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A COMPARATIVE STUDY OF THE PRE AND POST SYMPTOM SEVERITY IN PATIENTS WITH CHRONIC RHINOSINUSITIS IN TERTIARY CARE HOSPITAL

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ABSTRACT

Objectives: This present study was undertaken to study the comparison of the pre operative and post operative symptom severity and to compare sleep pattern of patients of different age groups with Chronic Rhinosinusitis. **Material and Methods:** A hospital-based observational study was conducted at Adesh Hospital, Bathinda for duration of 6 months on approximately 160 patients visiting the Department of Otorhinolaryngology, Adesh Institute of Medical Sciences and Research, Adesh Hospital, Bathinda. **Results:** The patients who have undergone the Functional Endoscopic Sinus Surgery reported reduced symptom severity after a follow up period of 2 months and patients within the age group of the 31-60 years suffered more sleep problems as compared to other age groups. **Conclusion:** The drastic changes seen in the post operative data as compared to pre operative data. The symptoms were mainly associated with the pre operative score and post operative score. The frequency of the four cardinal symptoms in pre and post operative period seems to be associated. Sleep problems are the common factors to be observed in chronic rhinosinusitis.

KEYWORDS: endoscopic, operative, cardinal, chronic rhinosinusitis, sinus

INTRODUCTION

One of the most important health issues in the world is rhinosinusitis. The European Position Paper on Nasal Polyps and Rhinosinusitis (EPOS) has mentioned nasal polyps and rhinosinusitis as an inflammation of the paranasal sinuses and nose, which was characterized by two primary symptoms, such as nasal over a 12-week period, nasal obstruction and discharge. Chronic Acute rhinosinusitis (CRS) is distinguished from chronic when the symptoms of rhinosinusitis (ARS) continue for at least 12 weeks. Nasal endoscopy findings have classified CRS into two categories: CRS with nasal polyposis (CRSwNP) and CRS without polyps (CRSsNP). Allergic and nonallergic rhinitis, as well as rarely anatomical abnormalities such a deviated nasal septum, were the most frequent causes of CRS. Antibiotics, corticosteroids, and nasal saline irrigation were used to treat CRS patients in attempt to lessen inflammation and increase paranasal sinus clearance. It has been established that CRS symptoms are detrimental to patients' quality of life and raise the cost of care. The total direct cost of CRS has been determined by numerous research, and according to one study from 2016, adjusted estimates for the US range between \$10 and 13 billion yearly. 9 The indirect cost of CRS, meanwhile, is thought to be above \$20 billion annually. Even while not all CRS patients require surgery, endoscopic sinus surgery (ESS) can have a number of positive effects on patients with persistent CRS.[Pham et al. 2019]

For ENT specialists, pulmonologists, and allergists, treating chronic rhinosinusitis with nasal polyposis (CRSwNP) poses a therapeutic challenge.

This inflammatory condition of the nose and paranasal sinuses with nasal polyps (NP) results in significant medical costs in the form of office visits, antibiotic prescriptions, and surgical procedures. Aspirin-exacerbated respiratory disease (AERD) or intolerance to non-steroidal anti-inflammatory medicines (NSAIDs) are frequently linked to CRSwNP in patients with asthma. This hard-to-treat population experiences more severe upper and lower airway disease, which is evidenced by a high rate of NP recurrence and a frequent requirement for endoscopic sinus surgery (ESS). There is no demonstrated causal correlation between CRSwNP and allergies, and the relationship between the two is still not fully understood.[Calus et al. 2019]

CRS endotypes have been designated by clinical and statistical work, with a recent focus on cluster analysis. Most research used clinical factors to perform

clustering on white individuals. For instance, Soler et al. showed that using 3 clinical factors, CRS patients could be divided into 5 clusters with various responses to surgical and medicinal treatments. Although those results are intriguing, the clusters found don't always correspond with or provide information about the pathogenic mechanisms at play. The impact of endotype on treatment response was not examined in their investigation, which excluded a number of inflammatory markers implicated in the pathophysiology of CRS from the definition of an endotype.

