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# A Study on Frozen Shoulder and its clinical management through *Nasaapana* and *Nasya*

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## ABSTRACT

The unique position of man as a master mechanic of the animal kingdom is because of skilled movements of his hands and when this shoulder joints get obstructed, we call it as *Apabahuka* (Frozen shoulder), we do not find satisfactory management in modern medical science. Various effective treatment modalities have been mentioned which reverse the pathogenesis, *Shodhana* is advised initially followed by *Shamana* therapies. In the present study 30 patients were selected incidentally and placed randomly into two groups A and B, with 15 subjects in each group. Group A received *Amapachana* with *Panchakola Churna*, *Jambeera Pinda Sweda* and *Nasya Karma*. Group B received *Amapachana* with *Panchakola Churna*, *Jambeera pinda Sweda* and *Nasaapana*. In both the groups two months follow up was done. Both groups showed significant improvement in the signs and symptoms of *Apabahuka* as well as the activities of daily livings, thereby improving the quality of life of the patients. *Nasya Karma* and *Nasaapana* provided highly significant results in all the symptoms of *Apabahuka*. In the present study as per the clinical data, *Nasaapana* is found to be more effective than *Nasya Karma*.

**Key words:** *Apabahuka*, Frozen shoulder, *Nasya Karma*, *Nasaapana*.

## INTRODUCTION

Amongst the category of diseases our *Acharyas* have considered *Vata Vyadhis* as an important entity. They have mentioned these *Vata Vyadhis* under the heading of *Ashta Mahagadas*<sup>[1]</sup> the disease *Apabahuka* is one among them, which is *Vataja Nanatmaja Vyadhi*<sup>[2]</sup> according to Sushruta and *Vata Kapha Pradhana Vyadhi* according to Madhava.<sup>[3]</sup>

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It has been estimated by research group that the hand performs approximately thousand different functions in an ordinary day today's activity.<sup>[4]</sup> *Apabahuka* is one such disease which hampers most of the foresaid functions of the hand.

Loss of *Bahu Praspandana*, *Stambha* and *Sula* at the shoulder joint are the cardinal features of *Apabahuka*.<sup>[5]</sup>

Even though the term *Apabahuka* is not mentioned in the *Nanatmaja Vata Vyadhi*, *Acharya Sushruta*<sup>[6]</sup> have considered *Apabahuka* as a *Vata Vyadhi*. In *Madhava Nidana*<sup>[7]</sup> two conditions of the disease has been mentioned, *Amsa Shosha* and *Apabahuka*. *Amsa Shosha* can be considered as the preliminary stage of the disease where loss or dryness of *Sleshaka Kapha* at *Amsa Sandhi* occurs.

In the next stage of *Apabahuka*, due to the loss of *Shleshaka Kapha* symptoms like *Shoola* during

movement, restricted movements etc. are manifested.

While commenting on this, *Vijayarakshita* in his *Madhukosha Teeka* has mentioned that *Amsa Sosha* is produced by *Dhatu Kshaya* i.e. *Shudha Vata Janya* and *Apabahuka* is *Vata Kapha Janya*.

*Apabahuka* in modern can be correlated to Frozen Shoulder.<sup>[8]</sup> In the realm of conventional medicine this illness is managed by analgesics, physiotherapy, oral corticosteroids, intra articular corticosteroid injections, capsular distention, manipulation under anesthesia and arthroscopic capsular release.

In our science *Vata Vyadhis* can be relieved by therapies like *Abhayanga*, *Swedana*, *Sneha Pana*, *Nasya Karma*, *Vasti Karma* and *Shamana Oushadhi Prayoga* etc.

*Chikitsa Sutra* of *Apabahuka* includes *Nasya*, *Uttarabhouktika* *Snehapana*, *Nasaapana*, *Shamanaushadhi Prayoga* etc. The drugs that are capable of resolving the samprapti of *Apabahuka* are advocated.

Considering all the above points, looking into the plight of patients with *Apabahuka*, the therapies like *Nasya*<sup>[9]</sup> with *Mahamasha Taila*, *Nasaapana*<sup>[10]</sup> with *Dashamooli Balamasha Kwatha*, were used in this study.

## MATERIALS AND METHODS

### Study design and patient selection

This was a randomized single blind, comparative clinical study. Patients attending O.P.D. and I.P.D. of Kayachikitsa, Ayurveda Mahavidyalaya Hospital, Hubli, irrespective of sex, religion etc. who had presented the clinical symptoms of *Apabahuka* were included in to the study.

