

## Original research article

**Study of FESS Outcome in Adults with Chronic Rhinosinusitis****Dr. Krishna Kinkar das<sup>1</sup>, Dr. Zaid Shaikh<sup>2</sup>, Dr. Anwer Shah P A<sup>3</sup>**<sup>1</sup>Senior Resident, Department of ENT Head & Neck Surgery AIIMS Bhubneshwar<sup>2</sup>Junior Resident, Department of ENT Head & Neck Surgery AIIMS Bhubneshwar<sup>3</sup>Junior Resident, Department of ENT Head & Neck Surgery AIIMS Bhubneshwar**Corresponding Author: Dr. Krishna Kinkar Das****Abstract**

**AIM-** This study is designed to compare the symptomatic profile of Chronic Rhinosinusitis before and after FESS by SNOT-20 questionnaire.

**Materials and Method:** An Observational Prospective study was conducted among patients attending the Department of ENT, Head & Neck Surgery AIIMS Bhubneshwar, Study duration of two years. A group of 40 patients with symptom of CRS were included in the study.

**Results :** Of the total 40 patients enrolled in the study 29 patients (73%) were males and 11 patients (27%) were females. 34 (85%) patients had bilateral CRS and 6 (15%) patients had unilateral sinusitis. Mean SNOT-20 baseline score is 56.93 and post op 6 month mean score is 10.75. There is a significant association ( $p < 0.005$ ) seen between baseline and post op 1 week, 2 week, 1 month, 3 month and 6 month.

**Conclusion :** In this prospective study we found that 93% patients with symptomatic CRS refractory to medical management had significant improvement (No disease, Mild disease) in the overall symptom score after FESS attempt of 6 month follow up. So FESS does have a beneficial role in patients with Moderate to Severe disease as per SNOT-20 questionnaire.

**Keywords:** Chronic rhinosinusitis; Functional Endoscopic Sinus Surgery; SNOT-20; Outcome.

**Introduction**

In the early twentieth century, Mosher said that intranasal ethmoidectomy is one of the most dangerous and blindest of all surgeries. This view changed dramatically with the advent of the endoscopes. Throughout the history of medicine numerous attempts have been made to illuminate and examine the inside of the various hollow cavities located within the body.

In 1907, Hirschmann used a modified cystoscope to examine the middle meatus and study sinus ostia<sup>1</sup>. The most significant development in nasal endoscopy was noticed during 1950's when Hopkins developed solid rod lens with proximal cold light source. In the latter part of twentieth century sinonasal endoscopy has been established as an important component in our diagnostic and therapeutic armamentarium<sup>2</sup>.

The pioneering work of Prof Walter Messerklinger of Graz, Austria on sinus mucosa and mucociliary transport has brought light into the understanding the pathophysiology of sinus diseases. This can be summarized as below:

1. Most PNS infections spread from nose to sinus.
2. Recurrent sinusitis is secondary to insufficient outflow or obstruction of the natural sinus ostia into the nasal cavity.
3. Sites of obstruction or partial stenosis are the ethmoid infundibulum at the entrance to the maxillary and frontal sinus<sup>3,4</sup>.

This work of Messerklinger has been appreciated and accepted. The earlier concept that frontal and maxillary sinuses are the culprits for chronicity of the disease is no longer accepted. This point was again confirmed by the introduction of CT-scan.

Modern endoscopic sinus surgery is arbitrarily divided into Messerklinger and Wigand approaches. The Messerklinger approach (1985) is ideal for patients with anterior ethmoid disease with or without maxillary or frontal sinus disease. Here the approach is from anterior to posterior. It can be extended to the posterior ethmoids, sphenoid and frontal sinus, if necessary. The Wigand approach (1978) is in contrast, ideal for patients with pansinusitis who may not respond to limited surgery. This approach is from posterior to anterior, and routinely involves clearance of all the sinuses<sup>5</sup>. Both techniques are based on the assumption that the sinus mucosa is reversibly diseased and will return to normal once adequate drainage has been established. FESS has gained popularity and continues to do so among the ENT surgeons in the recent years with the better understanding of the lateral wall of the nose. Chronic rhinosinusitis is one of the most frequent otolaryngologic diseases encountered in routine ENT practice. The diagnosis of chronic rhinosinusitis is made by a variety of physicians including primary care physicians, general-physicians, pediatricians, pulmonologists and otolaryngologists. Chronic rhinosinusitis significantly impacts the quality of life by interfering with the general health, vitality and social functioning and cause decrease in productivity in the work force, which is comparable with that observed in patients with coronary heart disease and chronic lung disease. Chronic rhinosinusitis is one of the commonest conditions for which antibiotics are prescribed. Most cases of chronic rhinosinusitis respond to medical treatment but if no improvement in symptoms is achieved, FESS advocates systematic approach to the surgical treatment of the disease of the nose and sinuses<sup>6,7</sup>.

