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Effect of nasal septal mobilization on chronic sinusitis patients: A pilot study

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Abstract
Purpose: The study was conducted to identify the therapeutic effect of the nasal septal mobilization technique for the relief in symptoms of chronic sinusitis patients. This paper aims to determine the effectiveness of the nasal septal mobilization technique with respect to short term and long-term symptoms.
Objective: To observe the effect of nasal septal mobilization on relieving the symptoms of chronic sinusitis within the span of 2 months.
Method: Subjects were selected on the basis of the inclusion and exclusion criteria. After taking an informed consent from each subject, they were explained the procedure of the technique and the measurement of the symptoms, on the visual analogue scale (VAS) and the chronic sinusitis survey (CSS), was taught.
Study design: The study design is a pilot experiment.
Result: The study showed significant effect in immediate relief post nasal septal mobilization represented on VAS with $p < 0.05$. The p value of the data from the chronic sinusitis survey pre was calculated and the p value came out to be 0.09(>0.005), which suggests there was statistically insignificant effect of the technique on the recurrence of symptoms and need of use of medicines.
Conclusion: This study concludes that nasal septal mobilization provides immediate pain relief in chronic sinusitis patients, although shows insignificant effect on the recurrence and need of use of medicines.

Keywords: chronic sinusitis, nasal septal mobilization, chronic sinusitis survey

1. Introduction

The paranasal sinuses are air filled spaces surrounding nasal cavity and these cavities are found in the interior of maxilla, frontal, sphenoid and ethmoid bones of the facial bones [1]. Respectively there are four paranasal sinuses: Maxillary, frontal sphenoid and ethmoid paranasal sinuses in those bones. They are lined by mucous cells that produce mucous and has cilia which helps movement of mucous into the nasal cavity through small apertures. The mucus produced by these glands in the mucus membranes is moved into the nose by ciliary action of the columnar cells. Sinuses are lined with mucoperiosteal cells and filled with air; they communicate with the nasal cavity through relatively small apertures. The function of the sinuses is to act as resonators to the voice; they also reduce the weight of the skull other than the primary mucociliary function [2].

Sinusitis is a major health problem where the lining of the paranasal sinuses becomes inflamed. Acute sinusitis lasts up to 4 weeks and presents frequently with persistence of symptoms after common cold has subsided, with nasal congestion, mucopurulent or purulent nasal discharge, headache, facial pain or heaviness and fever. In chronic sinusitis, pain and fever seldom present and nasal obstruction, purulent nasal discharge, postnatal drip, chronic cough, hyposmia halitosis, are the predominant symptoms [3] and chronic sinusitis lasts atleast for several weeks and linger for years. It might start because of cold or allergies but most chronic sinusitis is due to problems with the structure of the nasal passages or nasal polyps that keeps the sinuses from draining normally [4].

Nasal septal mobilization is a technique described by Dr. Alan Mandell in one of his videos that he posted on internet stating that lack of motion causes lack of function. Thus, via nasal septal mobilization he wants to facilitate function by facilitating motion and also stimulating the nerve endings within the sinus canal to stimulate sinus drainage [5].

Anatomical variations are seen including pneumatization of the middle turbinate, paradoxical curvature of the middle turbinate and haller cells pneumatization of the uncinate process [6]. Amongst the 60% of the sinusitis affected people in a general population, 40 % of the patients had maxillary sinuses involved [7]. The maxillary sinus is prone to sinusitis its drainage orifice through the hiatus semilunaris is badly placed near the roof of the sinus. Since has to fill up with fluid before it can effectively drain with the person in upright position.

There is hardly any physiotherapy related technique focuses on sinusitis management other than vibration of sinuses technique of facial massage [8] and possibly drainage facilitation by kinesiotaping method, although not very popularly used for management of chronic sinusitis. Most affected sinus is maxillary sinus as its drainage orifice through the hiatus semilunaris is badly placed near the roof of the sinus [2]. There are hardly any research done on nasal septum mobilization technique and its effectiveness.

2. Materials and Methods

Materials

Consent form
Pen
Chronic sinusitis survey
Visual analogue scale

Method

1. Study design: Pilot study
2. Study type: Descriptive
3. Sample size: 10
4. Sampling method: Convenient method
5. Study population: Patients of chronic sinusitis.
6. Study setting: ENT Clinics in and around pune.
7. Duration of study: minimum 4 months.
8. Treatment duration: 2 months.

