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Original Research Article

EFFECT OF NASAL PACKING WITH AIRWAY AND WITHOUT AIRWAY, ON PATIENT'S DISCOMFORT LEVELS AND QUALITY OF SLEEP IN THE IMMEDIATE POSTOPERATIVE PERIOD: A COMPARATIVE STUDY IN A TERTIARY CARE HOSPITAL IN SOUTH INDIA

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Abstract

Background: To quantify the discomfort levels and quality of sleep, experienced by the patients when anterior nasal packing was done using nasal pack with an integrated airway and without an integrated airway. **Materials and Methods:** It is a comparative study done at a tertiary level hospital in Madurai, Tamil Nadu between January 2023 to December 2023. A total of 70 patients undergoing nasal surgeries such as Septoplasty and FESS were enrolled for the study. Patients were randomly divided into two groups. For Group A patients, nasal packing was done with airway integrated nasal pack and for Group B nasal packing was done with nasal pack that did not have an airway integrated within it. Subjective assessment of nasal obstruction and difficulty in breathing was done using NOSE score on the first postoperative day. Postoperative pain was recorded using Visual analogue scale (VAS) at 1 hour, 6 hours and 24 hours after surgery. Quality of sleep was assessed using Sleep quality scale (SQS) on the night of the surgery. All the data were recorded in Microsoft Excel and analysed using Statistical Package for Social Sciences (SPSS) software version 22. **Result:** A total of 70 patients were recruited for the study. In Group-A (Airway integrated nasal pack) 42.8% patients reported severe nasal obstruction compared to 60% in Group-B (nasal pack without airway). Similarly, 37.1% in Group-A reported severe difficulty in breathing compared to 62.9% in Group-B. Group A patients reported a postoperative pain mean score of 8, 5.4 and 4.6 at 1 hour, 6 hours and 24 hours respectively. Whereas group B patients reported mean scores of 8.3, 7.4 and 7.1 at the same intervals. The quality of sleep mean score in Group A was 7.4 and 4.9 in group B. **Conclusion:** Patients who received nasal pack with an integrated airway had less discomfort and better quality of sleep than the patients who received nasal packs without an integrated airway for anterior nasal packing following nasal surgery.

INTRODUCTION

Anterior nasal packing is a routine procedure following nasal surgeries like septoplasty and FESS for achieving haemostasis and for mechanical splinting. However, it is associated with significant discomfort for the patients especially in the immediate post operative period. Most patients complaint of nasal obstruction, difficulty in breathing, headache, ear block, ear ache and sleep disturbance.[1]

The aim of this study was to quantify the discomfort levels and quality of sleep, experienced by the patients related to anterior nasal packing in the immediate post operative period and compare the same variables when nasal packing was done using nasal pack with an integrated airway and without an integrated airway.

MATERIALS AND METHODS

A total of 70 patients undergoing nasal surgery as Septoplasty and Functional endoscopic sinus surgery due to deviated nasal septum and chronic sinusitis respectively were enrolled for the study. The study included patients between the age group of 20 to 60 years. Patients with diagnosed vascular headache and anxiety disorder were excluded. Patients in whom nasal packing was done for control of epistaxis and in whom sinus surgery was done for other causes like invasive fungal sinusitis or for malignant conditions were also excluded. Informed written consent was obtained from all the patients included in the study. Institutional ethics committee approval was obtained. Patients were randomly divided in to two groups (Group A and Group B) of 35 patients each. For patients in Group A nasal packing was done with airway integrated nasal pack and Group B was packed with regular nasal pack which did not have any airway integrated within it (Figure 1). Both nasal packs were non absorbable packs made of hydroxylated polyvinyl acetate. The airway integrated pack had a polyvinylchloride airway with an inner diameter of 5mm integrated into the packing material (Figure 2). The airway length was extended for 5mm outside the packing material on either end. Both packs were used in its compressed dehydrated form that increases in size within the nasal cavity.

Assignment to the group was carried out by computer generated series of random numbers. A standard operating procedure was established and all the members of the team were sensitised about it. Preoperatively all patients were evaluated with routine blood investigations, diagnostic nasal endoscopy and non-contrast computed tomography scan of Nose and PNS. All surgeries were done under general anaesthesia and anaesthetic management of the patients were standardized. Those diagnosed with deviated nasal septum, underwent standard endoscopic septoplasty and those who were diagnosed with chronic rhinosinusitis underwent Messerklinger Functional Endoscopic sinus surgery.

