



Review Article

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Role of Nasya Karma (Nasal Instillation Therapy) in Apabahuka (Frozen Shoulder)– A qualitative systematic review

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ABSTRACT

Background: With an incidence of 3%-5% in the general population and up to 20% in people with diabetes, peak incidence of frozen shoulder is more common in women and in manual workers between the age of 40 and 60yrs. Though multiple interventions have been studied on the frozen shoulder, the complete and the effective treatment is indefinite. Nasya karma is one among the panchakarma therapies of Ayurvedic system of medicine which can deliver the potential effects to the patients of frozen shoulder or apabahuka. **Purpose:** The objective of this study was to review the case reports and case series that are published on nasya karma and apabahuka or frozen shoulder. **Design:** Systematic review. **Methods:** PubMed/MEDLINE, Cochrane (CENTRAL), EMBASE, Google Scholar, TKDL, AYUSH and DHARA databases were screened from inception until March 8th, 2020. References of the full text articles were screened and selected articles by searching manually as a next step. Based on the pre-specified inclusion criteria articles were screened and finally 5 case reports and 0 case series were included for the study. **Results:** All the 5 studies included in the review administered nasya karma to the patients suffering from apabahuka or frozen shoulder and assessed pain, severity of the pain, VAS (visual analogue scale), stiffness, ROM (Range of movements) like flexion, extension, abduction, adduction, internal rotation and external rotation, forward elevation, lateral elevation, restricted movements and constant assessment scale of shoulder joint before and after the treatment which showed significant improvement in all the parameters. **Conclusions:** Nasya karma, one of the panchakarma therapies in Ayurvedic system of medicine constitutes the prime modality of treatment in the management of jatru-urdhwagata rogas mainly apabahuka or the frozen shoulder. Though present review showed significant changes in all the parameters, there are several limitations besides the quality of reporting, that is generally low in the included case reports. In addition, this review provides a comprehensive knowledge that may assist the researcher as a supplementary by giving an intuition for the execution of RCT's and clinical studies further on the domain studied. Having negligible number of systematic reviews in Ayurveda and absence of systematic reviews on case studies or reports and series, this review may serve as a preliminary step towards conducting more systematic reviews in Ayurvedic system of medicine which is the need of hour..

Keywords: Nasya karma, Apabahuka, Frozen shoulder, Case reports, Case series.

INTRODUCTION

Descriptive studies that present patient in their natural clinical setting are referred to as the case reports, case series or case studies. Case reports are the ones that include one, three or fewer patients. Case series include more than one to minimum 10 patients with similar features or complaints. These types of studies provide us the illustrations in the practice of medicine and may contribute to the acquisition of additional knowledge in the literature by creating the new research questions. The studies that furnish the in-depth analyses or experiential inquiries of a person or group in their real-world setting are the case studies and these are also known as the qualitative research methods that focuses on the contextual analysis of several events or conditions and their relationships [1]. While case reports provide the clues regarding the emerging epidemics and the recognition of previously unrecognized syndromes for the senior physicians, for novice investigators, it serves as a starting point that encourages and prepares them to seek more contextual writing experiences for future research investigations [2].

Frozen shoulder is also referred to as adhesive capsulitis and is defined as "a condition of uncertain etiology, characterized by significant restriction of both active and passive shoulder motion that occurs in the absence of a known intrinsic shoulder disorder" [3]. Apabahuka or the Frozen shoulder is thought to have an incidence of 3%-5% in the general population and up to 20% in those with diabetes.

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This disorder is one of the most common musculoskeletal problems seen in orthopedics [4]. Its incidence ranges between 40 and 60yrs and is found more common in women and manual workers [5, 6]. In 14% to 20% of patients, bilateral contemporaneous frozen shoulder is observed with involvement of the other shoulder with similar symptoms [7].

Severe pain that usually worsens at night, insidious shoulder stiffness, and near-complete loss of passive and active external rotation of the shoulder are experienced by the patients with frozen shoulder. [8] A patient suffering from the frozen shoulder passes through the three painful phases, such as [9] a) painful freezing phase with no history of injury, pain and stiffness around the shoulder with a nagging constant pain that gets worse at night. This occurs with the duration of ten to thirty six weeks with little response to non-steroidal anti-inflammatory drugs. b) adhesive phase, where the pain gradually subsides and is observed only at the extreme movements, but stiffness becomes constant and this occurs with four to twelve months of duration. c) resolution phase is observed with spontaneous improvement in the range of movement with the duration of twelve to forty two months [10], but with poor quality of life due to the restriction of both active and passive ranges of their shoulder mobility which follows the adhesive phase [11-13]

Frozen shoulder is often observed as the primary or secondary to the several diseases, such as diabetes mellitus, stroke, local shoulder issues, and many others as its etiology is still poorly understood [14-16]. Though multiple interventions have been studied on the frozen shoulder, the complete and the effective treatment is indefinite. This includes oral medications, corticosteroid injections, exercise, joint mobilization, distension, acupuncture, manipulation, nerve blocks and surgery etc [13].

The only system of medicine of ancient India practicing since ages, the holistic principles focusing on the positive and the personalized health and originated in India is Ayurveda, one of the ancient yet living health traditions [19]. Ayurvedic science and its basic principles are practiced in this modern era too by applying it for the management of pandemic Covid-19 by improving the immunity of the individual and may be valid even today. The quest for new knowledge through research, development and newer applications is always required for the science to develop and showcase its efficacy and taking the science towards evidence based approach. Due to modernization, the complete scenario of diseases has changed with new viruses, etiology, including understanding and mode of manifestation of disease. The geo-climatic environments such as plants, animals and microbes have undergone diversity. Human lifestyles, behavior, and even genetics have undergone modifications. Constant research with larger studies on safety, quality and efficacy are imperative for Ayurvedic science including drugs and procedures. Systematic documentation and critical analysis of clinical practice are necessary. Clearly, classical Ayurveda of yesteryears cannot be blindly practiced without contemporary modifications [20].