### **Objectives**

To compare the symptomatic profile of Chronic Rhinosinusitis before and after FESS by SNOT-20 questionnaire.

### **Review of Literature**

According to Draf<sup>1</sup>, Hirschmann performed the first attempts at nasal and sinus endoscopy in 1907 using a modified cystoscope. In 1925 Maltz, a New York rhinologist coined the term sinuscopy and advocated the technique for diagnosis of rhinosinusitis. In 1978, Messerklinger published the first systematic and detailed work documenting endoscopic findings in English. Messerklinger noted that wherever two mucosal layers came in contact, localized disruption of mucociliary clearance occurs causing retention of secretions in the area of contact, and thus creating increased potential for infection even in the absence of ostial closure. Anatomically, areas of mucociliary contact are most likely to occur in the narrow mucosa-lined channels of the middle meatus and the ethmoid air cell system. Messerklinger identified ventilatory defects in the middle meatus & anterior ethmoidal cells in patients with chronic and recurring sinus

infections. These areas of persistent mucosal contact occurred either as a result of mucosal inflammation and hyperplasia following an infection, or as a result of an anatomic malformation. In majority of cases, infection spreads from the ethmoids to secondarily affect the maxillary and frontal sinuses. So even severe mucosal diseases in the maxillary and frontal sinuses, which in the past had often been considered irreversible, usually resolved when normal ventilation and mucociliary clearance was restored and ethmoid disease was eradicated<sup>8, 9</sup>. After FESS, 14 patients had minor complications, the most common complication being synechiae, between middle turbinate and septum in 6 patients. 83 patients had significant improvement after FESS while 10 had one episode of sinusitis postoperatively. The results of this series suggest that FESS is an efficacious advancement in treatment of sinusitis<sup>10</sup>. Nayak et al (1991) studied a group of 78 patients (30 unilateral disease & 48 bilateral disease) between 12 to 57 yrs with chronic sinusitis over a period of 16 months with various nasal complaints, the commonest complaint being nasal discharge (27 unilateral, 34 bilateral), followed by headache (26 unilateral, 33 bilateral) and nasal obstruction (21 unilateral, 38 bilateral), with a range of duration of symptoms being 3 months to 30 yrs. All except 3 of these patients were subjected to FESS under local anesthesia. 47 of these patients had total relief, 12 had partial relief and 7 had no relief. 12 patients were lost for follow up. 6 patients had recurrence and were taken up for a second procedure. There were no complications reported<sup>11, 12</sup>.

### Material and methods

An Observational Prospective study was conducted among patients, Patients attending ENT Out Patient Department (n=40) at All india institute of medical sciences, Bhubneshwar. Study duration of Two years. with clinical features and investigations suggestive of CRS were randomly selected after applying the following inclusion and exclusion criteria:

#### Inclusion Criteria

Age above 18 years

Established diagnostic criteria of chronic rhinosinusitis as per Task Force of the American Academy of Otolaryngology guidelines. Refractory to medical treatment Associated with or without nasal polyposis

#### Exclusion Criteria

Patients with diseases like cystic fibrosis, primary ciliary dyskinesia, immune deficiencies, Patients who have undergone previous nasal surgeries

Pregnancy, Patients with bleeding disorders, Asthma cases, acute sinusitis, fungal sinusitis, orbital complication cases.

Patients with at least two major, or one major and two minor criteria/sinus symptoms were considered. After obtaining consent for the study patients were explained and given SNOT-20 questionnaire proforma to fill and scores were noted preoperatively and the degree of disease was graded as per the SNOT-20 questionnaire. The patients were classified into Mild Disease with scores 11 – 20, Moderate Disease with scores 21 – 40, Moderately Severe Disease with scores 41-70, Severe with scores 70 – 100.

