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Clinical study on the effectiveness of *Vatagajankusha Rasa* with *Pippali Churna* and *Manjishta Kwatha* as *Anupana* in *Apabahuka* (Frozen Shoulder)

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ABSTRACT

Apabahuka is a *Vatavyadhi*, localizing around the *Amsapradesh* and thereby causing of *Amsa Bandha* as well *Aakuncana* of *Sira* leading to symptoms like *Bahupraspandita Hara*. *Amsashosha* can be considered as the preliminary stage of the disease where loss or dryness of the *Shleshakakapha* from the shoulder joint occurs. In the next stage, due to the loss of *Shleshakakapha* symptoms like pain during movement, restricted movement are manifested. *Vatagajankusha Rasa* with *Pippali Churna* and *Manjisthakwatha* as *Anupana* is mentioned in the treatment of *Apabahuka* under the *Vatavyadhichikitsa*. The duration of intervention is 7 days as per the reference. Hence this study is intended to validate the same. **Objective:** Considering the prevalence, and lifestyle effect on patients, to evaluate the effectiveness of *Vatagajankusha Rasa* and *Manjisthakashaya*, *Pippali Churna* in *Apabahuka*. (Frozen Shoulder). **Methodology:** Among 34 registered subjects 28 completed the course of treatment. They were administered with *Vatagajankusha Rasa* (125mg) with *Pippali Churna* (3gm) and *Manjishta Kwatha* (15ml) as *Anupana* before food twice daily for a period of 7 days. For statistical analysis subjective and objective parameters were assessed by Wilcoxon signed rank, McNemar test and paired T test. **Result:** In the parameters of *Apabahuka*, the intervention was found to be statistically significant in relieving the assessment parameters like *Amsa Sandhi Shoola*, *Bahupraspandita Hara* ($p < 0.005$). In Objective parameters like ROM of Shoulder significant relief was observed after statistical analysis. **Conclusion:** *Vatagajankusha Rasa* with *Pippali Churna* and *Manjishta Kwatha* as *Anupana* is effective in the management of symptoms of *Apabahuka*

Key words: *Apabahuka*; Frozen Shoulder; *Vatagajankusha Rasa*; *Pippali Churna*; *Manjishta Kwatha*.

INTRODUCTION

Apabahuka has two words. *Apa* means *Viyoga*^[1] (dysfunction) & "*Bahuka*" means *Bahu* (shoulder). "*Bahusthambo Apabahukaah*"^[2] which means stiffness in the shoulder joint. The management of '*Bahusosha*'^[3] that resembles *Apabahuka* is explained

under *Bahushirshagata* *Vatachikitsa*. *Bahupraspanditha Hara* is the cardinal feature of *Apabahuka* that occurs due to *Siraaakunchana*.^[4] Frozen shoulder is defined as a clinical syndrome characterized by painful restriction of both active and passive shoulder movements due to causes within the shoulder joint or due to non-shoulder causes.

Its causes are of two types, a) shoulder causes and b) non shoulder causes.

Shoulder causes: Problems directly related to shoulder joint which can give rise to frozen shoulder are tendinitis of rotator cuff, bicipital tendinitis, fracture and dislocations around the shoulder.^[5]

Non Shoulder Causes: problems not related to shoulder joint like diabetes, cardiovascular diseases with referred pain to the shoulder which keeps the joint immobile, a complication of Colle's fracture can

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lead to frozen shoulder. The reason could be prolonged immobilisation of the shoulder joint due to referred pain.

There are three classical stages in frozen shoulder:^[6] Stage of pain, Stage of stiffness, Stage of recovery.

Management of *Apabahuka* needs *Vatashamana*, *Dipana-Pachana* and *Shulaprashamana*. *Vatagajankusha Rasa* is a combination of *Vyosha*, *Rasa Bhasma*, *Vatsanabha*, *Karkatasringi*, *Haritaki* of which *Shunti*, *Maricha*, *Pippali* act as *Deepana*, *Pachana*. *Vatsanabha* has the property of *Vikasi*, *Vyavayi*, *Yogavahi*, helping in easy absorption. *Haritaki*, *Agnimantha*, *Karkatashringi* act as *Deepana*, *Kaphanissaraka*, *Vatashamaka*. *Rasa Bhasmas* are *Balya*, *Rasayana* and *Tridoshashamaka*. So *Vatagajankusha Rasa* with *Pippali Churna* and *Manjishta Kwatha* as *Anupana* has been taken for the clinical study.^[7]

METHODOLOGY

Source of data: Subjects of *Apabahuka* will be selected from Out Patient and In Patient Department of Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan.

