfilled the inclusion criteria were selected and randomly assigned into 2 groups, Group A and Group B, comprising 20 subjects in each.

- **Group A:** The subjects in Group A were subjected to *Janu Pichu* with *Moorchita Taila* for the duration of 30 minutes; thereafter, *Navaprasrutika Basti* in the form of *Yoga Basti* pattern was administered for 8 consecutive days.
- **Group B:** The subjects in Group B were subjected to *Navaprasrutika Basti* in the form of *Yoga Basti* pattern and *Janu Veshtana* with *Moorchita Taila* for the duration of 6 hours a day, for 8 consecutive days.

### The procedure of *Janu Pichu* in Group A:

#### *Poorva Karma:*

#### Preparation of Medicine

- *Moorchita Taila* was taken in a vessel in a required quantity and was heated indirectly over hot water bath.

#### Preparation of Subject

- The subject selected for *Janu Pichu* was made to lie in a supine position on Droni with exposed affected knee joints, and Mridu Abhyanga with *Moorchita Taila* was done.

#### *Pradhana Karma*

- The *Pichu* of the desired measurement was dipped completely in the lukewarm *Moorchita Taila* slowly with gentleness and placed around the *Janu Sandhi* by considering the subject's tolerability towards the temperature of the medicine. *Pichu* was retained until the temperature of the *Taila* was reduced.
- Another *Pichu* of the same size was used every 5 minutes to replace the heated *Taila* for the maintenance of constant temperature. Another *Pichu* was kept while medicine from the initial *Pichu* was drained and heated again to maintain the continuity of treatment.
- After 30 minutes, the *Pichu* was removed, and *Taila* was squeezed out.

#### *Pashchat Karma*

- After removing the *Pichu*, Mridu Abhyanga was done over the *Janu Sandhi* for 5 minutes, and the subject was advised to take rest for 5 minutes. The treated area was washed with lukewarm water.

### Procedure of *Janu Veshtana* in Group B:

#### *Poorva Karma:*

#### Preparation of Medicine

- *Moorchita Taila* was taken in a vessel in a required quantity and was heated indirectly over a hot water bath.

#### Preparation of Subject

- The subject selected for Janu Veshtana was made to lie in a supine position on *Droni* with exposed affected knee joints, and *Mridu Abhyanga* with *Moorchita Taila* was done.

#### Pradhana Karma

- The *Veshtana* cloth roll of the desired measurement was dipped completely in the lukewarm *Moorchita Taila* gently until it was fully soaked, followed by gently squeezing to take out excess *Taila*. The cloth roll soaked in warm *Moorchita Taila* was wrapped not too tightly nor too loosely around the knee joint in a circular manner. The free ends of the cloth were fastened in position using two cloth threads of sufficient length. After 6 hours, the *Veshtana* was removed.

#### Pashchat Karma

- After the removal of the *Veshtana*, the subject was advised to wash the treated part with lukewarm water.

Table No. 1: Showing the Medicines required for Navaprasrutika Niruha Basti		
Medicine	Quantity	Quantity
<i>Madhu</i>	1 <i>Prasruta</i>	96ml
<i>Saindhava Lavana</i>	1/4 <sup>th</sup> less than 1 <i>Karsha</i>	9gms
<i>Moorchita Taila</i>	2 <i>Prasruta</i>	192ml
<i>Moorchita Ghrita</i>	1 <i>Prasruta</i>	96ml
<i>Brihat Panchamoola Kashaya</i>	5 <i>Prasruta</i>	480ml