2.1 Inclusion and Exclusion criteria

2.1.1 Inclusion criteria

Diagnosed case of chronic sinusitis for more than 2 months with or without consumptions of medication of chronic sinusitis [10]

2.1.2 Exclusion criteria

Local contraindications for face mobilization or massage. (abrasions, skin conditions, broken bones)

Medical contraindications. (bacterial infections, conjuctivitis, styes)

Duration of onset less than 2 months

Headache due to reasons other than chronic sinusitis (TMJD, cervicogenic headache, underlying neurological diseases, anxiety related, etc)

Patients with surgery performed in past 1 year for sinusitis [6]

Cognition level impairments.

2.2 Outcome Measures

2.2.1Chronic sinusitis survey [9]

The Chronic Sinusitis Survey is a 6-item duration-based monitor of sinusitis outcomes that has demonstrated statistical reliability and validity. It is divided into symptoms-based section and medications-based section. The symptoms-based section asks questions about the duration of symptoms during a 2 months period. The symptoms assessed are sinus headaches, facial pain or pressure, nasal drainage or postnasal drip, and nasal congestion or obstruction. The medications-based section assesses usage of anti biotoic, prescription nasal sprays, and over the counter sinus medications. The six components of the survey is divided into four section: symptoms of sinusitis, need of use of medicines, the third section asks who filled the survey and the last one asks for history of surgery in past one year. The CSS is a very sensitive to clinicsl change over time, which makes it particular valuable tool to assess patients with chronic sinusitis during the course of study [9]. The test reliability ranged 0.82-0.92 and the internal consistency reliability ranged 0.31-0.55 [10]

2.2.2 Visual Analogue Scale for headache

It consists of a line of 10 cm in length with the left extremity indicating 'no pain' and the right end indicating unbearable pain. Participants will be asked to mark their level of the pain accordingly. Wherever the subject marks their pain, it can be measured later by a scale to know the magnitude of the pain with reference to the minimum i.e 0 and the maximum i.e 10 scores. The reliability of this scale for chronic pain is moderate to good.

2.3 Procedure

Ethical clearance from the ethical committee of PES Modern College of Physiotherapy, Shivajinagar, Pune; was taken after presenting a power point presentation of the study and approval for the study procedure was be taken. When the patient with chronic sinusitis came and he or she met with the inclusion criteria and does not fulfil any exclusion criteria, he or she were included in the study. After explaining the procedure and aims of the study, if the patient agreed to go ahead with the intervention and co-operation for the study then a signed consent was taken on the consent form. Initially the chronic sinusitis survey form was explained, which was then asked by the subject to fill based on their symptoms of sinusitis experienced past 2 months. For measuring the magnitude of headache visual analogue scale was used and were asked by the subject to mark their approximate level of headache that was experienced due to sinusitis. The subject will be taught the nasal septal mobilization technique within one week of training period to ensure that they will be performing it with proper technique, minimizing any human error. For more assurance of correct application, subjects were provided with a video graphic guide.

Nasal septal mobilization steps

Begin with palpation of cheek bones i.e Zygomatic bone' palpated by its inferior border obliquely from the corner of the mouth using that thumb of the same side.

Proceed to palpate the nasal bridge at the lateral side of cartilaginous part, hand the lower third of the septum, using the index and middle finger of the opposite side.

After proper placement, stretch the thumb towards the corner of the eye and the opposite fingers towards that side of ear.

2.4. Data and Statistical analysis

2.4.1 Data from Visual analogue scale

The pre NSM and post NSM data of average values of VAS scores of all subjects and also the data from chronic sinusitis surveys of pre intervention and post intervention of the study were analysed using paired t test. Any value above 0.05 is considered significant and below 0.05 is not considered insignificant.

Table 1: Statistical analysis of data acquired from VAS outcome measure

Group	No. of Subjects	Mean Vas Score	Standard Deviation	SEM
PRE-NSM	10	6.83	0.6056	0.1915
POST-NSM	10	4.11	0.5607	0.1773
DIFFERENCE		2.72	0.3994	0.1263

95% Confidence Interval for Difference 2.434 TO 3.006, t =21.533 with 9 degrees of freedom p = 0.000