To review the available evidence in the right perspective is the need of hour in Ayurveda and these can be obtained from two main sources or the evidences such as historical, classical and clinical practice and other sources like scientific research studies including Ayurvedic theories, medicines and procedures. The present situation demands critical

analysis of Ayurvedic clinical practice and scientific evidence based research to make the science in par with Modern medicine [19].

Pañcakarma is one of the specialized therapeutic applications of Ayurveda which not only cleanses the entire bodily system but is also considered as the drug delivery method to target the sites. *Pañcakarma* has wide field of applications such as *śodhana* (purification), *brhmana* (nourishing therapy) or *śamana* (palliative measures). *Nasya* (nasal medication) which is one among *pañcakarmas*, delivers drug to the brain, thereby acting on whole body. [21] It plays role in majority of the conditions arising due to pathologies of *ūrdhvāṅga* (supra clavicular region). "Nasa hi siraso dwaram tena taddapya hanthi tana". Nose is the gate way of head; hence it acts as inlet for the *Nasya Karma* [22].

Frozen shoulder in Ayurveda can be equated with *apabahuka* or *avabahuka* in Ayurveda based on its distinctive features. In Ayurvedic medical science, *apabahuka* is managed through various therapeutic modules among which *nasya karma*, one of the therapeutic procedures is considered as the prime modality in the management of *urdhwajatrugata rogas* (diseases of the upper part of the body).

In research, systematic reviews forms the higher level of evidence and aims to identify, evaluate, and summarize the findings of all relevant individual studies over a health-related issue, thereby making the available evidence more accessible to decision makers. [23] Regarding the systematic reviews on *nasya karma* and *apabahuka*, as there were no studies available on the present domain, the present review was planned and effort was made to collect all the case studies and case series on the same and systematically review the particulars including the case details, age, sex, type of the intervention, clinical outcomes and conclusions etc. The study also observed the adverse events that were reported by the authors.

METHODOLOGY

In the systematic review, PRISMA checklist (Preferred Reporting Items for Systematic Reviews and Meta-analyses) was followed for all key aspects [24].

Search Methods

In this exploratory search, PubMed, Cochrane (CENTRAL LIBRARY), EMBASE, Google Scholar, TKDL (Traditional Knowledge Digital Library), AYUSH Research portal and DHARA were searched from the time of inception until March 8th, 2020 using the following strategy: ("Nasya"[All Fields] OR ("Nasya"[All Fields] AND "karma"[All Fields])) AND ("case reports"[Publication Type] OR "case report"[All Fields]). In the initial search, abstracts were identified, screened and those studies that included the *nasya karma* as the intervention either primary or secondary were included for the final review. The database with its search strategy is displayed in Table 1. Manual search was conducted for reference lists of all identified original articles and reviews. Ayurveda journals like JAIM, AYU, AYUSHDHARA IJAPR, IJRAP etc were reviewed in addition.

Eligibility Criteria

Original English language case reports and case series published in peer-reviewed journals were eligible. Studies involving *nasya karma* as

the pradhana karma (main intervention/primary intervention) or secondary intervention, as one of the intervention among the other therapies were also included. Studies other than case reports such as clinical trials, reviews, basic research or commentaries, books and magazine articles were excluded.

Data Extraction

For the final review, the full text of all the included studies were obtained, screened and the data was extracted on pre-specified data collection forms including the country, year, journal name and language of publication. Data on the time of publication, country of origin, age and gender of the case were also extracted including the disease studied in detail, procedure of nasya karma with the duration, dosage and the type of the *taila* (oil) used and data of the clinical outcomes etc. Conclusions of the studies and any associated adverse effects reported by the author were also addressed. Year of publication, number of cases, country of origin, age and gender of the case, disease studied in detail, procedure of nasya karma with the duration, dosage and the type of the *taila* (oil) used, data of the clinical outcomes of the cases, conclusions and any presence of adverse effects were recorded in case series.

Data synthesis and Subgroup Analysis

The present review evaluated only the qualitative analysis with no subgroup analysis with the results summarized in a tabular form.

RESULTS

Literature search

This review presents the flowchart of the included and excluded studies in Figure 1 (PRISMA Flowchart). The literature search revealed a total 963 studies among which 929 were non-duplicate studies and 815 studies were excluded because they did not include nasya karma as the intervention, but had just cited about nasya karma in the text. They were not case reports or case series. Among the studies assessed for eligibility (114), 109 were excluded because they were neither related to apabahuka nor frozen shoulder. It also comprised duplication of studies. Finally 5 unique case studies or reports were included for the review as no case series were available.