Due to the multimodal nature of CRS expression heterogeneity, which includes variation in clinical, physiological, and pathologic characteristics, classification calls for taking these various domains into account. Therefore, the purpose of the current study was to endotype Chinese patients with CRS by combining many variables into a single cluster analysis and to explore the relationship between endotype and clinical response to therapy. Previous research showed that patients with different racial backgrounds have significant disparities in the clinical and pathological characteristics of CRS.[Liao et al. 2019]

MATERIALS & METHODS

Study design and setting

This hospital-based observational study had been conducted at Department of Otorhinolaryngology, Adesh Institute of Medical Sciences and Research, Adesh Hospital Bathinda after getting approval from AIPBS College Research Committee and Ethics Committee for Biomedical and Health research, Adesh University.

Study criteria

Data was collected from patients suffering from chronic rhinosinusitis undergoing endoscopic sinus surgery via Symptom Severity scale and Sleep questionnaire form containing information regarding the determinants related to the chronic rhinosinusitis. The inclusion criteria involve the patients who were suffering from Chronic Rhinosinusitis in the Out-patient department and Inpatient department. Patients below the age of 18 years and Pregnant women were excluded from this study. Patients diagnosed with the psychological disorders were excluded from this study. Patients with history of steroid dependence were excluded.

Method of data collection

The data was collected using the pre-designed structured Symptom Severity scale and Sleep questionnaire form. This data collection tool used for study was an interview schedule that was held at the institute with assistance from faculty members and other experts. Before distributing the Symptom Severity scale and Sleep questionnaire form, the purpose of the study and the contents of the data collection form were clearly explained to the selected subjects and they were ensured confidentiality regarding their data. The selected subjects were the participant who visited the Department of Otorhinolaryngology at Adesh Hospital. A written consent form was obtained from the participants who were willing to participate in the study.

Statistical Analysis of data

All the data was recorded and analysis was done using IBM SPSS version 26.0[®] where Chi-square test was applied with p-value < 0.05.

RESULTS

Age in years

Chronic Rhinosinusitis was found to be more severe in the age group of 31-60 years [98 (61.3%)] followed by 18-30 years [61 (38.1%)] and then 61 above years [1 (.6%)]. Thus, the most severe age group by the Chronic Rhinosinusitis is 36-50 years.

S No.	Age in years	Frequency	Percent
1.	18-30 years	61	38.1
2.	31-60 years	98	61.3
3.	61above	1	.6
4.	Total	160	100.0

Table 1: Distribution

according to age in years

Gender

The severity of Chronic Rhinosinusitis is more in males [85(53.1%)] than in females [75(46.9%)], depending on the exposure to the risk factors associated with the disease.

S No.	Gender	Frequency	Percent
1.	Male	85	53.1
2.	Female	75	46.9
3.	Total	160	100.0

Table 2: Distribution according to the gender of the patients

Frequency of Pre operative score

There were 160 patients were included in the study. All the patients were assessed for the severity of chronic rhinosinusitis through a pre designed score. Pre operative score was taken before the endoscopic sinus surgery. 6 (3.8%) patients were having no problem in preoperative score, 66 (41.3%) patients were having mild severity in pre operative score, 87 (54.4%) patients were having moderate pre operative score and 1 (.6%) patients were having severe pre operative score.

