Original Research Paper

Volume - 13 | Issue - 03 | March - 2023 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

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ASSESSMENT OF OUTCOME OF FUNCTIONAL ENDOSCOPIC SINUS SURGERY IN PATIENTS WITH CHRONIC SINUSITIS WITH OR WITHOUT SINONASAL POLYPOSIS

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ABSTRACT Chronic rhinosinusitis is a well-recognised clinical syndrome, affecting patients of all ages and gender, chronic rhinosinusitis is characterized by inflammation of the mucous membranes of the nasal cavity and the paranasal sinuses, with typical symptoms that persist for more than 12 weeks and objective criteria using nasal endoscopic findings and or CT scan findings. Chronic sinusitis may be associated with nasal polyposis. Sinonasal allergy is often a coincidental finding. Treatment of chronic sinusitis can be medical or surgical. However, with the advancement of endoscopic surgical procedures over the past two decades, the surgical management of sinusitis has completely changed. Functional endoscopic sinus surgery (FESS) is a minimally invasive technique in which the sinus ostia are opened under direct visualization, with an aim to restore sinus ventilation and normal function. FESS has now become a well-established surgical modality in the treatment of sinusitis refractory to medical treatment. However, there is a conspicuous lack of good surgical evidence on the efficacy of this intervention. Hence, we have undertaken this study on subjective and objective assessment of outcome of FESS in cases of chronic sinusitis, using the QOL instrument SNOT 22 questionnaire and Lund Kennedy endoscopic scoring system.

KEYWORDS : Chronic Rhinosinusitis, Nasal Symptoms, FESS, SNOT.

INTRODUCTION

Chronic rhinosinusitis is a major health problem affecting with significant impact on the quality of life. Various local and systemic factors can contribute to the pathogenesis of chronic rhino-sinusitis. Chronic sinusitis may be associated with nasal polyposis. Treatment of chronic sinusitis can be medical or surgical. Medical modalities of the therapy include topical steroid sprays, nasal douching with saline and long term antibiotic therapy. surgical techniques include antral lavage, Caldwell Luc procedure, intranasal polypectomy, external or transantral ethmoidectomy and external frontal sinus surgery.

Functional endoscopic sinus surgery (FESS) is a minimally invasive technique in which the sinus ostia are opened under direct visualization, with an aim to restore sinus ventilation and normal function. Though FESS has now become a well-established surgical modality, there is a conspicuous lack of good surgical evidence on the efficacy of this intervention and how it can improve the quality of life.

AIMS & OBJECTIVES OF THE STUDY

To assess the outcome of functional endoscopic sinus surgery (FESS) in patients with chronic sinusitis with or without nasal polyposis using the quality-of-life assessment instrument SNOT 22 questionnaire and endoscopic scoring.

METHODOLOGY

50 patients Clinically diagnosed with Chronic Sinusitis (EP3OS 2007 guidelines) with or without sinonasal polyposis, above the age of 18years and both sexes attending ENT OPD and admitted in ENT ward in GGH Kurnool were studied.

RESULTS

Sinonasal polyposis was present in 26% of the study participants with rhinosinusitis. The major symptoms pronounced in these patients where, Dizziness, Ear pain, Embarrassment, sneezing, Nasal discharge and sadness due to the illness. There was a statistically significant improvement in symptoms after FESS surgery.

DISCUSSION

Chronic rhinosinusitis with nasal polyposis is a long-term inflammatory condition that causes significant morbidity. They have been linked to allergies, asthma, infection, cystic fibrosis, and aspirin sensitivity. Nasal obstruction, anosmia, rhinorrhoea, post nasal drip, and, less commonly, facial pain are common symptoms. In the present study the prevalence of sinonasal polyposis was 26% which is comparable to the existing literatures. A systemic review conducted by chen et al estimated that it affects 1-4% of the general population and 25-30% of chronic rhinosinusitis patients (1).