Overview

Table 2 depicts the characteristics of the included case reports. Of the included five case reports, four originated from India [25, 26, 27, 29] and 1 from Srilanka [28] (Figure 2). The first included case report was published in 2015 and then the reports were gradually increased every year. No case series were available on the domain studied. In the included 5 case studies on Apabahuka or the frozen shoulder, 5 patients each presenting with the complaints of Apabahuka or the frozen shoulder were involved. Among them, 3 were females and 2 males aged between 48yrs to 61yrs. Left shoulder joint was affected in three patients [27,26, 29] and right shoulder joint in two [25, 28]. All the five patients presented with pain, stiffness and restriction of movements in the shoulder joint. Associated complaints with pain in the neck and radiating pain to the arm and elbow joint were observed in two studies [25, 28]. The duration of the complaints was three months in two studies, [26,27] four months in two [25, 29], and five months in one study

[28]. Only one study [25] obtained the history of fall before the onset of symptoms, précised occupation [29] of the female patient as the housewife and one study [25] specified about co-morbidities in which one more reported hypertension with the habit of smoking [25].

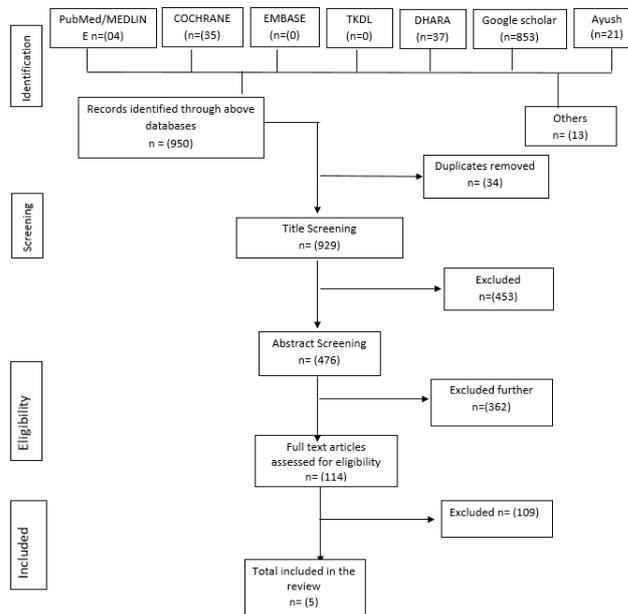


Figure 1: PRISMA

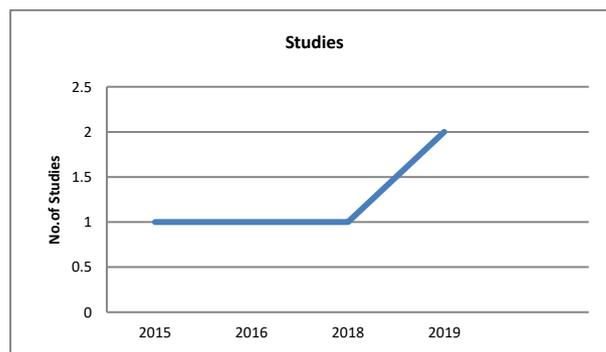


Figure 2: Year wise publications of studies

With the detailed history of the patients included in these 5 case reports, they were also examined for knee jerk, ankle jerk, biceps and triceps jerk, muscle power grade, shoulder joint specific tests like Empty can test (Jobe test), drop arm test (codman's sign) [27], Apley scratch test [25], Drop arm test and Alpey's and coracoids pain test [24]. Before starting the treatment, all the cases were advised for blood investigations and the X-ray (AP and lateral views) of the shoulder joint was obtained to assess the severity of the frozen shoulder.

Both the subjective and objective parameters were assessed in all the studies which comprised *bahu shoola* (pain in the shouder joint) both the duration and severity of pain, VAS, *bahu stambha* (stiffness), *bahu praspanditahara* (restriction of movements), ROM such as flexion, extension, abduction, adduction, internal rotation, external rotation forward elevation, lateral elevation, *amsa sosha* (muscle wasting), swelling, activities of daily living and power.

Pain was assessed in all the five studies, but two studies [26, 27] evaluated pain in detail with the duration and severity of pain including

VAS (Visual analog scale). Duration (nil pain to pain more than 12hrs/day) and severity of pain (no pain to severe pain) was assessed by grading it from 0 to 4, and also with VAS (visual analogue scale), a scale between 0-10 (no pain to severe pain). In these studies, the duration of pain which was 4 had reduced to 1 after the treatment and to 0 on follow-up. Whereas, severity of the pain reduced from grade 4 to 1 after the treatment and 0 with follow up and VAS scale showed reduction from the pain (grade 3 - grade 0) both after the treatment and on follow up. One study [28] assessed pain by grading between 0-3 and showed significant reduction in the pain, in which the pain score which was 3 before the treatment reduced to 0 at the end of treatment. Swapnil *et al* [25] evaluated pain in the constant assessment scale of shoulder as one among the other components and showed reduction in pain. Sanjay *et al* [29] just assessed pain before and after the treatment with reduction in pain.

Only 2 studies [28, 29] assessed for shoulder joint stiffness (*bahu stambha*), where Sanjay *et al* [28] just evaluated stiffness before and after treatment without any grading but Jayakody *et al* [27] graded even the stiffness from 0 to 3. In Jayakody *et al*. the shoulder joint stiffness which was 3 before the treatment was reduced to 1 at the end of treatment with significant changes showing reduction in the stiffness. But in Sanjay *et al*, no grading was done and this study too showed the significant reduction in the stiffness of shoulder joint.

Bahu prasanditahara (restricted movements) was assessed in 2 studies in which one [29] has just evaluated before and after treatment without any grading but showed improvement in the movements and the other [28] graded even the restricted movements of shoulder joint from 0 to 3 and showed improvement in the movements of shoulder joint.