Postoperatively bilateral nasal packing was done with airway integrated nasal pack and mupirocin ointment in Group A and nasal pack without any airway and mupirocin ointment in Group B. The airway tube was periodically suctioned at 2nd hourly interval to minimize crusting and prevent clogging. Postoperatively all the patients received Injection Ceftriaxone 1gram administered intravenously as twice daily dose, tablet paracetamol 650mg thrice daily and tablet cetirizine 10 mg at bedtime. None of the patients received opiate analgesics or sedatives. Nasal packs were removed on the 2nd postoperative day in all patients.

Patients' subjective complaints such as nasal obstruction and difficulty in breathing were recorded using NOSE (Nasal Obstruction Symptom Evaluation) scoring system on the first postoperative day. Pain was recorded using visual analogue scale (VAS) at 1 hour, 06 hours and 24 hours after the surgery. Similarly, the quality of sleep was recorded using single item Sleep Quality scale (SQS) on the night of the surgery. All the data were recorded in Microsoft Excel and analysed using Statistical Package for Social Sciences (SPSS) software version 22.

RESULTS

A total of 70 patients were recruited for the study. The demographic characteristics of the two groups are as shown in [Table 1].

Severity of nasal obstruction and difficulty in breathing was compared as shown in [Table 2]. In Group-A 42.8% patients reported severe nasal obstruction compared to 60% in Group-B. Similarly, 37.1% in Group-A reported severe difficulty in breathing compared to 62.9% in Group-B. Statistically significant difference was observed, with $p<0.05$.

Post operative pain scores were compared as shown in [Table 3]. Statistically significant difference was observed, with $p<0.05$.

Quality of sleep was assessed between the two groups as shown in [Table 4]. The mean score in Group-A was 7.4 against 4.94 in Group-B, pertaining to a poor quality of sleep in the latter group. Statistically significant difference was observed, with $p<0.05$.

Table 1: Demographic characteristics of the study subjects.

Variables		Group A	Group B	p- value
Age; Mean±SD		33.94±10.4	34.66±12.3	0.797
Sex; N (%)	Male	18 (51.4)	13 (37.1)	0.282
	Female	17 (48.6)	22 (62.9)	

Table 2: Comparison of subjective complaints between the two groups

Complaints		Group A N (%)	Group B N (%)	p- value
Nasal obstruction	Mild	3 (8.6)	-	0.000*
	Moderate	5 (14.3)	3 (8.6)	
	Fairly bad	12 (34.3)	11 (31.4)	
	Severe	15 (42.8)	21 (60)	
Difficulty in breathing	Mild	5 (14.3)	-	0.000*
	Moderate	8 (22.9)	-	
	Fairly bad	9 (25.7)	13 (37.1)	
	Severe	13 (37.1)	22 (62.9)	

*Statistically significant.

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Table 3: Comparison of post-operative pain levels between the two groups.

Post-operative pain at	Group A Mean±SD	Group B Mean±SD	p- value
1 hour	8±0.254	8.3±0.212	0.044*
6 hours	5.4±0.303	7.4±0.203	0.000*
24 hours	4.6±0.24	7.1±0.188	0.000*

*Statistically significant.

Table 4: Comparison of Quality of sleep between the two groups.

	Group A Mean±SD	Group B Mean±SD	p- value
Quality of sleep	7.4±0.283	4.94±0.311	0.000*

*Statistically significant.

DISCUSSION

Post operative period is the most unpleasant part of any nasal surgery, as both the nasal cavities are packed with occlusive nasal packing causing significant discomfort to the patient in form of nasal obstruction, difficulty breathing, and poor quality of sleep. The occlusive nature of nasal packing causes complete nasal obstruction resulting in inability to breathe through the nose. Complete nasal packing also causes an increase in both nasal and pharyngeal resistance, especially at the oropharyngeal level.[2] Due to this it can interfere with regular breathing patterns and disrupt the architecture of sleep.[3] This is again worsened in patients with preexisting obstructive sleep apnoea syndrome which is usually a result of collapsible upper airway, leading to an increase in the number of episodes of apnoeas.[4] It may also cause serious nocturnal oxygen desaturation.[5] Also, nasal packing is known to cause short-lasting eustachian tube dysfunction most likely due to a combination of surgical oedema and a direct effect of the nasal packing. It is rarely severe enough to result in symptoms or middle ear effusion.[6,7] Despite this, anterior nasal packing after nasal surgery is essential for achieving haemostasis and mechanical splinting.