#### Method of preparation of Navaprasrutika Basti:

As per Table No. 1, 120 g of *Brihat Panchamoola Kwatha Choorna* was added to 1920 ml of water and further heated on a low flame to reduce it to 1/4<sup>th</sup>, which was 480 ml. *Navaprasrutika Basti* was prepared as per the classical method told in the *Samhitas* by adding the first 96ml of honey in a *Manthana Yantra*. 9gm of *Saindhava Lavana* was added to the honey and mixed well with *Manthana* till a homogenous mixture was achieved. The indirectly heated *Moorchita Taila* in a water bath in the quantity of 192 ml was added slowly in a uniform manner, along with mixing using methane, till homogeneity was achieved. *Moorchita Ghrita*, which was heated in a water bath, was taken in a quantity of 96 mL and further added slowly in a uniform manner along with mixing using *Manthana* till homogeneity was achieved. At last, 480ml of *Brihat Panchamoola Kwatha* was added slowly in a uniform manner, along with mixing using *Manthana* till homogeneity was achieved.

Table No. 2: Showing the Yoga Basti Pattern for Navaprasrutika Niruha Basti							
A	N	A	N	A	N	A	A
Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8

#### Assessment Criteria:

Assessment of the clinical study was done based on the grading of subjective parameters viz *Janusandhi Shoola*, *Janusandhi Shotha*, *Janusandhi Stambha*, *Janusandhi Prasarana Akunchana Vedana*, *Janusandhi Atopa*, and *Womac Score*

#### Statistical analysis

- For the Statistical analysis, the data obtained in the group were recorded and presented in tabulations and drawings.
- To infer the clinical study and draw a conclusion

The subjective parameters like *Janusandhi Shoola*, *Janusandhi Shotha*, *Janusandhi Stambha*, *Janusandhi Prasarana Akunchana Vedana*, *Janusandhi Atopa*, and *Womac Score* were subjected to the Wilcoxon Signed Rank test for within-group analysis and the Mann-Whitney U test for between-group analysis.

- The corresponding p-value was noted, and the obtained results were interpreted as per Table No. 4.

Table No. 4: Showing Interpretation of p Value	
Interpretation	p Value
Non significant	> 0.05
Significant	< 0.05
Highly Significant	< 0.01, < 0.001

Assessment was taken at

- **BT**- Before treatment – Day 1
- **AT** – After Treatment – Day 8

## RESULTS

The assessment was done before treatment (BT) and after treatment (AT), and the assessment parameters like *Janusandhi Shoola*, *Janusandhi Shotha*, *Janusandhi Stambha*, *Janusandhi Atopa*, *Janusandhi Prasarana Akunchana Vedana*, and Womac Score were subjected to the Wilcoxon Signed-Ranked Test to compare the Mean Rank within the groups and Mann Mann-Whitney ‘U’ test to compare the Mean Rank difference between the two groups, respectively.

### Effect of therapies on subjective criteria

In Group A, the Wilcoxon Signed Rank Test on *Janusandhi Shoola* revealed statistically highly significant result with  $Z = -4.053$ ,  $p < 0.001$  and in Group B, the Wilcoxon Signed Rank Test on *Janusandhi Shoola* revealed statistically highly significant result with  $Z = -4.099$ ,  $p < 0.001$  whereas after treatment, the Mann Whitney ‘U’ test revealed statistically no significant difference between the Group A and Group B. Based on Mean rank, the after treatment effect in Group A on *Janusandhi Shoola* is comparatively little better than Group B as the mean rank of Group A is lower than that of Group B.

In Group A, the Wilcoxon Signed Rank Test on *Janusandhi Shotha* revealed statistically highly significant result with  $Z = -3.879$ ,  $p < 0.001$  and in Group B, the Wilcoxon Signed Rank Test on *Janusandhi Shotha* revealed statistically highly significant result with  $Z = -4.264$ ,  $p < 0.001$  whereas after treatment, the Mann Whitney ‘U’ test revealed statistically no significant difference between the Group A and Group B. Based on Mean rank, the after treatment effect in Group B on *Janusandhi Shotha* is comparatively little better than Group A as the mean rank of Group B is lower than that of Group A.