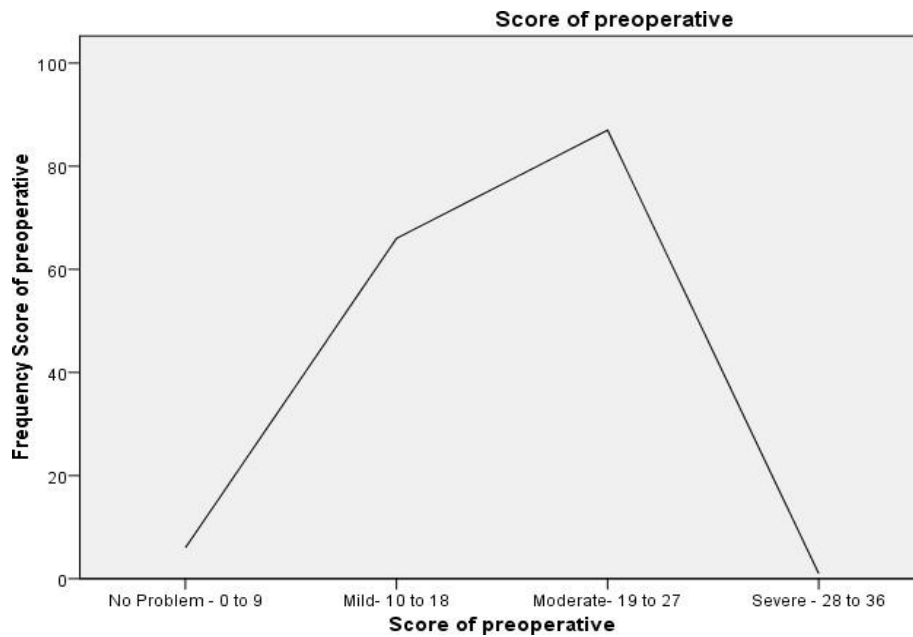


Figure 1: Frequency distribution of the pre operative score

Post operative score

Out of 160 patients that were included in the study. All the patients were assessed for the severity of chronic rhinosinusitis through a pre designed score. Post operative score was taken after t the endoscopic sinus surgery with a follow up period of 2 months. 62 (38.8%) patients were having no problem in post operative score, 79(49.4%) patients were having mild severity in post operative score, 18 (11.3%) patients were having moderate post operative score and 1 (.6%) patients were having severe post operative score.

S No.	Post operative score	Frequency	Percent
1.	No Problem - 0 to 9	62	38.8
2.	Mild- 10 to 18	79	49.4
3.	Moderate- 19 to 27	18	11.3
4.	Severe - 28 to 36	1	.6
5.	Total	160	100.0

Table 3: Distribution according to the gender of the patients

Preoperative and Postoperative score comparison

The study was performed with total of 160 patients. Before performing of surgery, preoperative score was assessed from the patients with a pre designed questionnaire. Out of 160 patients, 6 (3.8%) patients were assessed no problem severity while in the post operative the census increases up to 62(38.8%). In preoperative, 66 (41.3%) patients were having mild severity while in the post operative 79 (49.4%) patients had mild severity. The moderate severity in the pre operative accounts up to 87 (54.4%) patients which significantly decreases in post operative to the 18 (11.3%) patients. Only 1(.6%) patient was scored to the severe in the pre operative and no patient was score for severe problem in post operative score. The post operative data was taken before the endoscopic sinus surgery and the post operative data was taken after the follow up period of 2 months.