Range of movements (ROM) was evaluated in maximum of 3 studies among which Krishnaprabha *et al* [26] and Deshpande *et al* [27] assessed flexion, extension, abduction, adduction, internal rotation and external rotation of the shoulder joint using goniometer before and after the treatment with marked improvements in all the ranges. Swapnil *et al* [25] too evaluated the internal rotation, external rotation, forward elevation and lateral elevation under the constant assessment scale of shoulder joint showing improvements in the movements of shoulder joint after the treatment. (Table 2)

Amsa sosha (muscle wasting) was evaluated by measuring the circumference of mid arm, elbow and cervical region in centimeters before and after the treatment as one of the objective parameter in 2 studies (Krishnaprabha *et al*, Deshpande *et al*) which showed significant improvement with the nasya karma. (Table 2)

In one study [24] the constant shoulder assessment scale [30] was evaluated which included 5 components such as pain, activities of daily living, forward and lateral elevation, internal rotation, external rotation and power. Pain was graded from no pain to mild, moderate and severe with maximum scoring of 15, ADL (activities of daily living) incorporated full work, full recreation or sport, unaffected sleep and positioning of the waist, xiphoid, neck and the top of the head. Both forward and lateral elevation was assessed in degrees from 0-180 with maximum scoring of 20. Both external and internal rotations were assessed with maximum scoring of 10 and power was evaluated by making the patient lift weight in the scapular plane. Scoring of this

scale was 15 at the baseline 36 after seven days after treatment and at the end of one month treatment it was 69. At seven days of therapy, there was 21% improvement in shoulder function and this relative improvement was sustained at the one month assessment i.e. 54%.

Management in Ayurveda comprises both the shodhana and shamana chikitsa with the aim of prevention and alleviation of the disease. Shodhana is executed through the panchakarma therapies, which forms the most integral part of the Ayurveda system of medicine. Nasya karma occupies one of the prime positions among the panchakarma therapies which portray a unique approach of management in the jatuurdhwagata rogas. This procedure is executed with the poorva, pradhana and the paschat karmas in a systematic manner. In the present review, 4 studies have administered both the shodhana and the shamana chikitsa for the patients suffering from apabahuka. Shodhana chikitsa included the nasya karma that was performed methodically with the poorva, pradhana and the paschat karma. Poorva karma was initiated with sthanika snehana or abhyanga (local massage) and the swedana (local fomentation), pradhana karma with the nasya karma followed by shamanaushadhi (oral medications) in the paschat karma.

In Sanjay *et al*, [29] *sthanika snehana* was administered with the *mahanarayana taila* and *swedana* with *jambira pottali* for 10 days. Jayakody *et al* [28] performed *abhyanga* (massage) with *kubja prasarini taila* and *sankara sweda* with *nikadu potali*, (a Srilankan polyherbal formulation) followed by *patra pottali pinda sweda*. Skandha basti with *mahavishagarbha taila* was given for 20 minutes in Swapnil *et al*. Before the *snehana* and *swedana*, 2 studies obtained the informed consent from the patient and also initiated the management with *deepana pachana*, in which *vaishwanara choorna* was given in the dose of 5gms with hot water, twice a day for 3 days (Deshpande *et al*) and *trikatu choorna* of 5gms twice daily with hot water for 3 days (Krishnaprabha *et al*).

In *pradhana karma* (main intervention), *nasya karma* was performed for 7 days in 3 studies (Deshpande *et al*, Jayakody *et al* and Swapnil *et al*), 16 days in one study (Krishnaprabha *et al*) and 10 days in the other (Sanjay *et al*) either during morning, evening or both with the dose of 8 drops in two studies (Deshpande *et al*, Krishnaprabha *et al*), 3 drops (Jayakody *et al*) in one study and not specified in 2 studies (Sanjay *et al* and Swapnil *et al*) followed with the *paschat karma*. With respect to the essential part of the *nasya karma*, the medicated *taila* or oil used, 2 studies used *karpasasthyadi taila* (Deshpande *et al*, Krishnaprabha *et al*) for the procedure, *panchendriya vardhana taila* (Sanjay *et al*), *shadbindu taila* (Jayakody *et al*) and *mashadi taila* by (Swapnil *et al*).

Along with the nasya karma, few studies executed additional therapies like Agnikarma chikitsa over the shoulder joint for three sittings with a gap not specified, but is normally executed with a gap of 7 days. (Sanjay *et al*), Application of Gaslabu Dilabu pattu (A Srilankan polyherbal formulation - an herbal paste prepared by mixing water with 250gms of the powder) over the shoulder and greevabasti with *kubjaprasarini taila* (300ml) for 7 days (Jayakody *et al*). One more study incorporated both the nasya karma of Ayurveda and Modern physiotherapy to evaluate the effect of integration like heat therapy, pulley exercise and wheel exercise. (Krishnaprabha *et al*). Only few studies directed the patients to begin with the *shamanaushadhi* or the oral medications. (Table 3)

DISCUSSION

The aim of a systematic review is to identify all the related studies focusing on a specific question extracted from research and other sources, to evaluate the study methods, interpretation of results, presentation of significance findings, exploring the logic behind different results across studies, and delineating the limitations of current knowledge [31, 32]. Ideally, a systematic review would be able to report cost measures as an outcome, as well as the potential adverse effects of an intervention [33].

More and more numbers of case reports have been published over the past several years, approximately 160 of new peer-reviewed journals have emerged that focus on publishing case reports. Most of these journals have high acceptance rates and are openly-accessible [34]. In the study of packer *et al*, it has been reported that case reports have rate of 6% publication [35]. These case reports are not frequently as they do not rank high in the hierarchy of research evidence. They are seldom published by high-impact medical journals due to its presentation of a single case study. But contribute in advancing the medical knowledge and one among the levels of research evidence they are proposed to have significant educational value [36].