Similarly, in a record-based study of 4,986 patients with asthma and rhinitis at the Rhode Island Hospital, the frequency of nasal polyps was 4.2% in the total population; 6.7% in the asthmatic population, and 2.2% in the rhinitis alone group. Asthmatics with negative skin tests for inhalant allergens had 12.5% more nasal polyps than asthmatics with positive skin tests, p less than 0.01. The occurrence of nasal polyps increased with age. 71% of the 211 nasal polyp cases had asthma, while 29% had rhinitis alone. In addition, 14% of patients with nasal polyps had aspirin intolerance, primarily bronchospastic. In addition, 1,051 patients with asthma and rhinitis from the Pediatric Allergy Clinic with a mean age of 6 yrs. were similarly evaluated. Only 1 (0.1%) of these pediatric patients had nasal polyps (2).

US based studies shows, Chronic sinusitis with polyps is a sinus inflammation that lasts more than 12 weeks and is accompanied by nasal polyps. This condition accounts for a large portion of sinus surgery performed in the Michigan area, and most likely in the United States as a whole (3).

In another study done by Kwah et al, the authors concluded that, Rhinosinusitis is an inflammation of one or more of the paranasal sinuses that affects about 12% of the population. Acute rhinosinusitis is defined as symptoms lasting less than 12 weeks, whereas chronic rhinosinusitis (CRS) is defined as symptoms lasting more than 12 weeks. CRS is classified as either having nasal polyps (CRSwNP), having no nasal polyps (CRSsNP), or having allergic fungal rhinosinusitis. Nasal polyps are inflammatory outgrowths of the paranasal sinus mucosa caused by chronic mucosal inflammation and are found in 20% of CRS patients (4).

Another study done by Benjamin et al in europe concluded that, Chronic rhinosinusitis without nasal polyps (CRSsNP) accounts for the vast majority of chronic rhinosinusitis cases. Approximately 82% of the total chronic rhinosinusitis population had CRSsNP, while 18% had CRSwNP. 319 (63%) of the 507 patients in the CRSsNP group were female, compared to 393 (45%) of the 847 patients in the CRSwNP group. Atopy was found in 52% of CRSsNP versus 76% of CRSwNP (P.0001). Atopic patients in CRSsNP had more severe radiographic disease than nonatopic patients (P.005). Asthma prevalence was 36% in CRSsNP versus 56% in CRSwNP (P.0001). Comorbid asthma was not associated with radiographic sinus disease severity in CRSsNP but was (P.0001) in CRSwNP.

A study done by Steven et al concluded that Males are more likely to be affected than females, but no specific genetic or environmental factors have been strongly linked to the development of this disorder to date (5). This is the same case scenario in this study also with males being the most number of cases (62%).

A large systemic review and meta-analysis involving 40 unique patient cohorts published from 2008–2016, the results showed, at an average follow-up of 10.6 months, all studies found a statistically significant

difference in mean SNOT-22 scores between baseline and post-operative time points (p0.001). The overall summary change in mean SNOT-22 was 24.4 (95% CI: 22.0-26.8). Studies with a higher mean preoperative SNOT-22 score and a higher asthma prevalence were associated with greater changes in SNOT-22 score after ESS, whereas studies with a longer mean follow-up had smaller changes in SNOT-22 score (6). This is consistent with our present study with significant difference in SNOT score pre and psot OP after FESS surgery. In the meta analysis, at an average follow-up of 10.6 months, all studies in this cohort had an individual, statistically significant change in mean SNOT-22 scores between baseline and post-operative time points (p0.001). The overall mean change in SNOT-22 was 24.4 (95% CI: 22.0-26.8; I2=13.5%).