In Group A, the Wilcoxon Signed Rank Test on *Janusandhi Stambha* revealed statistically highly significant result with  $Z = -3.606$ ,  $p < 0.001$  and in Group B, the Wilcoxon Signed Rank Test on *Janusandhi Stambha* revealed statistically highly significant result with  $Z = -3.606$ ,  $p < 0.001$  whereas Mann Whitney ‘U’ test was not adopted to compare the effect of treatment on *Janusandhi Stambha* in between the Group A and Group B as the mean rank and sum of the ranks in both Group A and Group B remains same as 20.5 and 410 respectively. Henceforth, there is no significant difference in after treatment between Group A and Group B.

In Group A, the Wilcoxon Signed Rank Test on *Janusandhi Atopa* revealed statistically highly significant result with  $Z = -3.317$ ,  $p < 0.001$  and In Group B, the Wilcoxon Signed Rank Test on *Janusandhi Atopa* revealed statistically highly significant result with  $Z = -3.464$ ,  $p < 0.001$  whereas After treatment, the Mann Whitney ‘U’ test revealed statistically no significant difference between the Group A and Group B. Based on Mean rank, the after treatment effect in Group B on *Janusandhi Atopa* is comparatively little better than Group A as the mean rank of Group B is lower than that of Group A.

In Group A, the Wilcoxon Signed Rank Test on *Janusandhi Prasarana Akunchana Vedana* revealed statistically highly significant result with  $Z = -4.179$ ,  $p < 0.001$  and In Group B, the Wilcoxon Signed Rank Test on *Janusandhi Prasarana Akunchana Vedana* revealed statistically highly significant result with  $Z = -4.185$ ,  $p < 0.001$  whereas Mann Whitney ‘U’ test was not adopted to compare the effect of treatment on *Janusandhi Prasarana Akunchana Vedana* in between the Group A and Group B as the mean rank and sum of the ranks in both Group A and Group B remains same as 20.5 and 410 respectively. Henceforth, there is no significant difference in after treatment between Group A and Group B.

In Group A, the Wilcoxon Signed Rank Test on Womac Score revealed statistically highly significant result with  $Z = -3.925$ ,  $p < 0.001$  and in Group B, the Wilcoxon Signed Rank Test on Womac Score revealed statistically highly significant result with  $Z = -3.922$ ,  $p < 0.001$  whereas After treatment, the Mann Whitney ‘U’ test revealed statistically no significant difference between the Group A and Group B. Based on Mean rank, the after treatment effect in Group A on Womac Score is comparatively better than Group B as the mean rank of Group A is lower than that of Group A.

**Table No. 5: Showing the Effect of therapies on subjective criteria within the groups**

Assesment Criteria	Group	Parameter	Ranks		Mean rank	Sum of rank	Z value	P value	Remarks
<i>Janusandhi Shoola</i>	A	<b>BT-AT</b>	NR	0	10.50	210	- 4.053	< 0.001	HS
			PR	20					
			Ties	0					
	B	<b>BT-AT</b>	NR	0	10.5	210	- 4.099	< 0.001	HS
			PR	20					
			Ties	0					
	A	<b>BT-AT</b>	NR	0	9	153	- 3.879	< 0.001	HS

<i>Janusandhi Shotha</i>			PR	17					
			Ties	3					
	<b>B</b>	<b>BT-AT</b>	NR	0	10	190	- 4.264	< 0.001	HS
			PR	19					
			Ties	1					
<i>Janusandhi Stambha</i>	<b>A</b>	<b>BT-AT</b>	NR	0	7	91	- 3.606	< 0.001	HS
			PR	13					
			Ties	7					
	<b>B</b>	<b>BT-AT</b>	NR	0	7	91	- 3.606	< 0.001	HS
			PR	13					
			Ties	7					
<i>Janusandhi Atopa</i>	<b>A</b>	<b>BT-AT</b>	NR	0	6	66	-3.317	< 0.001	HS
			PR	11					
			Ties	9					
	<b>B</b>	<b>BT-AT</b>	NR	0	6.5	78	- 3.464	< 0.001	HS
			PR	12					
			Ties	8					
<i>Janusandhi Prasarana Akunchana Vedana</i>	<b>A</b>	<b>BT-AT</b>	NR	0	10.50	210	- 4.179	< 0.001	HS
			R	20					
			Ties	0					
	<b>B</b>	<b>BT-AT</b>	NR	0	10	190	- 4.185	< 0.001	HS
			PR	19					
			Ties	1					
<b>Womac Score</b>	<b>A</b>	<b>BT-AT</b>	NR	0	10.50	210	- 3.925	< 0.001	HS
			PR	20					
			Ties	0					
	<b>B</b>	<b>BT-AT</b>	NR	0	10.50	210	- 3.922	< 0.001	HS
			PR	19					
			Ties	1					