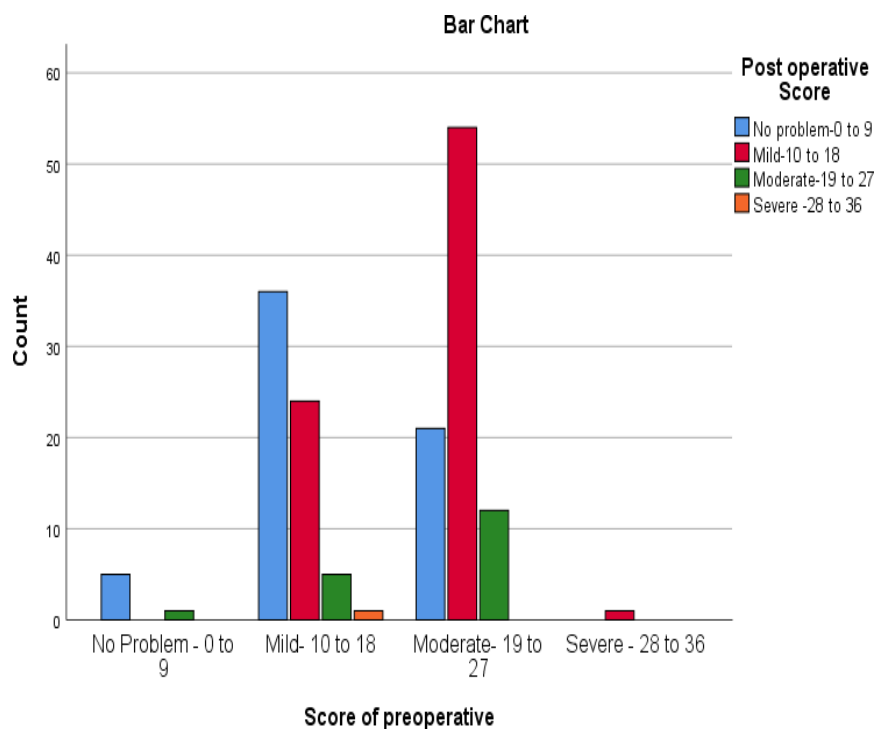


Figure 2: Comparison of the pre operative score and post operative score

Association of the four cardinal symptoms with the post operative score

Patients who were having no problem in thick nasal discharge are 43 (26.9%) out of which 27 (16.9%) have no problem in post operative score and 16 (10%) were having mild postoperative score. Patient who were having mild problem of thick nasal discharge were 77 (48.1%) out of which 27 (16.9%) patients were having no problem post operative score, 44 (27.5%) patients were having mild post operative score and 6 (3.8%) were having moderate post operative score. Patients who had no problem overall were 7(4.4%) in post operative score, 17 (10.6%) were having mild postoperative score and 11 (6.9%) patients had moderate postoperative score and 1(0.6%) having severe post operative score and all these patients which

adds up to 36 (22.5%) were found to have moderate problem in thick nasal discharge. 4 (2.5%) patients were having severe problem in Thick nasal discharge, out of which 1 (0.6) patient was assessed with no problem post operative score, 2(1.3%) patients were having mild post operative score and 1 (0.6%) were having moderate postoperative score .

Patients who were having no problem in Facial Pain are 36(22.5%) out of which 25 (15.6%) have no problem in post operative score and 11 (6.9%) were having mild postoperative score Patient who were having mild problem of Facial Pain were 91 (56.9%) out of which 30 (18.8%) patients were having no problem post operative score, 51 (31.9%) patients were having mild post operative score and 9 (5.6%) were having moderate post operative score and 1 (0.6%) patient was assessed with severe post operative score. Patients who had no problem overall were 5(3.1%) in post operative score, 17 (10.6%) were having mild postoperative score and 7 (4.4%) patients had moderate postoperative score and all these patients which adds up to 29 (18.1%) were found to have moderate problem in Facial Pain. 2 (1.3%) patients were having severe problem in Facial Pain, 2(1.3%) patients were having moderate post operative score.

Patients who were having no problem in decreased sense of smell are 47(29.4%) out of which 29 (18.1%) have no problem in post operative score and 16 (10%) were having mild postoperative score and 2 (1.3%) patients were founded to have moderate post operative score. Patient who were having mild problem of decreased sense of smell were 70 (43.8%) out of which 26 (16.3%) patients were having no problem post operative score, 40 (25%) patients were having mild post operative score and 3 (1.9%) were having moderate post operative score and 1 (0.6%) patient was assessed with severe post operative score. Patients who had no problem overall were 6(3.8%) in post operative score, 23 (14.4%) were having mild postoperative score and 11 (6.9%) patients had moderate postoperative score and all these patients which adds up to 40 (25%) were found to have moderate problem in decreased sense of smell. 3(1.9%) patients were having severe problem in

Facial Pain, 2(1.3%) patients were having moderate post operative score and 1(0.6%) patient found to have no problem in post operative score.

The association of severity of nasal blockage with post operative score is highly significant with p-value (0.000) and association of severity of thick nasal discharge with post operative score is highly significant with p-value (0.007). The association of severity of thick nasal discharge with post operative score is highly significant with p-value (0.006) and association of severity of decreased sense of smell with post operative score is highly significant with p-value (0.003).