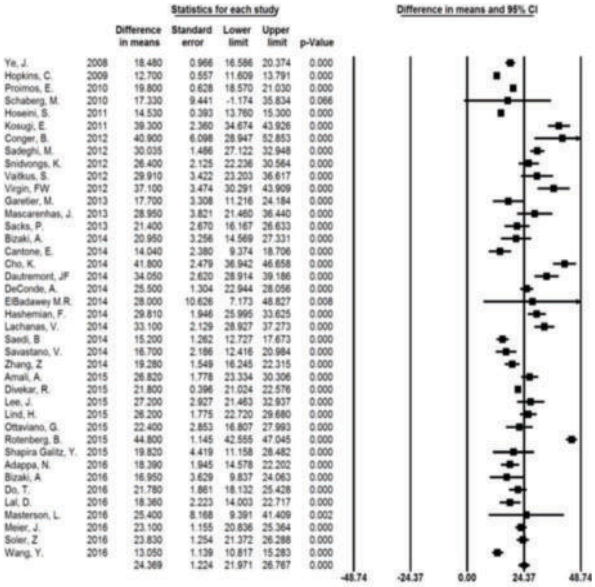

Figure 1: Comparison of statistics of different studies

In a study conducted by Hopkins et al in England and Whales, covering a total of 3128 consecutive patients at 87 NHS hospitals, the authors concluded that, SNOT-22 scores improve significantly from the pre-operative period (mean = 42.0) to 3 months after surgery (mean = 25.5). Patients undergoing nasal polypectomy improved from 41.0 before surgery to 23.1 three months later, while patients undergoing chronic rhinosinusitis surgery alone improved from 44.2 to 31.2. The SNOT-22 scores at 12 and 36 months after surgery were comparable to those at 3 months.

Similar to our study results, a Brazilian based study done by kosugi et al, showed that there was greater improvement in SNOT-22 in patients with polyps compared to those without (7).

In a study done by Begh et al, the results showed, Preoperative SNOT scores were higher (54±8.05), but after FESS they were significantly lower at 1st (16.47±5.51), 3rd (13.86±4.19), and 6th months (12.9±8.05). Chronic rhinosinusitis (CRS) patients with nasal polyposis had a greater mean difference in SNOT-22 scores (43.93) between the preoperative and 3 months' postoperative periods than CRS patients without nasal polyposis (41.47). The authors came to the conclusion that FESS is the best surgical treatment for chronic rhinosinusitis. It significantly improves the quality of life of chronic rhinosinusitis patients. Our study results were similar to the above study.

When analyzed for the differences in the scores of individual components of SNOT 22 in pre-op and post op period most of them had evident improvement in their symptoms.

These individual results of SNOT 22 were similar to the results of a study done by Laababsi et al which showed statistical significant improvement in individual as well as overall score of SNOT 22 in terms of rhinologic symptoms, Extra nasal rhinologic symptoms, Ear/facial symptoms, Psychological dysfunction and Sleep dysfunction.

As polyps get larger, filling 75% to 90% of the nasal cavity, patients really start to complain of nasal obstruction (3). The need to bow nose very often is again triggered by the foreign body or obstructed sensation felt by the patients with large polyps. The clear improvement in the clearance of decreased need to blow nose and decrease in felling of blocked nose indirect indicates an effective surgical result after FESS to relieve this obstruction.

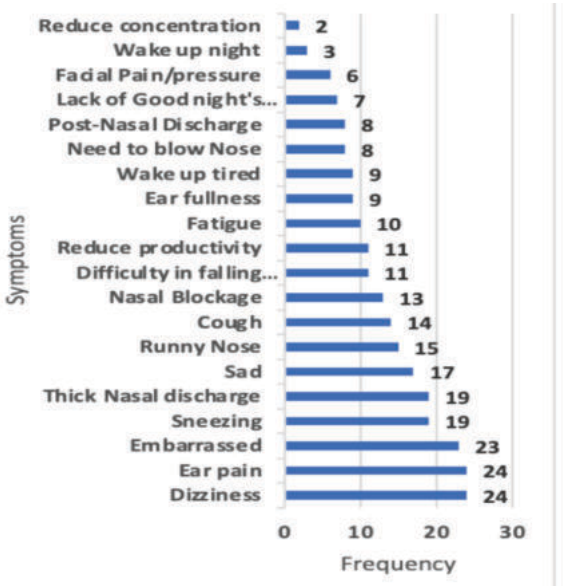

Figure 2: Symptoms and their frequency of occurrence in patients

When polyps cover 50% or more of the nasal cavity, the air in the nasal cavity becomes blocked and does not reach the area where the smell nerves are located. When air and odors cannot reach the nerve endings, a person cannot smell well or at all - and thus cannot taste well, because much of our sense of taste is related to our sense of smell. A reduced sense of smell is a common complaint in individuals with nasal polyposis, and hyposmia is typically linked to nasal airway obstruction. Olfaction may be affected by the duration of nasal polyposis and nasal surgery (8). The improvement in the olfactory and gustatory function was consistent similar to the study results of Jiang et al. Their study results of 43 patients showed, SNOT-22 considerably improved 3 months following FESS in all CRS patients. Endoscopic score and olfactory function improved considerably in patients with eosinophilic CRS and nasal polyps (CRSwNP). In patients with CRSwNP, the WMTT sweet and bitter ratings were significantly reduced following FESS, whereas the TQT sweet score was significantly greater. Furthermore, 3 months after FESS, patients with noneosinophilic CRS had significantly lower WMTT and salty scores (9).