Methods of collection of data

(A) Screening

A screening form was prepared with all aspects of history, signs and symptoms of *Apabahuka*.

(B) Diagnostic criteria

Diagnosis will be made on the basis of *Samanya Lakshana* of *Apabahuka* viz. *Bahupraspandahara*, *Amsa Sandhi Shoola* and symptoms of frozen shoulder.

(C) Inclusion criteria

1. Subjects who are willing to participate and sign the informed consent form
2. Subjects of either gender
3. Subjects aged between 40-70 years
4. Diabetic Patient with sugar level control

(D) Exclusion criteria

1. Subjects presenting with fracture or dislocation of shoulder joint
2. Uncontrolled Diabetes Mellitus and Hypertension
3. Any other systemic disorder
4. Pregnant and lactating women

(E) Laboratory investigations

X- Ray Shoulder joint - Anterio-posterior/ lateral view - to rule out fracture.

Study design

An open label, single arm clinical study on *Apabahuka* (frozen shoulder) (n=30) selected using the convenience (non-random) sampling technique with pre and post design conducted in tertiary *Ayurveda* hospital attached to the *Ayurveda* medical college located in district headquarters in southern India.

Intervention

Medicines

Vatagajankusha Rasa Tablet (125mg), 30 minutes before food with *Anupana*, 15ml *Manjishta Kwatha* and 3gm *Pippali Churna* twice daily for 7 days.

Assessment Criteria

Subjective and objective parameters were assessed using Constant Murley Score.

a. Pain : (Max 15 Points)

b. Activities of daily living : (Max 20 Points)

- Sleep
- Normal daily living
- Normal recreation activity
- Hand comfort

c. Movement : (Max 40 Points)

- Flexion
- Abduction
- External rotation
- Internal rotation

d. Strength: (Max 25 Points)**Statistical Methods**

Data was collected using case report form (CRF) designed by incorporating all aspects (Ayurveda & modern medicine) for the study. Such collected data was tabulated and analysed using SPSS (Statistical package for social sciences) version 23 by using appropriate statistical test. Demographic data and other relevant information were analysed with

descriptive statistics. Continuous data was expressed in mean +/- standard deviation, and nominal and ordinal data was expressed in percentage. Nominal & ordinal data were analysed using non parametric tests like, Wilcoxon's signed rank test, McNemar test. Continuous data was analysed using parametric test like, paired t as and when required. The changes (one tailed) with p value<0.05 were considered as statistically significant.

OBSERVATIONS AND RESULTS**Results of showing the effect of therapy on Amsa Sandhi Shoola**

<i>Amsasandhishoola</i>	BT		AT		N	P Value	Remarks
	Present	Absent	Present	Absent			
Right BT-AT	16	12	2	14	28	.000	S
Left BT-AT	12	16	2	10	28	.002	S

BT - Before Treatment, AT - After Treatment, N - Number

Results of showing the effect of therapy on Bahupraspandita Hara

<i>Bahupraspanda Hara</i>	BT		AT		N	P Value	Remarks
	Present	Absent	Present	Absent			
Right BT-AT	12	16	1	11	28	.001	S
Left BT-AT	8	20	2	6	28	.031	S

BT - Before Treatment, AT - After Treatment, N - Number

Results of showing the effect of therapy on Shoulder Abduction

Shoulder Abduction	Negative ranks			Positive ranks			Ties	Total	Z - value	P - value	Remarks
	N	MR	SR	N	MR	SR					
BT-AT RIGHT	14	7.50	105.00	0	.00	.00	14	28	-3.742	.000	S
BT-AT LEFT	10	5.50	55.00	0	.00	.00	18	28	-3.162	.002	S

MR - Mean Rank, SR - Sum of Ranks, N = Number

Results of showing the effect of therapy on Shoulder Flexion

Shoulder flexion	Negative ranks			Positive ranks			Ties	Total	Z -value	P - value	Remarks
	N	MR	SR	N	MR	SR					
BT-AT RIGHT	16	8.50	136.00	0	.00	.00	12	28	-4.000	.000	S
BT-AT LEFT	11	6.00	66.00	0	.00	.00	17	28	-3.317	.001	S

MR - Mean Rank, SR - Sum of Ranks, N = Number

Results of showing the effect of therapy on Shoulder Internal Rotation

Shoulder internal rotation	Negative ranks			Positive ranks			Ties	Total	Z -value	P - value	Remarks
	N	MR	SR	N	MR	SR					
BT-AT RIGHT	15	8.00	120.00	0	.00	.00	13	28	-3.873	.000	S
BT-AT LEFT	13	7.00	91.00	0	.00	.00	15	28	-3.606	.000	S