A wide variety of materials are available for nasal packing which can be classified broadly into non-absorbable and absorbable materials. Non-absorbable packs commonly used after nasal surgery includes medicated or paraffin-soaked ribbon gauze and Merocel packs (hydroxylated polyvinyl acetate). Absorbable materials commonly used are Surgicel (Oxidised cellulose), Nasopore (Polyurethane foam), etc. While the non-absorbable packs need removal usually after a period of 48 – 72 hours, the absorbable packs gradually resorb over time, alleviating the need for painful removal. Absorbable materials are associated with significantly slower mucosal healing and carry a greater risk of synechiae formation.[8,9]

This study found that the severity of subjective symptoms like nasal obstruction and difficulty breathing were lesser in Group A (nasal packing with integrated airway) than Group B (nasal packing without integrated airway). Around 42.8% patients in Group A reported severe nasal obstruction against 60% patients in Group B. Similarly, 37.1% patients reported severe breathing difficulty in Group A as compared to 62.9% patients in Group B. There was significant difference in the severity of symptoms reported among the two groups. Our findings were similar to findings reported by Gupta et al. The study reported that almost all patients who received nasal pack without any integrated airway had complaints like nasal obstruction with dry mouth, difficulty swallowing, and disturbed sleep whereas only 33-40% patients who received nasal pack with an integrated airway had similar complaints.[10]

This study found that post operative pain levels reported by patients who received integrated airway nasal packs at 1 hour, 6 hours and 24 hours were significantly less compared to the other group. A study by Jamil et al. also reported a similar finding, although they recoded post operative pain scores at 2nd and 24 hours post operatively. They reported that post operative pain was significantly less when nasal pack with integrated airway was used compared to nasal packing without integrated airway.[11] The mean postoperative pain score at 24 hours was 3.7±2.1 in the group with integrated airway nasal packs compared to 7.3±0.9 in the group with nasal pack without airway. These findings were similar to our study, wherein the mean pain score at 24 hours was 4.6±0.24 in Group A and 7.1±0.188 in Group B.

This study, also compared the quality of sleep among the two groups and found that patients of Group A who received integrated airway nasal packs had better quality of sleep compared to Group B who received nasal packing without integrated airway. This was only a subjective and qualitative assessment of sleep, but still observed a significant difference among the two groups. Gupta et al. reported that only 33% of patients with integrated airway complained of sleep disturbance compared to 80% of patients with nasal pack without any airway experiencing poor quality of sleep. Taasan et al. further studied the effect of nasal packing without any airway in causing nocturnal oxygen desaturation and called for further investigations regarding the same.[12]

Altogether, this study provides a comparative assessment of subjective complaints like nasal obstruction and difficulty in breathing, post operative pain and quality of sleep, among the two groups, wherein nasal packing was done with integrated airway and without any integrated airway. The findings of this study deepen our understanding about post operative care. Sheds new light on the need for airway integrated nasal packs. This study also calls for further research towards understanding of factors

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like nocturnal oxygen desaturation related to complete nasal packing.

Limitations: This is small sample, single-centre study. The groups were not homogenous for age and gender. Further assessment of variables like nasal obstruction, difficulty breathing and quality of sleep are limited by their subjectivity. The haemostatic potential of the two different packs could not be assessed although no significant difference was observed. The need for periodical suctioning of the airway tube was very crucial and required regular monitoring. If the airway tube is blocked by secretions or blood clots it compromises the purpose of the airway.

CONCLUSION

This study demonstrates that application of airway integrated nasal packs significantly reduces patients discomfort in terms of nasal obstruction and difficulty in breathing. Reduces post operative pain and improves quality of sleep when compared to nasal packing without integrated airway. Thus, airway integrated nasal packs are more comfortable to the patients and we recommend the use of airway integrated nasal packs.

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