An elaborative case taking proforma was specially designed for the purpose of incorporating all aspects of the disease on Ayurvedic parlance. Informed consent was taken from the patient before including them in the trial.

### Inclusion and exclusion criteria

Patients in between 20 to 70 years of age with clinical features of *Apabahuka* (frozen shoulder) and patients fit for *Nasya* and *Nasaapana Karma* were included in the trial. Patients with auto immune disorders like SLE, RA etc., post traumatic injuries, dislocation of shoulder joint, uncontrolled metabolic disorders like Diabetes mellitus were excluded from the trial.

### Grouping and Posology

In the present study, 30 patients were selected incidentally and placed randomly into two groups, Group A and Group B, with 15 subjects in each group.

#### Group A

Under this group 15 patients were taken for the clinical trial and were put on the following therapy.

**Amapachana:** It was done with *Panchakola Churna*.

*Matra:* 5 gms/bid.

*Anupana:* *Ushnodaka*.

*Aushadha Kala:* *Anannakala* (before food)

This was given till the appearance of *Sarvadehika Nirama Lakshana*.

**Jambeera Pinda Sweda:** It was done with the prepared *Pottalis*.

#### Nasya Karma

*Purvakarma:* *Mukhabhyanga* and *sweda* were performed till samyak laxanas were seen.

*Pradhana Karma:* *Nasya karma* (*Marsha nasya*) was done with *mahamasha taila*.

*Paschyat Karma:* *Kavala* and *Gandoosha* were administered with *Usnodaka*.

#### Group B

Under this group 15 patients were taken for clinical trial and were put on the following therapy.

#### Amapachana

It was done with *Panchakola Churna*

*Matra:* 5 gms/bid

*Anupana: Ushnodaka.*

*Oushadha Kala: Anannakala.*

This was given till the appearance of *Sarvadehika Nirama Lakshana*.

**Jambeera Pinda Sweda:** It was done with the prepared *Pottalis*.

### **Nasaapana**

*Purvakarma: Mukhabhyanga* and *Sweda* were performed till *Samyak Laxanas* were seen.

*Pradhana Karma: Nasaapana* was done with *Dashamooli Bala Masha Kwatha*.

*Paschyat Karma: Kavala* and *Gandoosha* were administered with *Usnodaka*.

### **Source of Materials**

All the raw materials were collected and prepared classically in the Pharmacy of Rasashastra and Bhaishajya Kalpana, Ayurveda Mahavidyalaya, Hubli.

### **The following materials were utilized for clinical trial**

1. *Panchakola Churna*<sup>[11]</sup>
2. *Jambeera Pinda Sweda*<sup>[12]</sup>
3. *Mahamasha Taila*<sup>[13]</sup>
4. *Goniometer*<sup>[14]</sup>
5. *Dashamool Bala Masha Kwatha*<sup>[15]</sup>
6. Specially designed *Nasaapana Yantra*

### **Specially designed Nasaapana Yantra**

After conducting the pilot study with syringe, *Nethi pot*, *Nasya Yantra* and dropper, this special *Yantra* was prepared. This *Yantra* was designed with the concept of *Basti Yantra* which contains *Putaka* and *Netra*. Here in the present study the bulb of the B.P. apparatus and a needle holder which is cut and made open at the top end were taken. When the *Kwatha* becomes ready to administer, 25 ml of *Kwatha* was added to the bulb with the help of 5 ml syringe. Needle holder was then fixed to the bulb. During the administration of *Nasaapana* all aseptic precautions were taken.

### **Diagnosis**

Diagnosis was entirely based on the signs and symptoms of *Apabahuka* mentioned in Ayurvedic and Modern classics.

1. *Sandhi Graha* (Stiffness of joint)
2. *Sandhi Shula* (Joint Pain).
3. Localized Swelling
4. On palpation-tenderness
5. Movements restricted (via Goniometer).

### **Laboratory Investigations**

- a. Hb %
- b. TC, DC, ESR
- c. RBS
- d. RA test.