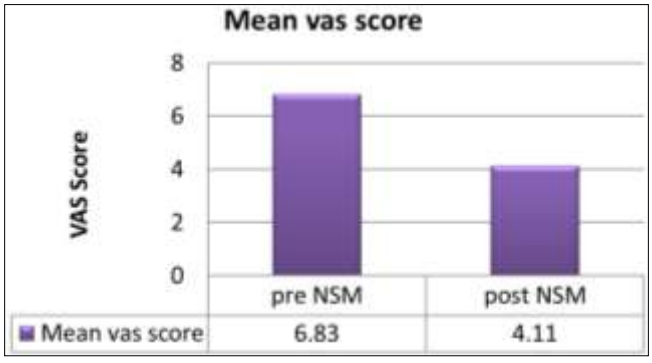

Fig 1

2.4.2 Data from chronic sinusitis survey
The p value of the data from the chronic sinusitis survey pre and post came out to be 0.09(>0.005), which suggests there was statistically insignificant effect on the recurrence and need of use of medicines.

2.5 Ethical issues
Entire process of this research project was done by following the guidelines of Maharashtra University of Health Science. Synopsis proposal including procedure and methodology was approved by the Ethical committee of PES Modern College of Physiotherapy at institution level. The safety of the participant was ensured by the researcher and strict confidentiality was maintained regarding patient information, their condition and the treatment.

2.6 Informed Consent
The researcher obtained informed consent from all the participants within the study. All the participants were explained about the nature of the assessment and the technique. They were given the liberty to quit being the part of the study at any time if they wish to, without having to give reason for doing so. Participants were free to ask any queries regarding their condition to the doctor.

3. Results
The data of pre NSM and post NSM was collected from 10 subjects to check the difference in pain and the mean value was 6.83 and 4.11 respectively which gave the difference of 2.72. After analysing the data through paired t test, the results were as follows: 95% Confidence interval for difference 2.434 TO 3.006, t =21.533 with 9 degrees of freedom p = 0.00. This suggested that there was a significant effect of nasal septal mobilization on immediate pain relief.
The chronic sinusitis survey data from pre and post study of 2 months of each subject had hardly any difference. The p value of the data from the chronic sinusitis survey pre was calculated and the p value came out to be 0.09(>0.005), which suggests there was statistically insignificant effect on the recurrence of the symptoms and need of use of medicines.

4. Discussion
The aim and objective of this study was to find the effect in both short and long terms of the technique 'nasal septal mobilization' on the pain felt due to sinusitis and on recurrence of other symptoms like nasal congestion, nasal drip, headache and also on the need of use of medicines in this condition.
Nasal septal mobilization is said to be working in such a way that it stimulates the nerve endings of the sinus thereby facilitating the motion of cilia inside sinuses and also reducing pain by instigating pain gate mechanism. It is a technique which is based on the principle that suggests facilitating motion of a particular system, facilitates its function therefore helps correcting the dysfunction possibly occurring in it due to any pathology.
In this research study, nasal septal mobilization was performed by the subject whenever the episode occurred and the immediate effect on pain was noted and the rest other aspects like effect on recurrence of symptoms and on need of use of medicines were observed for change pre and post study of 2 months course. The study results showed statistically significant results on immediate effect on pain reduction but did not have significant effect on recurrence and need of use of medicines as noted in the chronic sinusitis survey.
The possible reason for such results could be because the mobilizing must have stimulated the pain gate mechanism in an effective manner to cause reduction of pain immediately and the technique could have caused a stretch on the facial fascia and muscles present on that part of the face that could help giving a relaxing feeling. But the technique may not be as impactful as to create a long-term effect like preventing the recurrence of the episodes and reducing the need of use of medicines.

5. Limitations
The specificity of chronic sinusitis survey, that was used as an outcome measure in this study, was found to be poor. This was observed when, for instance, a subject having 4 episodes of nasal congestion and another subject having 12 episodes of the same marked the same '1-2 weeks' options and belonged in the same category. Another limitation of this study was found to be that it did not differentiate the pediatric and adult population which could have yielded different observations.

6. Future Scope
As this pilot study shows statistically significant results on pain, further studies can be done on a larger scale in order to improve the quality of a final study.

7. Conclusion
The Nasal septal mobilization for chronic sinusitis patients has shown significant results post intervention in reducing pain on VAS. (difference : 2.434 to 3.006)
The nasal septal mobilization for chronic sinusitis patients has statistically insignificant results on recurrence of sinusitis episodes and need of use of medicines.
Thus, this study concludes that nasal septal mobilization provides immediate pain relief in chronic sinusitis patients, although shows insignificant effect on the recurrence and need of use of medicines.

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