Table No. 6: Showing the effect of therapies on subjective criteria between the groups									
Assesment Criteria	Phase	Group A		Group B		'U' Value	Z Value	P Value	Result
		MR	SR	MR	SR				
<i>Janusandhi Shoola</i>	<b>BT</b>	21	420	20	400	190	-0.316	> 0.05	<b>NS</b>
	<b>AT</b>	20	400	21	420	190	-0.593	> 0.05	<b>NS</b>
<i>Janusandhi Shotha</i>	<b>BT</b>	22	440	19	380	170	-0.892	> 0.05	<b>NS</b>
	<b>AT</b>	22	440	19	380	170	- 0.947	> 0.05	<b>NS</b>
<i>Janusandhi Stambha</i>	<b>BT</b>	20.5	410	20.5	410	200	-	-	<b>NS</b>
	<b>AT</b>	20.50	410	20.50	410	200	-	-	<b>NS</b>
<i>Janusandhi Atopa</i>	<b>BT</b>	23.35	467	17.65	353	143	-1.789	> 0.05	<b>NS</b>
	<b>AT</b>	21.16	402	18.90	378	168	-0.782	> 0.05	<b>NS</b>
<i>Janusandhi Prasarana Akunchana Vedana</i>	<b>BT</b>	21.9	438	19.1	382	172	-1.148	> 0.05	<b>NS</b>
	<b>AT</b>	20.5	410	20.5	410	200	-	-	<b>NS</b>
<b>Womac Score</b>	<b>BT</b>	18.98	379.5	22.02	440.5	169	-0.826	> 0.05	<b>NS</b>
	<b>AT</b>	17.6	352	23.4	468	142	-1.581	> 0.05	<b>NS</b>