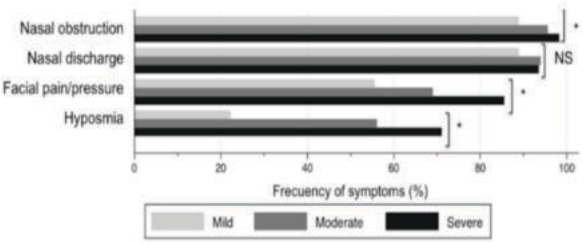

Figure 3: Severity of symptoms

The improvement in the olfactory function was also similar to the study results of Hintschich et all, Which showed that the worse the presurgical olfaction, the greater the likelihood of SNOT-20 improvement following surgery: The SNOT-20 improved in 64% of anosmic and 62% of hyposmic patients, but only 30% of normosmic people (10).

Because patients can't breathe through their nose, they mouth breathe while sleeping, causing them to snore. Sometimes nasal polyps can make snoring severe enough to tip a patient who snores over to sleep apnea – which has a substantial effect on patients. Patients **with sleep apnea** don't sleep well, and they are at higher risk for other health problems, including heart disease, heart attack, stroke, and memory

and concentration problems (3). Obstructive sleep apnea syndrome (OSAS) is defined by recurring episodes of upper airway obstruction during sleep, which results in hypoxemia, apnea, and sleep fragmentation. OSAS is caused primarily by functional and anatomic reasons.

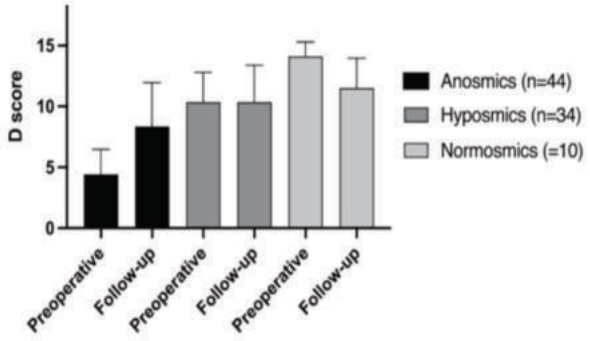

Figure 4: Improvement in olfactory function after FESS surgery.

Studies shows that, the most essential functional element is pharyngeal collapse, and the primary anatomical feature is a reduction in the diameter of the naso-oro-hypopharyngeal segment. If a patient has a nasal obstruction, they must breathe through their mouth, which narrows the upper airway and makes it more collapsible to inspiratory negative pressure. Patients with chronic rhinosinusitis had poor sleep quality, which improved after sinus surgery. Sinus surgery, on the other hand, did not enhance polysomnographic findings in individuals with CRSwNP but did increase their Epworth Sleepiness Scale score (ESS) (11).

Sleep is critical to one's health and well-being. Sleep deprivation is thought to be exacerbated by nasal congestion/obstruction due to polyposis and other similar conditions of nasal cavity. Sleep-disordered breathing, sleep apnea, and snoring are all connected with nasal congestion/obstruction and are associated with nasal polyps. These have a big socioeconomic impact. The socioeconomic costs include treatment expenditures as well as the secondary cost of decreased productivity caused by the impact of symptoms on patients' life and the usage of ineffective medicines.

In a study done by Serrano et al, Patients with nasal polyposis showed a 2-fold higher incidence of sleep problems than controls in a population-based case-control study (12).

Similarly, in a cross-sectional study done by Migueis et al, to assess Obstructive sleep apnea in patients with chronic rhino sinusitis with nasal polyps, Thirty-one apneic patients with CRSwNP and 62 apneic cases without NP were studied. Both groups had nasal endoscopies, Epworth Sleepiness Scale (ESS) assessments, and overnight polysomnography (PSG). We also used the STOP-Bang questionnaire to collect anthropometric data such as snoring, weariness, observed apnea, high blood pressure, body mass index (BMI), age, neck circumference, male gender, and OSA risk. Despite the fact that the lowest median oxygen saturation was not statistically different between groups, the median ESS exhibited low somnolence and a low median apnea-hypopnea index in patients with CRSwNP. The authors concluded that anthropometric features in people with apnea induced by CRSwNP differed considerably from those in people with normal apnea (13).