Frozen shoulder is a condition that greatly disturbs the daily activities of the individual with severe pain and stiffness in the shoulder joint. Ayurvedic system of medicine speaks about apabahuka that can be correlated to frozen shoulder based on its features and has a specific line of management described in Ayurvedic classics [37]. While classifying the diseases our Acharyas have opined about vatavyadhis as a very important entity under which the ashta mahagadas (eight major diseases) are included and Apabahuka is one amongst them [38], that hampers most of the functions of hand.

This systematic review encompassed 5 unique cases of Apabahuka or the frozen shoulder which was seen in the patients aged from 48yrs to 61yrs. All these studies assessed bahu shoola (pain in the shoulder joint) with the duration and severity of pain, VAS (visual analogue scale), Bahu stambha (stiffness), Bahu prasanditahara (restriction of movements), Range of Movements (ROM) such as flexion, extension, abduction, adduction, internal rotation and external rotation, Amsa sosha (muscle wasting), swelling, activities of daily living, forward elevation, lateral elevation and power and the constant shoulder assessment scale. All the outcome measures were assessed before and after the treatment.

Shodhana is considered as one of the vital and the most important process through which the increased doshas are eliminated from the body. The process that helps the biological system of the body by bringing back into normalcy the impaired doshas is known as bio-purification. This simultaneously rejuvenates the pharmacokinetic effect of therapeutic remedies after administration. This detoxification procedure helps in maximizing the absorption and metabolism of nutrients and drugs, minimizes the dose and toxicity and primarily eliminates toxins, metabolites of the body, stagnated excreta and cleanses the macro and micro channels [39].

Before performing Panchakarma (shodhana), in purva karma, first Snehana, then Svedana Karma should be carried out and later it should be followed by any samshodhana [40]. Purva karma is the pre-karma or

the foundation of panchakarma shodhana which mobilizes the vitiated doshas and are expelled from the body without causing any harm to it [39]. Dipana-Pachana is the basis of panchakarma and its importance lies in bringing the doshas to niramavastha from samavastha. Hence dipana-pachana is administered prior to the snehana therapy based on the conditions. The drugs used for Deepana Pachana increases the Agni and helps in the digestion of Ama. It might lead to sanjanasha and also the death, if the Snehana therapy is administered in Amavastha [40]. In the current review, 2 studies obtained the informed consent from the patient and also initiated the management with deepana pachana, in which vaishwanara choorna was given in the dose of 5gms with hot water, twice a day for 3 days (Deshpande *et al*) and trikatu choorna of 5gms twice daily with hot water for 3 days (Krishnaprabha *et al*).

During the procedure of Nasya karma, the preoperative and the post operative procedures play a very important role wherein, the preoperative procedures helps in ingress of the drug into the body. It includes steps such as the lowering of the head, elevation of lower extremities and fomentation of face that enhances the blood circulation of the head and face [41]. The sthanika abhyanga as per the Modern medicine increases the blood circulation which mobilizes and leads to Mriduta of Doshas according to Ayurvedic science. The next step is Swedana that helps in liquefaction or the vilayana of the doshas that are accumulated. Lowering of head helps in retaining the instilled medicine in the nose and thus increasing the contact time with mucosa. The pre and post operative procedures of nasya karma help in the proper drug absorption and transportation [42].

In this study of Sanjay *et al*, sthanika snehana was administered with the mahararavana taila and swedana with jambira pottali for 10 days. Jayakody *et al* performed abhyanga (massage) with kubja prasarini taila and sankara sweda with nikadu potali, (a Srilankan polyherbal formulation) followed by patra pottali pinda sweda. Skandha basti with mahavishagarbha taila was given for 20 minutes in Swapnil *et al*. In the panchakarma procedure, pre and post karmas has particular role to play where these helps in facilitating the pradhana karma in an efficient and a smoother way by developing body sensitivity and by maintaining the balance throughout the entire process. Administration of the pradhana karma without the pre-procedures leads to complications [39]. By the purva karma the doshas are mobilized from sakha (Periphery) to koshta (GIT) and are evacuated from their nearest route of excretion. This mobilization of doshas (Bio-humor) is accomplished with the blend of both Snehana (Oleation) and Swedana (Sudation). From the initial purva karma to paschat karma including pradhana karma it involves the evacuation of morbid and vitiated doshas, elimination of ama dosha (toxins) from the body with positive and stable response [39].

Either applied as a single or in a collective manner based on different situations, the pradhana karma discharges the impure material called as "Ama Doshas" from their accumulation sites. As these procedures eliminate the ama doshas, these are called as Shodhana Karma and is indicated in the stages of prakopa or the stage of excess aggravation of doshas (Bio-humors) [39]. In the present review, pradhana karma (main intervention), nasya karma (Elimination of toxins through the nose/errhine therapy) was performed for 7 days in 3 studies (Deshpande *et al*, Jayakody *et al* and Swapnil *et al*), 16 days in one study (Krishnaprabha *et al*) and 10 days in one study (Sanjay *et al*)

either during morning, evening or both. With respect to the number of days, acharyas have given a diverse opinion; Sushruta (1,2,7,21) days, Vagbhata (3,5,7,8) days, Bhoja 9 days and according to Vagbhata, seven consecutive days.