### **Criterion for assessment**

The improvement of patients was assessed on the basis of relief in the signs and symptoms of disease. To analyze the efficacy of the drug, scoring was given statistically to each symptom. According to severity of the symptoms, the grading was given as below;

### **Subjective Parameters**

#### **A) Main symptoms**

##### **1) Bahu Praspanditahara**

- |                                                    |     |
|----------------------------------------------------|-----|
| a) Can do work unaffectedly                        | - 0 |
| b) Can do strenuous work with difficulty           | - 1 |
| c) Can do daily routine work with great difficulty | - 2 |
| d) Cannot do any work                              | - 3 |

##### **2) Shoola**

- |                                                    |     |
|----------------------------------------------------|-----|
| a) No pain                                         | - 0 |
| b) Mild pain can do strenuous work with difficulty | - 1 |
| c) Moderate pain, can do normal work               | - 2 |
| d) Severe pain, unable to do work at all           | - 3 |

**B) Associated symptoms****1) Amsa Shosha**

- |                                          |     |
|------------------------------------------|-----|
| a) No wasting                            | - 0 |
| b) Mild wasting, can do work             | - 1 |
| c) Wasting present, work with difficulty | - 2 |
| d) Wasting present, cannot move          | - 3 |

**Objective Parameters****1) Localized Swelling**

- |                                 |     |
|---------------------------------|-----|
| a) No swelling                  | - 0 |
| b) Slight                       | - 1 |
| c) Moderate                     | - 2 |
| d) Bulging beyond joint margins | - 3 |

**2) Palpation-tenderness**

- |                                                         |     |
|---------------------------------------------------------|-----|
| a) No tenderness                                        | - 0 |
| b) Patient complains of pain                            | - 1 |
| c) Patient complains of pain and winces                 | - 2 |
| d) Patient complains of pain, winces and withdrew joint | - 3 |

**3) Sandhi Graha: (Goniometer readings)****A) Forward flexion**

- |                           |     |
|---------------------------|-----|
| a) Up to 180 <sup>0</sup> | - 0 |
| b) Up to 135 <sup>0</sup> | - 1 |
| c) Up to 90 <sup>0</sup>  | - 2 |
| d) Up to 45 <sup>0</sup>  | - 3 |
| e) Cannot flex            | - 4 |

**B) Hyper Extension**

- |                          |     |
|--------------------------|-----|
| a) Up to 50 <sup>0</sup> | - 0 |
| b) Up to 30 <sup>0</sup> | - 1 |
| c) Up to 10 <sup>0</sup> | - 2 |
| d) Cannot hyper extense  | - 3 |

**C) Abduction**

- |                           |     |
|---------------------------|-----|
| a) Up to 180 <sup>0</sup> | - 0 |
| b) Up to 135 <sup>0</sup> | - 1 |
| c) Up to 90 <sup>0</sup>  | - 2 |
| d) Up to 45 <sup>0</sup>  | - 3 |
| e) Cannot abduct          | - 4 |

**D) Internal rotation**

- |                          |     |
|--------------------------|-----|
| a) Up to 90 <sup>0</sup> | - 0 |
| b) Up to 60 <sup>0</sup> | - 1 |
| c) Up to 30 <sup>0</sup> | - 2 |
| d) Cannot rotate         | - 3 |

**E) External rotation**

- |                          |     |
|--------------------------|-----|
| e) Up to 90 <sup>0</sup> | - 0 |
| f) Up to 60 <sup>0</sup> | - 1 |
| g) Up to 30 <sup>0</sup> | - 2 |
| h) Cannot rotate         | - 3 |

**OBSERVATION AND RESULTS**

A maximum number of study subjects *i.e.* 10 (33.33%) subjects were of 51-60 years Age, 09 subjects (30.00%) were between 61-70 years, 08 subjects (26.66%) were between 41-50 years, 02 subjects (06.66%) were between 20-30 years. And 01 subject (03.33%) were between 31-40 years. This shows the high incidence in *Madhyamavastha*. This age is golden period for individuals where they are more active and are likely to develop *Apabahuka*.

A Maximum number of study subjects *i.e.* 20 subjects (66.67%) were having *Krura Koshta* and 10 subjects (33.33%) were having *Madhyama Koshta*. It is clear that *Krura Kostha* persons are more affected because of *Vata Pradhanyata*.

A Maximum number of study subjects *i.e.* 17 subjects (56.67%) were of *Vata-Kapha Prakruti*, 10 subjects (33.33%) were of *Vata-Pitta Prakruti*, 03 subjects (10.00%) had *Pitta-Kapha Prakruti*.

It can be said that *Vatakaphaja Prakriti* persons develop the disease more, because of the similar *Dosha* involvement in the disease.

**Comparative efficacy of the therapies in Group A and Group B**

The mean of *Bahu Prasandithara* in Group A was 0.46, SD is 0.63 and SE is 0.16. In Group B, the mean of *Bahu prasandithara* was 2.2, SD is 0.67 and SE is 0.17. The comparative efficacy of Group A with Group

B showed statistically highly significant ( $p < 0.001$ ) result with  $t'$  value of 7.21.