Association of the sleep problems in different age groups

Sleep problems are the common factors to be observed in chronic rhinosinusitis. In this study, sleep problems had occurred to patients which were recorded on the sleep questionnaire. Patients were divided into different age groups and questions were asked about their sleep pattern. Patients of the age group of 18 -30 years were 61 (38.1%) in total, out of which 32 (20%) reported good sleep, 24 (15%) reported moderate sleep and 5 (3.1%) reported poor sleep. In the age group of 31 -60 years, there were 98 (61.3%) patients in which 36 (22.5%) reported good sleep, 59 (36.9%) were assessed with moderate sleep and 3 (1.9%) were assessed with poor sleep.

S No.	Age	Scoring criteria for Sleep quality			
		0-6 (good)	7-12 (moderate)	13-18 (poor)	Total
1.	18-30	32	24	5	61
		20.0%	15.0%	3.1%	38.1%
2.	31-60	36	59	3	98
		22.5%	36.9%	1.9%	61.3%
3.	61 Above	1	0	0	1
		0.6%	0.0%	0.0%	0.6%
4.	Total	69	83	8	160
		43.1%	51.9%	5.0%	100.0%

Table 4: Association of the sleep problems with the age group

DISCUSSION

The study was aimed to determine the comparison of the pre operative and post operative symptom severity and compare the sleep pattern of patients of different age groups with Chronic Rhinosinusitis. It was a hospital-based study in which pre operative and post operative symptom severity of patients were assessed. In this study Pearson's Chi-Square Test for p-value <0.05 is applied. There has been noted that there is significantly decrease in the symptom severity score in post operative period. The four cardinal symptoms had shown association with the both pre operative and post operative score. The sleep problems has been recorded in the patients. Patients with the age group 31 -60 years has seen more sleep problems as compared to 18-30 years.

CONCLUSION

The present study was conducted to study the comparison of the pre operative and post operative symptom severity and compare the sleep pattern of patients of different age groups with Chronic Rhinosinusitis. The efficacy of the treatment given to the patients was determined by the pre operative and post operative score. The pre operative score was taken before performing treatment on the patients. Post operative data was taken after the follow up of 2 months from the surgery. The drastic changes seen in the post

operative data as compared to pre operative data. The symptoms were mainly associated with the pre operative score and post operative score. The frequency of the four cardinal symptoms in pre and post operative period seems to be associated. Sleep problems are the common factors to be observed in chronic rhinosinusitis. In this study, sleep problems had occurred to patients which were recorded on the sleep questionnaire. Patients were divided into different age groups and questions were asked about their sleep pattern. Patients of the age group of 18 -30 years were 61 (38.1%) in total, out of which 32 (20%) reported good sleep, 24 (15%) reported moderate sleep and 5 (3.1%) reported poor sleep. In the age group of 31 -60 years, there were 98 (61.3%) patients in which 36 (22.5%) reported good sleep, 59 (36.9%) were assessed with moderate sleep and 3 (1.9%) were assessed with poor sleep.

REFERENCES

- Bayer, K., Hamidovic, S., Besser, G., Mueller, C. A., & Liu, D. T. (2022). Factors Associated with Revision Sinus Surgery in Patients with Chronic Rhinosinusitis. *Journal of Personalized Medicine*, 12(2), 167. <https://doi.org/10.3390/jpm12020167>
- Calus, L., Van Bruaene, N., Bosteels, C., Dejonckheere, S., Van Zele, T., Holtappels, G., ... & Gevaert, P. (2019). Twelve-year follow-up study after endoscopic sinus surgery in patients with chronic rhinosinusitis with nasal polyposis. *Clinical and translational allergy*, 9(1), 1-11. <https://doi.org/10.1186/s13601-019-0269-4>
- Smith, T. L., Schlosser, R. J., Mace, J. C., Alt, J. A., Beswick, D. M., DeConde, A. S & Soler, Z. M. (2019, August). Long-term outcomes of endoscopic sinus surgery in the management of adult chronic rhinosinusitis. In *International forum of allergy & rhinology* (Vol. 9, No. 8, pp. 831-841). <https://doi.org/10.1002%2Ffalr.22369>
- Gelardi, M., Piccininni, K., Quaranta, N., Quaranta, V., Silvestri, M., & Ciprandi, G. (2019). Olfactory dysfunction in patients with chronic

rhinosinusitis with nasal polyps is associated with clinical-cytological grading severity. *Acta Otorhinolaryngologica Italica*, 39(5), 329 <https://doi.org/10.14639%2F0392-100X-2426>