As per the Ayurveda Acharyas, Nasya karma should be administered for three days, five days, seven days and eight 8 days or till the patient exhibit the symptoms of Samyak Nasya lakshanas that is enlisted in Ashtanga Samgraha. As per Bhoja acharya if the same nasya is continued beyond nine days then it gets satmya (adaptable) to patient. Further administration after nine days neither provides benefits nor does harm. Acharya Charaka has advised to administer the nasya karma based on the severity of disease and but not stated the duration [40].

Concerning the quantity of the dravya (material) or the taila used in the nasya karma, bindupramāna is elucidated in Ayurveda texts, where bindu is the unit of measurement and defined as the net quantity of drava that dribbles down when the first two parts of index finger are immersed in the liquid [43]. Thus one bindu will be 0.5ml and therefore quantity of aṇutaila will be 48 bindus i.e. 24ml, which is almost identical to the quantity of 25 ml described in contemporary medicine [44]. Different quantities of nasya that are mentioned by the Ayurvedic scholars' needs to be standardized by conducting more research. Taila in the nasya karma were used in the dose of 8 drops in two studies (Deshpande *et al*, Krishnaprabha *et al*), 3 drops (Jayakody *et al*) in one study and not specified in 2 studies (Sanjay *et al* and Swapnil *et al*) followed with the paschat karma in this review.

Regarding the time of administration of nasya karma it should be administered during morning in sharad and vasanta, afternoon sheetakala, evening in greeshma and on empty stomach and during the sun in varsha rutu, and because administration of the procedure after the food leads to chardi, shwasa, kāsa and pratishyaya as doshas envelops the urdhwa srotas [40]. Position of the patients matters a lot during instillation of the nasya dravya. Head low position with slight elevation of the legs helps in medicine to reach deep inside olfactory mucosa and facilitates absorption [45]. The same technique was followed in all the studies of the present review.

Once the Shodhana karma is done, the patient experiences the weakness of the digestive fire (Agni) & strength of body. In order to restore these, the special dietetic regimen is advised to follow. This post regimen or the paschat karma includes the samsarjana krama, pathya or the diet with Dhumapana, Kavalgraha and Gandusha etc post therapeutic measures [39]. Further, administration of the slight urdhvanga massage with swedana, dhoompana and kavalagraha post nasya karma helps to drain out the residual utklishta doshas (remnants) and also increases the efficacy of the treatment [42].

The irritation of somatic constriction caused due to heat stimulation is relieved by post nasya karma procedures such as application of mild massage over the frontal, temporal, maxillary, mastoid and on manya and also in removing the slush created in these regions. Manya or the neck region is a Marma and pressure applied on these makes the barro-receptors bring the de-arranged cerebral arterial pressure to normalcy, as these receptors lying on bed of bifurcation of common carotid artery have a buffering action on the cerebral arterial pressure [46].

Shamana chikitsa is the treatment, which doesn't eliminate the Doshas but tries to bring equilibrium in the imbalanced doshas [39]. In the present review, only some of the studies directed the patients to begin with the shamanaushadhi or the oral medications which has been described under the intervention.

Regarding the treatment of supraclavicular diseases and local nasal disorders, nasya karma or the nasal route of drug administration is the first and natural choice. This involves non-invasive drug administration route with transmucosal nasal drug delivery. Being one among the detoxification therapies, this is a unique therapy as it aims at alleviation of the disorders that are related to head and neck region. According to Acharya Vagbhata nasa (nose) is the dwara (door) for Shiras and the drug administered through nose reaches the Shringataka Marma, where shringataka marma is a sira marma which is formed by the siras of nasa, akshi, jivha and shrotra. The drug administered disseminates through murdha, netra, shrotra and kantha through their siras thereby eliminating the morbid doshas of urdhwajatru vyadhis and expelling them from the Uttamanga. By this process the disorder is relieved [42]. In the present review, all the included case studies have shown significant changes in all the parameters with nasya karma indicating that nasya karma is effective in apabahuka or the frozen shoulder.

Though case reports and case series forms the lower level of evidence in research, they are studied and published to assess the effect of intervention on one subject and further with the clinical studies, comparative studies etc to evaluate on the larger sample or includes a case with unique presentation. These types of studies play a crucial role in providing an insight for the future studies.

Ours is the first systematic review concerning the nasya karma and apabahuka. The current systematic review was followed according to the guidelines of PRISMA which has been appraised as the standard reference for conducting Systematic reviews and Meta analysis [24]. This review underwent a thorough comprehensive search for eligible studies from the databases such as PubMed, Cochrane, EMBASE, Google scholar TKDL, AYUSH and DHARA. These were screened from the inception until March 8th, 2020. The search strategy, inclusion criteria and final results of the assessment have been represented in tables and graphs so that the researchers may extract the necessary information for their further studies. 5 case reports and 0 case series were included for the final review. All the 5 studies in this review administered nasya karma to the patients suffering from apabahuka or frozen shoulder and assessed pain, VAS (visual analogue scale), stiffness, ROM (Range of movements), restricted movements and constant assessment scale of shoulder joint before and after the treatment which showed significant improvement in all the parameters.

As the included studies are case studies, the evidence level may be low. Only case reports that were published in peer reviewed journals were included to ensure a certain quality of assessment and reporting and we acknowledge the limitations of this review. Besides the quality of reporting which was generally low in the included case reports, it gives an inclination of a novice idea to the researchers regarding the evaluation, intervention and the outcomes of the studies to further proceed with RCTs, clinical studies etc with a larger sample and a longer follow up. This review may assist the researcher as a

supplementary by giving an intuition for the studies to be conducted further. With this ideology, the present review was planned and conducted with a comprehensive elaboration of the studies included for the review.