In a prospective study done by Giri et al to assess the Sleep disturbances in patient with chronic nasal obstruction due to nasal polyp. According to the authors, nasal congestion/obstruction is a primary cause of sleep disturbance. Patients with nasal polyps typically complain of nasal blockage, snoring, and increased daytime sleepiness. As a result, nasal blockage treatment greatly reduces snoring and sleep quality. Patients who have endoscopic sinus surgery may enjoy l ess snoring and greater sleep quality, as well as less daytime tiredness.

Similarly in a study done by Tosun et al to assess the Impact of endoscopic sinus surgery on sleep quality in patients with chronic nasal obstruction due to nasal polyposis, among Twenty-seven patients with nasal polyposis, filling at least 50% of each nasal passage, Assessment of nasal patency was determined by nasal endoscopy and acoustic rhinometry. Endoscopic sinus surgery with polypectomy was performed on all patients. Before and three months after surgery, sleep quality was assessed using a visual analogue scale, Epworth sleepiness scale, and polysomnography. The findings revealed that nasal resistance decreased considerably after surgery (P 0.01). Snoring scores decreased significantly (P 0.01) after surgery and entirely eliminated in 9 of 27 individuals. Mean daytime sleepiness scores improved significantly in the postoperative period (4.14) as compared to preoperative values (9.44; P 0.01). There was no significant difference in apnea-hypopnea index mean values between preoperative (6.85) and postoperative (5.53) (P = 0.55). Endoscopic sinus surgery with polypectomy significantly improves sleep quality, including snoring and daytime sleepiness, in patients with chronic nasal obstruction due to nasal polyposis, according to the authors similar to our study results.

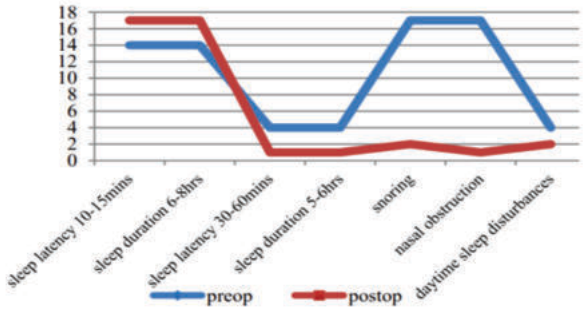

Figure 5: Impact of endoscopic sinis Surgery on sleep quality.

Sleep disturbance is one of the major contributing factor for various psychological problems like, feeling embarrassed or sad, Frustration, Restless or irritable, Reduced concentration at work or study which can overall lead to a decrease in productivity of the affected individual. When the rot problem is addressed via an effective intervention all the above mentioned issues resolves and there is overall improvement in the patient's quality of life (14). This was evidently and statistically proven from the results of the current study.

In a Prospective, Cohort study done by Kurien et al, among patients attending a teritiary care centre in south India, to assess the Impact of Functional Endoscopic Sinus Surgery on Patients with Chronic Rhinosinusitis, the authors have concluded that, FESS improves both endoscopic and quality of life outcomes for patients with CRS with and without polyps and also Postoperative follow-up with both endoscopy and SNOT-22 scores helps in monitoring both symptomatic improvement and disease activity in patients with Chronic rhino sinusitis (15).

CONCLUSION

FESS is proved to be an effective method in improving the symptomatic outcome in the patients with Rhinosinusitis in our study. It is evident that the routine use of tools like SNOT 22 in preop and post op period can help in monitoring both symptomatic improvement and disease activity in patients with Chronic rhino sinusitis.

Sinonasal polyposis was present in 26% of the study participants with rhinosinusitis. The major symptoms pronounced in these patients where, Dizziness, Ear pain, Embarrassment, sneezing, Nasal discharge and sadness due to the illness. There was a statistically significant improvement in symptoms after FESS surgery. Hence FESS is proved to be an effective method in improving the symptomatic outcome in the patients with Rhinosinusitis.