- Eloy, J. A., Marchiano, E., & Vázquez, A. (2017). Extended endoscopic and open sinus surgery for refractory chronic rhinosinusitis. *Otolaryngologic Clinics of North America*, 50(1), 165-182. <https://doi.org/10.1016/j.otc.2016.08.013>
- Hanna, B. M., Crump, R. T., Liu, G., Sutherland, J. M., & Janjua, A. S. (2017). Incidence and burden of comorbid pain and depression in patients with chronic rhinosinusitis awaiting endoscopic sinus surgery in Canada. *Journal of otolaryngology - head & neck surgery = Le Journal d'oto-rhino-laryngologie et de chirurgie cervico-faciale*, 46(1), 23. <https://doi.org/10.1186/s40463-017-0205-3>
- El Rassi, E., Mace, J. C., Steele, T. O., Alt, J. A., & Smith, T. L. (2016, April). Improvements in sleep-related symptoms after endoscopic sinus surgery in patients with chronic rhinosinusitis. In *International forum of allergy & rhinology* (Vol. 6, No. 4, pp. 414-422 <https://doi.org/10.1002/alr.21682>
- Hayer, S. D., Rabago, D. P., Amaza, I. P., Kille, T., Coe, C. L., Zgierska, A., Zakletskaia, L., Mundt, M. P., Krahn, D., Obasi, C. N., & Molander, R. C. (2015). Effectiveness of nasal irrigation for chronic rhinosinusitis and fatigue in patients with Gulf War illness: protocol for a randomized controlled trial. *Contemporary clinical trials*, 41, 219–226 <https://doi.org/10.1016/j.cct.2015.01.008>
- Rudmik, L., Soler, Z. M., Mace, J. C., Schlosser, R. J., & Smith, T. L. (2015). Economic evaluation of endoscopic sinus surgery versus continued medical therapy for refractory chronic rhinosinusitis. *The Laryngoscope*, 125(1), 25-32. <https://doi.org/10.1002/lary.24916>
- Alt, J. A., Smith, T. L., Schlosser, R. J., Mace, J. C., & Soler, Z. M. (2014, September). Sleep and quality of life improvements after endoscopic sinus surgery in patients with chronic <https://doi.org/10.1002/alr.21364>

- DeConde, A. S., Bodner, T. E., Mace, J. C., & Smith, T. L. (2014). Response shift in quality of life after endoscopic sinus surgery for chronic rhinosinusitis. *JAMA Otolaryngology–Head & Neck Surgery*, 140(8), 712-719. Doi:10.1001/jamaoto.2014.1045
- Thottam, P. J., Hauptert, M., Saraiya, S., Dworkin, J., Sirigiri, R., & Belenky, W. M. (2012). Functional endoscopic sinus surgery (FESS) alone versus balloon catheter sinuplasty (BCS) and ethmoidectomy: a comparative outcome analysis in pediatric chronic rhinosinusitis. *International Journal of Pediatric Otorhinolaryngology*, 76(9), 1355-1360 <https://doi.org/10.1016/j.ijporl.2012.06.006>
- Achar, P., Duvvi, S., & Kumar, B. N. (2012). Endoscopic dilatation sinus surgery (FEDS) versus functional endoscopic sinus surgery (FESS) for treatment of chronic rhinosinusitis: a pilot study. *Acta Otorhinolaryngologica Italica*, 32(5) <https://pubmed.ncbi.nlm.nih.gov/23326011>