The mean of *Shoola* in Group A was 1.26, SD is 0.45 and SE is 0.13. In Group B, the mean of *Shoola* was 2.33, SD is 0.61 and SE is 0.15. The comparative efficacy of Group A with Group B showed statistically highly significant ( $p < 0.001$ ) result with  $t'$  value of 5.37.

The mean of *Amsashosha* in Group A was 0.13, SD is 0.35 and SE is 0.09. In Group B, the mean of *Amsashosha* was 0.6, SD is 0.73 and SE is 0.19. The comparative efficacy of Group A with Group B showed statistically significant ( $p < 0.02$ ) result with  $t'$  value of 2.21.

The mean of Swelling in Group A was 0.93, SD is 0.88 and SE is 0.22. In Group B, the mean of Swelling was 0.66, SD is 0.81 and SE is 0.21. The comparative efficacy of Group A with Group B showed statistically not significant ( $p < 0.10$ ) result with  $t'$  value of 0.85.

The mean of Tenderness in Group A was 0.73, SD is 0.59 and SE is 0.15. In Group B, the mean of Tenderness was 0.66, SD is 0.72 and SE is 0.18. The comparative efficacy of Group A with Group B showed statistically not significant ( $p < 0.10$ ) result with  $t'$  value of 0.27.

**Table 1: Showing comparative efficacy of the therapies in Group A and Group B.**

Parameters	No of Pts	Group A			Group B			t'	p	Remarks
		X	S.D (±)	S.E(±)	X	S.D (±)	S.E(±)			
Bahu praspandithar	30	0.46	0.63	0.16	2.2	0.67	0.17	7.2	>0.001	HS
Shoola	30	1.26	0.45	0.13	2.33	0.61	0.15	5.3	>0.001	HS
Amsa Sosha	09	0.13	0.35	0.09	0.6	0.73	0.19	2.2	<0.02	S
Swelling	17	0.93	0.88	0.22	0.66	0.81	0.21	0.8	<0.10	NS

Tenderness	18	0.73	0.59	0.15	0.66	0.72	0.18	0.2	<0.10	NS
Forward flexion	30	0.80	0.56	0.14	2.80	0.77	0.20	8.1	>0.001	HS
Hyper Extension	30	0.53	0.74	0.19	2.13	0.91	0.23	5.2	>0.001	HS
Abduction	30	0.60	0.82	0.21	2.40	0.91	0.23	5.6	>0.001	HS
Internal rotation	15	0.60	0.82	0.21	0.80	0.77	0.20	0.6	<0.10	NS
External rotation	30	0.53	0.74	0.19	2.06	0.70	0.18	5.8	>0.001	HS

## DISCUSSION

For any living organism the worst tragedy is said to be the Life without movements. That can be one of the main reasons for Ayurvedic literatures considering *Vataja Vikaras* more important compared to disorders caused by other *Doshas*. *Apabahuka* is one among those *Vata Vyadhi*, which results in *Karmakshaya* of *Bahu*.

In a developing country like India where agriculturists and laboures form a major population, the incidence of *Apabahuka* is more.<sup>[16]</sup>

The specific *Nidana* of *Apabahuka* have not been separately mentioned. However the *Nidanas* of *Vatavyadhi* in general may be considered as the *Nidana*. As per the symptomatology and pathogenesis *Apabahuka* can be correlated to frozen shoulder as said in modern science because of the presenting symptoms like *Shula* (Initial pain during freezing stage) and *Stabdhatta* (restricted range of movements of the shoulder joint) etc. The etiology is also similar like *Ativyayama*, (excessive usage), *Vishama Chesta* (irregular movements) and *Marnabhighata* (Any injury to the shoulder including tendinitis, bursitis, and rotator cuff injury)

### Mode of action of *Nasya*

Acharya Vagbhata's quotation *Naasa Hi Shirasodwaram*<sup>[17]</sup> states that, nose is the easiest and closest opening for conveying the potency of medicines to the cranial cavity. The *Nasya Dravya* acts by reaching '*Sringataka Marma*' from where it spreads into various *Strotas* (vessels and nerves) and brings out vitiated dosha from the head. Acharya Sushruta considers *Shringhataka Marma* as a *Sira* and *Sadyopranahara Marma*<sup>[18]</sup> and as a composite structure consisting of four *Siras* in connection with four sense organs- viz, nose, ear, eye and tongue.

The entry of drugs in to the brain can be understood by the following 3 concepts;

1. By general blood circulation after absorption through mucous membrane.
2. The direct pooling in to venous sinuses of brain via inferior ophthalmic veins.
3. Absorption directly in to the cerebrospinal fluid.