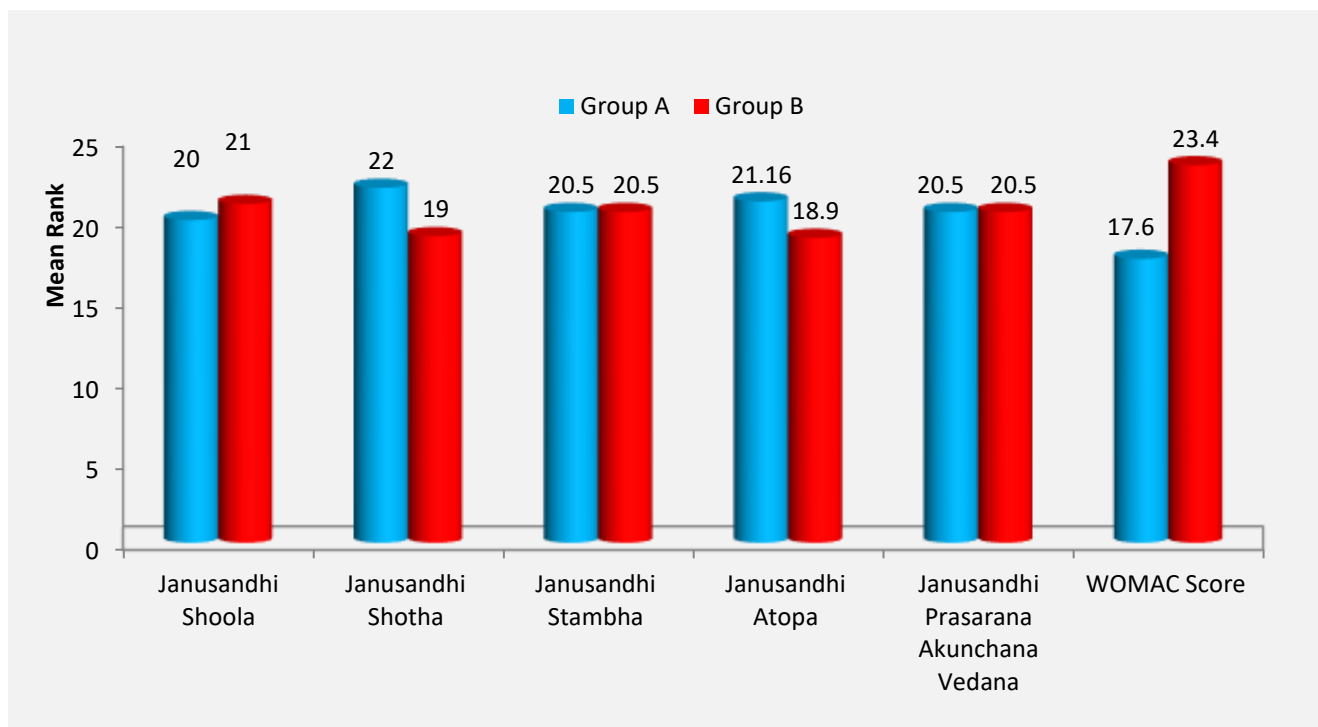


Fig. No. 1: Showing the effect of therapies on subjective criteria between the groups

## DISCUSSION

*Basti Karma*, being one among the panchakarma, is an efficient palliative treatment of vitiated *Doshas* in the body. According to *Sushruta*, with the help of *Basti*, one can treat *Vataja*, *Pitaja*, *Kaphaja*, and *Raktaja* disorders either alone or when they produce diseases in combination.<sup>5</sup> Further, *Sushruta* mentions the multidimensional therapeutic effect of *Basti Karma*, which can be achieved by using different medicines in combinations. *Basti Karma* is the procedure in which medicine prepared accordingly is administered through anal canal which reaches up to *Nabhi*, *Kati*, *Parshwa* and *Kukshi* further churning the accumulated *Doshas* and *Purisha*, spreads the potency of medicine to all over the body and easily comes out along with churned *Purisha* and *Dosha*.<sup>6</sup> *Acharyas* have explained various *Prasrita Yogika Basti* where the quantity of ingredients is fully and specifically mentioned and are to be used as such. One among the *Prasrita Yogika Basti* is *Navaprasrithika Basti*, which was selected as it has *Vatahara*, *Snehaneya* properties, and mentioned as *Basti Kalpana* for *Vataja Vyadhis*. The ingredients used for *Navaprasrutika Basti* have *Veedanasthapaka* property which helps in reducing symptoms.<sup>7</sup>

### Probable Mode of Action of *Basti Karma*

The properly administered *Basti* will reach *Nabhi*, *Kati*, *Parshwa*, and *Kukshi* regions, from where the *Veerya* of the *Basti* spreads to the whole body through the *Srotas*, just like water given to the roots spreads all over the tree. *Basti*, which is coming out either alone or mixed with *Mala*, produces its effect immediately with the help of *Apana Vata*. Due to its *Veerya* and *Gunas* of medicine like *Tikshna*, *Ushna*, and *Vyavayi*, it draws the *Dosha* present from head to foot just as the sun remains in the sky at a distance yet draws the moisture from the earth. *Vata* is the chief cause for the aggravation of the disease and other *Doshas*; therefore, there is no other treatment except *Basti Karma* to control it, just like the borders of the oceans can control the waves produced by the wind. All organs related to *Basti Karma* are *Sadhyo Pranahara Marmas*, by the virtue of *Agneya Guna*, which may help to transport the *Basti Veerya* more easily. The given *Basti* reaches *Nabhi Pradesh*, and the *Veerya* may get transported through *Dhamanis*, *Sira*, and *Srotas* to the whole body. The *Basti* is given to *Vata Sthana*, and so it can alleviate the *Vata* at its own site.