Adverse events

None of the included studies observed the adverse events either during or after the completion of treatment.

CONCLUSIONS

Nasya karma, one of the panchakarma therapies in Ayurvedic system of medicine constitutes the main treatment in the management of jatru-urhdhwagata rogas mainly apabahuka or the frozen shoulder. Though present review showed significant changes in all the parameters with several limitations besides the quality of reporting, that is generally low in the included case reports, this review provides a comprehensive knowledge that may assist the researcher as a supplementary by giving an intuition for the execution of RCT's and clinical studies further on the domain studied. Having negligible number of systematic reviews in Ayurveda and absence of systematic reviews on case studies or reports and series, this review may serve as a preliminary step towards conducting more systematic reviews in Ayurvedic system of medicine which is need of the hour. Nasya karma can be administered to the patients of apabahuka even with the comorbidities like diabetes and others. This is considered as a safe, affordable therapy with significant changes in clinical outcomes and without any adverse events.

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Conflict of Interest

None declared.

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REFERENCES

1. Dooley LM. Case study research and theory building. *Adv Develop Hum Resour.* 2002; 4:335–354. <http://journals.sagepub.com/doi/pdf/10.1177/1523422302043007>
2. Sayre JW, Toklu HZ, Ye F, Mazza J, Yale S. Case Reports, Case Series - From Clinical Practice to Evidence-Based Medicine in Graduate Medical Education. *Cureus*, 2017; 9(8):e1546. <https://doi.org/10.7759/cureus.1546>
3. Zuckerman JD, Rokito A. Frozen shoulder: a consensus definition. *J Shoulder Elbow Surg.* 2011; 20:322–5.
4. Manske RC, Prohaska D. Diagnosis and management of adhesive capsulitis. *Curr Rev Musculoskelet Med.* 2008; 1:180–189.
5. Robinson CM, Seah KT, Chee YH, Hindle P, Murray IR. Frozen shoulder. *J Bone Joint Surg Br.* 2012; 94:1–9.
6. Uppal HS, Evans JP, Smith C. Frozen shoulder: A systematic review of therapeutic options. *World journal of orthopedics*, 2015; 6(2):263–268. <https://doi.org/10.5312/wjo.v6.i2.263>
7. Smith CD, Hamer P, Bunker TD. Arthroscopic capsular release for idiopathic frozen shoulder with intra-articular injection and a controlled manipulation. *Ann R Coll Surg Engl.* 2014; 96(1):55–60.
8. Brue S, Valentin A, Forssblad M, Werner S, Mikkelsen C, Cerulli G. Idiopathic adhesive capsulitis of the shoulder: a review. *Knee Surg Sports Traumatol Arthrosc.* 2007; 15:1048–54.
9. Reeves B. The natural history of the frozen shoulder syndrome. *Scand J Rheumatol* 1976; 4:193–6.
10. Dias R, Cutts S, Massoud S. Frozen shoulder. *BMJ (Clinical research ed.)*, 2005; 331(7530):1453–1456. <https://doi.org/10.1136/bmj.331.7530.1453>
11. Schultheis A, Reichwein F, Nebelung W. Frozen shoulder. Diagnosis and therapy. *Orthopade* 2008; 37:1065–72.
12. Sheridan MA, Hannafin JA. Upper extremity: emphasis on frozen shoulder. *Orthop Clin North Am* 2006; 37:531–9.
13. Lewis J. Frozen shoulder contracture syndrome - aetiology, diagnosis and management. *Man Ther* 2015; 20:2–9.
14. Cui J, Lu W, He Y, et al. Molecular biology of frozen shoulder-induced limitation of shoulder joint movements. *J Res Med Sci* 2017; 22:61.
15. Eljabu W, Klinger HM, von Knoch M. Prognostic factors and therapeutic options for treatment of frozen shoulder: a systematic review. *Arch Orthop Trauma Surg* 2016; 136:1–7.
16. Ryan V, Brown H, Minns Lowe CJ, et al. The pathophysiology associated with primary (idiopathic) frozen shoulder: a systematic review. *BMC Musculoskelet Disord* 2016; 17:340.
17. Martin J. Kelley, PT, DPT, OCS Phillip W. McClure, PT, PhD Brian G. Leggin, PT, DPT, OCS. Frozen Shoulder: Evidence and a Proposed Model Guiding Rehabilitation. *Journal of Orthopaedic & Sports Physical Therapy.* 2009; 39(2):135-148.
18. Cui J, Lu W, He Y, et al. Molecular biology of frozen shoulder-induced limitation of shoulder joint movements. *J Res Med Sci* 2017; 22:61.
19. Patwardhan B. Bridging Ayurveda with evidence-based scientific approaches in medicine. *The EPMA journal*, 2014; 5(1):19. <https://doi.org/10.1186/1878-5085-5-19>
20. Wujastyk D, Smith FM. *Modern and global Ayurveda: pluralism and paradigms.* Albany, USA: SUNY Press; 2013.
21. Ramteke RS, Patil PD, Thakar AB. Efficacy of Nasya (nasal medication) in coma: A case study. *Ancient science of life*, 2016; 35(4):232–235. <https://doi.org/10.4103/0257-7941.188188>
22. Patil, Vaidya Vasant & uppin, chennamma & gupta, sanjay & hiremath, veerayya & rayanagoudar, s.v. & kendadamath, d.b.. (2016). Clinical study to compare the efficacy of nasya karma with shigru taila and vidangadya taila in vataja pratishyaya (allergic rhinitis). *AYUSHDHARA- An International Journal of Research in AYUSH and Allied Systems.* 3. 737-743.
23. Gopalakrishnan S, Ganeshkumar P. Systematic Reviews and Meta-analysis: Understanding the Best Evidence in Primary Healthcare. *Journal of family medicine and primary care*, 2013; 2(1):9–14. <https://doi.org/10.4103/2249-4863.109934>
24. Liberati A, Altman DG, Tetzlaff J, Mulrow C, G? tzsche PC, Ioannidis JP, Clarke M, Devereaux PJ, Kleijnen J, Moher D: The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *PLoS Med*, 2009, 6, e1000100.
25. Swapnil Swapnil S. Singhai. Frozen Shoulder (Adhesive Capsulitis) Literary Review and a Prospective Case Study with Panchakarma Therapy. *Int J Ayu Pharm Chem* 2015;(3)1:129-38.
26. Krishnaprabha A, Mishra R, Kumar KK. A case study on the ayurvedic management of apabahuka with karpasasthyadi taila nasya and physiotherapy. *Global J Res Med Plants Indigen Med* 2016; 5:137-45.
27. Deshpande Mahadevi, Chavan SG, ed Medical Sciences. <http://www.jaims.in/index.php/jaims/pages/view/Citation>. 2018; 3(2):125 - 130. ISSN 2456-3110.
28. Jayakody MIJ, Gunarathna EDTP, Kulathunge RDH. Management of Avabahuka (Frozen Shoulder) Through Sri Lankan Ayurveda Treatment