Apart from the small veins entering cavernous sinuses of the brain, a pair of venous branch emerging from alae nasi will drain into facial vein. The ophthalmic veins on the other hand also drain into cavernous sinuses of the meninges and in addition to this, neither the facial vein nor the ophthalmic veins have any valves. Therefore, there are more chances of blood draining from facial vein in to the cavernous sinus in the lowered head position.

The nasal cavity directly opens in to frontal, maxillary and sphenoidal air sinuses. Epithelial layer is also continuous throughout the length. The momentary retention of drug in nasopharynx and suction causes oozing of drug material in to air sinuses. These sites have rich blood vessels entering the brain and meninges through the existing foramina in the bones. Therefore, there are better chances of drug transportation in this path. One can see in to the truth of narration made by Vagbhata, here the drug administered enters the para nasal sinuses. That is *Shringhataka* where the ophthalmic veins and the other veins spread out. The sphenoidal sinuses are in close relation with intra cranial structures. The

mentioning of the *Shringataka* in this context seems to be more reasonable.

Myelin sheath is the first covering of nerve fiber which is composed of lipid material. Blood- brain barrier is highly permeable for lipid substances, and substances which are fat-soluble. Therefore, these substances can pass easily through the blood-brain barrier and exert their action. The lipid contents of "*Mahamasha Taila*" may pass through the blood-brain barrier easily due to its transport, some of the active principles may reach up to certain levels in the nervous system to exert their *Vataghna* property. To conclude, *Nasya Karma* with *Mahamasha Taila* helps in *Apabahuka* by its *Vatashmana* and *Brumhana Karma*.

### Mode of action of *Nasaapana*

Many nerve endings which are arranged in the peripheral surface of mucous membrane i.e. olfactory, trigeminal etc. will be stimulated by *Nasaapana Dravya* and impulses are transmitted to the central nervous system. This results in better circulation and nourishment of the organs. Many drugs absorbed through the rich blood supply of the nasal mucosa enter the systemic circulation more rapidly than when they are administered orally.

Luke warm *Kashaya* was preferred to administer in this study as because *Sheeta Kashaya*, which creates irritation in nasal membranes and also exaggerate the gag reflex during administration (a normal reflex action caused by contraction of pharynx muscles when the posterior pharynx is touched) so there are chances of contents getting refluxed and entry into the wrong passage also.

Most of the drugs described for *Nasaapana* therapy have got *Katu*, *Ushna* and *Teekshna* properties. These drugs produce *Draveekaranam* and *Chedana* of vitiated *Dosha*. The *Kashaya Rasatmaka* drugs like *Bilwa* (*aegle marmelos*), *Agnimantha* (*premna integrifolia*), *Syonaka* (*oroxylum indicum*), *Patala* (*stereospermyn suaveolens*), *Bala* (*sida cardifolia*) etc. produce astringent effect while *Madhura Rasatmaka* drugs like *Shalaparni* (*desmodium gangeticum*), *Prisnaparni* (*uraria picta*), *Gokshura* (*tribulus*

*terrestris*) and *Masha* (black gram) produce cooling and nourishing effect.

*Acharya* Chakradatta specifies to add *Taila* and *Ghrita* to the *Kashaya*.<sup>[20]</sup> The specific quantity of this *Yamaka Sneha* is not mentioned. In the present study 10 drops each of *Mahamasha Taila* and *Goghrita* was added to the prepared *Kashaya*.

However, the major limitation with *Nasya* is the poor contact of the formulations with the nasal mucosa. Many attempts have been made in the recent past to increase the residence time of drug formulations in the nasal cavity, resulting in improved nasal drug absorption. Researchers became interested in the nasal route for the systemic delivery of medication due to high degree of vascularization and permeability of the nasal mucosa. Hence in *Nasaapana* when the *Kashaya* in the larger dose is poured continuously definitely has the more residence time of *Aushadha Dravya* as compared to that of *Nasya*. Thus better nasal drug absorption may take place.

## CONCLUSION

To Conclude, The effect of *Jambeera Pinda Sweda* and *Nasaapana* helps in relieving the disease more drastically without reoccurrence. Even in patients with long standing *Madhumeha*. Although *Nasya Karma* was significant in relieving most of the symptoms whereas *Nasaapana* provided highly significant results in relieving all most all the symptoms of *Apabahuka*. In present study as per the clinical data, *Nasya* and *Nasaapana* are definitely effective in the management of *Apabahuka*, but '*Nasaapana* was more effective than *Nasya Karma*.

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