MR - Mean Rank, SR - Sum of Ranks, N = Number

Results of showing the effect of therapy on Shoulder external rotation

Shoulder external rotation	Negative ranks			Positive ranks			Ties	Total	Z -value	P - value	Remarks
	N	MR	SR	N	MR	SR					
Bt-at right	8	4.50	36.00	0	.00	.00	20	28	-2.828	.005	S
Bt-at left	5	3.00	15.00	0	.00	.00	23	28	2.236	.025	S

MR - Mean Rank, SR - Sum of Ranks, N = Number

Results of showing the effect of Constant murley score

Constant Murley Score	Paired Differences					T value	DF	P value
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
BT-AT	-12.60714	7.72365	1.45963	-15.60206	-9.61222	-8.637	27	.000

DISCUSSION

The condition in which the aggravated *Vata* in the *Amsapradesha* dries up the *Snayu* of shoulder joints

leading to *Amsasosa*; later, *Dosha* does the *Aakunchana* of the *Sira* of *Amsadesha* that condition is called as *Apabahuka*.^[8] *Bahupraspanditha Hara* is the

cardinal feature of *Apabahuka* that occurs due to *Siraaakunchana*.^[9]

Frozen shoulder is a painful condition presents with Restriction or pain, or both, on shoulder elevation and external rotation. It progresses in three phases, first phase is characterized by increasing pain during movement, without significant loss of motion, typically lasts 2-9 months. In phase two, lasting 4-12 months, the shoulder ROM become progressively limited, pain occurs mostly at end range. last stage can last up to 4 years and consists of resolution with persisting pain^[10]

Effect on *Amsa Sandhi Shoola*

Statistically significant improvement was noticed in *Amsa Sandhi Shoola* in 28 subjects. McNemar's test (P value <0.05) showed improvements in mean after treatment.

Remission of pain was recorded during follow up. Before the treatment the initial mean pain score was 3.8572 and which came down to 0.8572 after treatment. The observation shows the pain decreased in intensity in a week. This remission of the symptom after the treatment, is statistically significant (P<0.05).

Amsashoola is manifested as a result of *Nidanas* like *Atibhara Vahana*, *Vishamacheshta* leading *Vataprakopa* in *Amsapradesha*, leading to *Shoola*. *Karkatasringi* in *Vatagajankusha Rasa* is *Vatashamakadravya*. In previous studies on *Pistacia integerrima* (*Karkatashringi*) isolated from the *pisatacia integerrima* bark, demonstrated marked muscle relaxant effects in various animal-based models.^[11] The muscle relaxant potential of *pistagremic acid* was performed in many muscle relaxant paradigms including the rotarod test, the traction test, the inclined plane model and the climbing test.

Manjisthakashaya helps in pacifying the *Vridhdhavata* due to its *Ushnavirya* and *Madhura Rasa*. *Pippali*, *Manjishta*, *Vatsanabha* have *Shoolahara* activity due to glycosides, alkanoids and other bio active compounds present in them and help in reducing the pain.^[12]

Effect on *Bahupraspandita Hara*

Statistically significant improvement was noticed in *Bahupraspandita Hara* in 28 subjects after treatment. McNemar's test (P value <0.05) showed improvements in mean after treatment.

Bahupraspandita Hara is a major symptom in *Apabahuka* where active movements are restricted because of Pain and stiffness of the shoulder joint. Significant result was observed with degree of active movements after the treatment. Range of shoulder flexion showed an improvement following treatment. Mean range of flexion movement was 8.6071 degree before treatment and which improved to 9.5715 degrees after treatment. Increase in the range of flexion by about 39 degrees was found to be statistically highly significant (P<0.0001) as assessed by McNemar's test. Mean range of abduction movement was 89.048 degrees before treatment and which increased to 124.286 degrees after treatment. Increase in the range of flexion by about 40 degrees was found to be statistically highly significant (P<0.0001). The mean range of internal rotation was 19.048 degrees before treatment and which increased to 40.952 degrees after treatment.

Increase in the range of flexion by about 22 degrees was found to be statistically highly significant (P<0.0001). Mean range of external rotation movement was 17.143 degrees before treatment and which increased to 56.190 degrees after treatment. Increase in the range of external rotation by about 40 degrees was found to be statistically highly significant (P<0.0001) as assessed by paired t test. Range of abduction against resistance of 1 kg was 38.810 degrees before treatment and which increased to 53.300 degrees after treatment. increase in the range of abduction against resistance of 1kg was by about 16.5 degrees was found to be statistically highly significant (P=0.002) It is interesting to quote the significant improve in the Functional ability of the shoulder joint which was assessed according to the parameters of Constant and Murely.