*Janu Pichu* is a procedure evolved from *Shiro Pichu* and is a kind of *Bahya Snehana*. Hence, by using support from *Sharira Santarpana Kala*, this states the time required by the *Sneha* to just enter into *Romakupa*, *Rasadi*, and the duration is of 800 *Matra Kalas* for *Sneha* to reach *Asthi Dhatu*, whereas *Acharya Vagbhata* states the duration of *Shiro Basti* for *Vataja Vyadhi* is 10,000 *Matra Kala*; thereby, the duration of the procedure is fixed to 30 minutes to evaluate the results. The intention was to provide maximum contact and retention period for *Taila* to the joint. It has the advantage of molding itself according to the different knee joints of different subjects, along with covering complete *Janu Sandhi*. *Janu Pichu* is a modality that is easy to use with minimal manpower required.

*Veshtana* is a procedure that involves bandaging the cloth around the joint. Here, the Cora cloth dipped in *Moorchita Taila* was tied around both knee joints in a circular manner and retained for 6 hours. There is no clear description on time duration pertaining to *Veshtana*, hence by using support from *Sharira Santarpana Kala*, *Matra Kalas* for *Sneha* to reach *Asthi Dhatu*, and while explaining *Upanaha*, he directs the duration of 12 hours, which is the *Upanaha* tied in night to be removed in day. Hence, by keeping all these in view, *Janu Veshtana* was adopted for 6 hours. *Janu Veshtana* imparts *Snehana Karma* with the help of *Moorchita Taila*, having a longer contact period and retention of *Taila* on the joint. Along with that, it also provided the effect of *Bandhana*, making the treatment a combination of *Snehana* and *Bandhana*. Narrowing of the space and formation of osteophytes in the joint leads to some sort of injury to the surrounding structures, which manifests the symptoms of *Janusandhigata Vata*, and when the joint is subjected to movement, the femur bone and the tibia bone undergo friction with each other. *Shleehaka Kapha*, which is responsible for the Firmness and easy movement of joints, its *Kshaya* leads to more injury to surrounding structures when the joint is subjected to movement. *Janu Veshtana*, by virtue of the *Bandhana*, restricts the joint movement to an extent that allows the injury of surrounding structures to recover fast, and the property of *Moorchita Taila* also helps in the pacification of vitiated *Vata Dosha*, along with providing *Sthirkara* to the Sandhi.

#### **Probable mechanism of Bahya Snehana:**

*Chakrapani*, while explaining the *Bahir Parimarjanaya Bhesaja Prayoga*, directs us to select the treatment modality based on the *Sharira Avyaya*, which is based on the affected part of the *Sharira*. Based on the *Sthana involvement of disease pathology*, *Pradehadi line of management has to be selected*. Hence, keeping this in view, *Janu Pichu* and *Janu Veshtana* have been selected. *Taila*, by virtue of its *Snigdha*, *Ushna*, and *Guru Guna*, counters *Ruksha*, *Sheeta*, and *Laghu Guna* of *Vata Dosha*, thereby alleviating the aggravated *Vata Dosha*.