- Protocol: A Case Study. *Int. J. of AYUSH Case Reports* April - June 2019; 3(2).
29. Dr. Aditya Sanjaykumar Dalvi, Dr. Akshay Santosh Gandhi. "CASE STUDY- Management Of Avabahuka With Special Reference To Frozen Shoulder By Ayurvedic Medicine." *International Journal of Research - Granthaalayah*, 2019; 7(3):116-119. <https://doi.org/10.29121/granthaalayah.v7.i3.2019.950>.
 30. Constant CR, Murley AH. A clinical method of functional assessment of the shoulder. *Clin Orthop* 1987; 214:160-4.
 31. Cook DJ, Mulrow CD, Haynes RB: Systematic reviews: Synthesis of best evidence for clinical decisions. *Ann Intern Med* 1997; 126:376-380.
 32. Oxman AD, Cook DJ, Guyatt GH: Users' guides to the medical literature. VI. How to use an overview. Evidence-Based Medicine Working Group. *JAMA* 1994; 272:1367-1371.
 33. McNamara ER, Scales CD Jr. Role of systematic reviews and meta-analysis in evidence-based clinical practice. *Indian journal of urology: IJU: journal of the Urological Society of India*. 2011; 27(4):520–524. <https://doi.org/10.4103/0970-1591.91445>.
 34. New journals for publishing medical case reports. Akers KG. *J Med Libr Assoc*. 2016; 104:146–149. [PMC free article] [PubMed] [Google Scholar]
 35. Packer CD, Katz RB, Iacopetti CL, *et al*. A case suspended in time: the educational value of case reports. *Acad Med*. 2017; 92:152–156. [PubMed] [Google Scholar]
 36. Sayre JW, Toklu HZ, Ye F, Mazza J, Yale S. Case Reports, Case Series - From Clinical Practice to Evidence-Based Medicine in Graduate Medical Education. *Cureus*, 2017; 9(8), e1546. <https://doi.org/10.7759/cureus.1546>
 37. Agnivesha Charaka Samhita. Redacted by Charaka and Dridbala, with Ayurveda Deepika commentary by Chakrapani Datta. Yadhavji Trikamji, Fourth edition, Chaukhamba Orientalia, Varanasi, 2011, 396.
 38. Jangir V. A Comparative Study of Swalpa Masha Taila Nasya and Swalpa Masha Taila Uttarabaktika Snehapana in the Management of an Avabahuka. *International Journal of Advance Research, Ideas and Innovations in Technology*. 2017.
 39. Kumar D, Patel MK, Thorawat VK. Review & Introduction of Panchakarma. *International Research Journal of Interdisciplinary & Multidisciplinary Studies (IRJIMS)*. 2017; 2(XII):09-16.
 40. Shruthi S, Swati S. Despande, Vinay Kumar K N. Consideration of kala in panchakarma. *Int. J. of Pharmacy and Analytical Research*. 2017;6(3):589-596.
 41. Asutkar *et al*. 2016 Greentree Group © IJAPC 2015 Greentree Group © IJAPC Int J Ayu Pharm Chem 2015 Vol. 4 Issue 2
 42. Vipin Kumar. A Conceptual Study on Mode of Action of Nasya. *International Journal of Ayurveda and Pharma Research*. 2017; 5(7):100-102.
 43. Viraj M. Manerikar *et al*: Review on Pharmacodynamics of Nasya. *IAMJ: Volume 3; Issue 6; June- 2015*.
 44. Cakrl PR, Nimates NK, Kamino AP. Effect of physicochemical properties on nasal drug delivery. *Advanced drug delivery Reviews*. 1998; 98-116.
 45. Anura P Bale, Viraj M. Manerikar, Vaishnavi G. Tengse. Review on Pharmacodynamics of Nasya. *IAMJ: Volume 3; Issue 6; June- 2015*
 46. Chopra C, Bhardwaj V, Katna L, Kumar N. Concept of Nasya According To Ayurvedic And Modern Science. *WJPMR*. 2018;4(9):148-154.

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