Before treatment the mean score was 31.619 improved to 60.952 with the difference in mean score

of 29.333 which was statistically highly significant where $P < 0.001$ as assessed by paired 't' test.

In this study maximum numbers of subjects were diabetic, and also were involved the strenuous exercise, *Bahupraspandita Hara* (stiffness) develops. The wounded muscle which has increased glucose uptake is infiltrated with a large number of inflammatory cells. Macrophages which are the predominant inflammatory cells in wounded muscle can increase glucose oxidation by epididymal fat pads,^[13] also previous studies revealed positive association between high AGE's levels and declined decreased muscle properties (strength, power and mass) and increased physical frailty, thus restriction of movements develops.

Manjishta Kashaya acts as *Sothahara* (anti-inflammatory), because of the presence of Rubimallin. This reduces the inflammation and prevents the further glucose deposition over the injured muscle and enhancing the healing process by improving the circulation.

Ingredients of *Vatagajankusha Rasa* like *Rasasindhura*, *Lohabhasma*, *Swarna Makshika*, *Gandhaka*, *Vatsanabha*, *Tankana*, *Trikatu* with the *Bhavana* of *Nirgundi* and *Mundi Swarasa* makes the drug more potent against *Vata* and *Kapha* disorders.

Vatsnabha is *Vata Hara* and *Rujapaha*. Its *Vikasi*, *Vyavayi*, *Yogvahiguna* makes it easy to reach the cellular level thus improving the circulation and reducing inflammation.

Shudha Haratala, *Shunti*, *Pippali* act as *Vatashamaka*, due to its *Ushnavirya* and *Snigdha Guna*, might have improved *Snigdha* inducing the lubrication and ease for range of movements, reducing *Bahupraspandita Hara*.

Discussion on mode of action of drug

Vatagajankusha Rasa is a combination of *Rasa Aushadhis* like *Rasa Sindhura*, *Lohabhasma*, *Swarnamakshikabhasma*, *Gandhaka*, *Haratala*, *Tankana* and *Dravyas* like *Haritaki*, *Karkatasringi*,

Vatsanabha, *Shunti*, *Pippali*, *Agnimantha* with *Bhavana* in *Nirgundiswarasa* and *Mundi Swarasa*.

Vatsnabha is *Kaphavata Hara* and *Rujapaha*. It's *Vikasi*, *Vyavayi*, *Yogvahiguna* makes it easy to reach the cellular level. *Pippali*, *Maricha*, *Shunti* are *Shoolaprashamanadravyas*. *Karkatasringi*, *Haritaki*, *Agnimantha* work as *Vatashamaka*. *Nirgundi*, *Agnimantha*, *Lauhabhasma*, *Shudhagandhaka* and *Tankanabhasma* act as *Shothahara*. *Shunti* acts as *Srotoshodhaka* and *Raktaprasadaka*. *Pippali*, *Manjishta*, *Vatsanabha* have analgesic activity due to glycosides, alkanoids and other bio active compounds present in them and helps in reducing the pain.^[14]

Rasaushadi in the *Vatagajankusha Rasa* has to undergo *Marana*, after that *Rasa Bhasmas* become more potent and fine particles. Due to which absorption into the body gets rapid, with the *Manjishta Kashaya* as catalyst for circulation and nourishment to the injured muscle. *Rasa Aushadis* penetrate the intestinal barrier by endocytosis, phagocytosis or persorption and transit to the blood stream, reducing the further cell injury process and providing proper circulation for healing by reducing the inflammation.^[15]

Shudharatala, *Shunti*, *Pippali* act as *Vatashamaka*, due to its *Ushnavirya* and *Snigdha Guna*, might have improved *Snigdha* inducing the lubrication and ease for range of movements, reducing *Bahupraspandita Hara*.

CONCLUSION

Vatagajankusha Rasa contains the main ingredients like *Rasa Sindhura*, *Lohabhasma*, *Swarnamakshikabhasma*, *Shunthi*, *Pippali*, *Vatsanabha* and hence acts on *Vata* and *Kapha Dosh* which shows its action on both variants of *Apabahuka*. *Vatagajankusha Rasa* with *Pippali Churna* and *Manjishta Kwatha* as *Anupana* showed marked effect on the signs and symptoms of *Apabahuka - Amsa Sandhi Shoola*, *Bahupraspandita Hara*. Range of movements of Shoulder joint showed significant improvement after treatment. *Vatagajankusha Rasa* orally in the dose of 125 mg twice daily with *Pippali*

Churna (3gm) and *Manjishta Kwatha* (15ml) as *Anupana* for 7 days is effective in *Apabahuka*.

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