Ageing elicits several structural changes in microvasculature. An impairment of endothelial properties represents a main aspect of age-related microvascular alterations. Endothelial dysfunction manifests itself through a reduced angiogenic capacity and impaired vasodilatory functions. Data from experimental models indicates that decreased nitric oxide bioavailability is one of the causes responsible for age-related microvascular endothelial dysfunction. Consequently, vasodilatory response declines with age in the coronary, skeletal, cerebral, and vascular beds. Vascular endothelial cells secrete a series of biologically vasoactive molecules that play important roles in maintaining vascular structural and functional stability. In addition to impaired endothelium-dependent vasodilatation, the balance between vasodilatation and vasoconstriction can be modulated by the synthesis and release of vasodilators like Nitric Oxide. Vascular ageing causes remodeling of the vascular structures, resulting in the dysfunction of vessels. These structural changes lead to impaired supply of nutrients to the tissue level, leading to degeneration of the same, which is why age-related degeneration is commonly seen.<sup>8</sup>

The *Srotas* in the *Sharira* get *Sankuchita* with the advancement of age. *Taila* is the only one that can enter persons with *Sankuchita Srotas*. *Taila*, with its *Tikshnadi Guna*, quickly reaches the *Sankuchita Srotas* and clears it, thereby removing the *Srotoavrodha*. Due to the clear *Srotas*, the body of the person becomes strong, and there is an increase in *Bala* and *Varna* as the *Aahara Rasa* starts flowing freely and gets absorbed by *Sharirasth Dhatu*, which makes *Dhatu Pustha*.

There are four *Dhamniyas* which spreads transversely and divide into hundreds and thousands of branches further and so become innumerable. Their openings are attached to the hair follicles, through these openings the *Veerya* of the medicine used in *Pichu* and *Veshtana* gets inside of the body. The *Bahya Snehana* implies all the *Snehana Karma* which is used topically on the external surface of skin. Basically, they are all various forms of topical drug delivery across the skin. There are many advantages of this method of drug delivery, such as sustained drug release, lower fluctuations in plasma drug levels, circumventing first-pass metabolism, improving patient compliance, and providing local (dermal) or systemic (transdermal) effects. The only difficulty in this method is the resistance offered by the barrier layer (stratum corneum) of the skin, which restricts the penetration and absorption of the drugs. However, this layer is more stringent on the water-based compounds than the lipid-based compounds. Thus, all the techniques can be considered as lipid-based nano delivery systems of bioactive agents through skin.

#### **Use of Moorchita Taila<sup>9</sup>**

*Moorchana* is the first step towards *Sneha Paka*, mainly aimed at removing *Durgandha* and increasing the potency of *Sneha*. Yet, no evidence of *Moorchana* is stated in *Vedas* and *Bruhatrayee*, but *Bhashajya Ratnavali* has described in detail the *Moorchana* of *Taila*. Most of the ingredients are *Vatahara* and of *Ushna Veerya*, which helps in the management of disease conditions. The ingredients used for *Moorchana* have their own therapeutic effects and also help in enhancing the shelf life of *Taila*. The word *Ama* in the context of *Taila* is not defined clearly. Probably, the water content existing in *Taila*, or maybe the factor that impaired the absorption of *Taila*, can be correlated to *Ama* and should be removed by the process of *Moorchana*. When *Taila* has undergone *Sanyoga Sanskara*, it adopts the *Sarvarogapahama* property.

## CONCLUSION

The overall Observations in the study revealed that maximum number of patients were females in the age group of 40-70 years belonging to Upper Middle class, Hindu religion, Married, having Vegetarian Diet, involving Homemakers, Businessmen, Teacher, Army, Fire Fighter and Office staff presenting with the *Lakshanas* of *Janusandhigata Vata*. In the present study, the effect of the treatment within the groups has shown statistically highly significant results in all the assessment parameters. The effect of treatment between the two groups has shown no significant result in all the assessment parameters, whereas comparing the mean ranks, the after-treatment effect in Group A on *Janusandhi Shoola*, Womac Score is comparatively better than Group B, and the after-treatment effect in Group B on *Janusandhi Shotha*, *Janusandhi Atopa* is comparatively better than Group A. Further studies on a large sample size are needed to explore the detailed beneficial effects of these two interventions. No adverse effects were observed during the course of the study.

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