It is evident from our study that the routine use of tools like SNOT 22 in preop and post op period can help in monitoring both symptomatic improvement and disease activity in patients with Chronic rhino sinusitis.

REFERENCES:

1. Aiello, M. A., and Leuzzi, F. (2010), "Waste Tyrerubberized concrete: Properties at fresh and hardened state." Journal of Waste Management, ELSEVIER, 30,1696-1704.
2. Chen S, Zhou A, Emmanuel B, Thomas K, Guiang H. Systematic literature review of the epidemiology and clinical burden of chronic rhinosinusitis with nasal polyposis. Current Medical Research and Opinion. 2020 Nov 1;36(11):1897–911.
3. Settipane GA, Chafee FH. Nasal polyps in asthma and rhinitis. A review of 6,037 patients. J Allergy Clin Immunol. 1977 Jan;59(1):17–21.
4. Chronic Sinusitis and Nasal Polyps | Michigan Medicine [Internet]. [cited 2022 Oct 21]. Available from: https://www.uofmhealth.org/conditions-treatments/ear-nose-throat/sinus/chronic-sinusitis-nasal-polyps
5. Kwah JH, Peters AT. Nasal polyps and rhinosinusitis. Allergy Asthma Proc. 2019 Nov 1;40(6):380–4.

6. Ww S, Rp S, Rc K. Chronic Rhinosinusitis with Nasal Polyps. The journal of allergy and clinical immunology In practice [Internet]. 2016 Aug [cited 2022 Oct 21];4(4). Available from: https://pubmed.ncbi.nlm.nih.gov/27393770/
7. Soler ZM, Jones R, Le P, Rudmik L, Mattos JL, Nguyen SA, et al. SNOT-22 Outcomes after Sinus Surgery: A Systematic Review and Meta-analysis. Laryngoscope. 2018 Mar;128(3):581–92.
8. Kosugi EM, Chen VG, Fonseca VMG da, Cursino MMP, Mendes Neto JA, Gregório LC. Translation, cross-cultural adaptation and validation of SinoNasal Outcome Test (SNOT): 22 to Brazilian Portuguese. Braz J Otorhinolaryngol. 2011 Oct;77(5):663–9.
9. Vento SI, Simola M, Ertama LO, Malmberg CH. Sense of smell in long-standing nasal polyposis. Am J Rhinol. 2001 Jun;15(3):159–63.
10. Jiang RS, Shih KH, Liang KL. Effect of Functional Endoscopic Sinus Surgery on Gustatory Function in Patients With Chronic Rhinosinusitis. Ear Nose Throat J. 2021 May 12;1455613211015754.
11. Hintschich CA, Pade J, Petridis P, Hummel T. Presurgical olfactory function as an indicator of the outcome of functional endoscopic sinus surgery in chronic rhinosinusitis with nasal polyps. Eur Arch Otorhinolaryngol [Internet]. 2022 Jun 24 [cited 2022 Oct 21]; Available from: https://doi.org/10.1007/s00405-022-07496-3
12. Uz U, Günhan K, Yılmaz H, Ünlü H. The evaluation of pattern and quality of sleep in patients with chronic rhinosinusitis with nasal polyps. Auris Nasus Larynx. 2017 Dec 1;44(6):708–12.
13. Serrano E, Neukirch F, Pribil C, Jankowski R, Klossek JM, Chanal I, et al. Nasal polyposis in France: impact on sleep and quality of life. J Laryngol Otol. 2005 Jul;119(7):543–9.
14. Migueis DP, Lacerda GCB, Lopes MC, Azevedo-Soster LMSF, Thuler LCS, Lemes LNA, et al. Obstructive sleep apnea in patients with chronic rhinosinusitis with nasal polyps: a cross-sectional study. Sleep Medicine. 2019 Dec 1;64:43–7.
15. Sivertsen B, Björnsdóttir E, Øverland S, Bjorvatn B, Salo P. The joint contribution of insomnia and obstructive sleep apnoea on sickness absence. J Sleep Res. 2013 Apr;22(2):223–30.
16. jp-journals-10013-1333.pdf [Internet]. [cited 2022 Oct 27]. Available from: https://www.aijcr.com/doi/AIJCR/pdf/10.5005/jp-journals-10013-1333