External nasal profile: for presence of any nasal deformity or inflammation. Sinus tenderness.

#### Oral Cavity & Oropharynx

Buccal mucosa, tongue and dentition examination. Anterior pillars and tonsil examination.

Posterior pharyngeal wall examined for evidence of postnasal drip or chronic granular changes.

**Ear**

Post auricular-area and pinna examined for any operative scar or mastoid tenderness. External auditory canal examined for the presence of any wax/debris/discharge.

**Results**

40 patients were examined in the study using the above methodology. Average age was 42.95 years, the range being 18 to 76 years

**Table 1: Descriptive statistics for age**

Mean	42.95
SD	15.39
Min-Max	18-76

**Table 2: Age Distribution**

Age	Number	Percent
18-30	9	22.5
31-50	20	50
51-70	8	20
>70	3	7.5

**Table 3: Gender distribution**

	Number of Cases	Percentage
Male	29	73%
Female	11	27%
Total	40	

**Table 4: Duration of symptoms**

Duration of Symptoms	Number	Percentage
3M-1Y	14	35
1Y-3Y	10	25
>3Y	16	40

**Table 5:**

Mean	3
SD	2.61
Min-Max	3 months – 12years
Median	2 Years

In our study, we found that 2.5% (1) patient had diabetes, 17.5% (7) patients had Hypertension and 17.5% (7) patients were with both Diabetes and Hypertension. Remaining 62.5% (25) patients were normal.

**Table 6: Association with Smoking**

	Number of Cases	Percentage
Yes	14	35%
No	26	65%
Total	40	

**Table 7: Association with Polyp**

Disease	Number	Percentage
Sinusitis with Bilateral Polyp	23	57.5
Sinusitis with Unilateral Polyp	1	2.5
Sinusitis without Polyp	16	40

In this study 57.5% (23) patients had Sinusitis with bilateral Polyp, 2.5%(1) patients had Sinusitis with unilateral Polyp and 40% (16) patients were with without Polyp. In this study Baseline SNOT- 20 questionnaire grouped 83% patients [33] as Moderately Severe, 12% patients [5] as Severe and 5% patients [2] as Moderate Disease. At 1 week Postoperatively 45% patients [18] were Moderate Disease and 55% patients[22] were Moderately Severe

**Table 8: PostOp 1 month Degree of disease association**

		1 Month			Total	P-Value
		Mild	Moderate Disease	Moderately Severe		
Baseline	Moderate	2	0	0	2 (5%)	0.317
	Moderately Severe	11	20	2	33 (83%)	
	Severe	1	4	0	5 (12%)	
Total		14 (35%)	24 (60%)	2 (5%)	40	

At the end of One month 35% patients [14] had Mild Disease, 60% [24] had Moderate Disease and 5% [2] had Moderately Severe disease.

**Table 9: PostOp 6 months Degree of disease association**

		6 Month			Total	P-Value
		Mild	Moderate Disease	No disease		
Baseline	Moderate	0	0	2	2 (5%)	0.247
	Moderately Severe	6	3	24	33 (83%)	
	Severe	3	0	2	5 (12%)	
Total		9 (23%)	3 (7%)	28 (70%)	40	

Finally at 6 months Post operatively, 23% [9] patients were Mild, 7% [3] patients were Moderate and 70% patients [28] were No disease.

## Discussion

Chronic Rhinosinusitis is one of the most common diseases in many parts of the world including India. Since CRS is a disease with rising prevalence that costs society billions of rupees and affects a significant portion of the population, the evaluation of disease, and verification of the therapy-effectiveness are essential<sup>13</sup>. The present study is focused on the interaction between the symptom profile of patients before and after FESS using SNOT 20 questionnaire. The most important part of evaluation remains history with pre-op SNOT-20

score. In this prospective study we found that 93% patients with symptomatic CRS refractory to medical management had significant improvement (No disease, Mild disease) in the overall symptom score after FESS attempt at 6 months followup. These findings are consistent with those of the other series. The study revealed that after 6 months of follow-up, the total SNOT-20 score of patients was significantly decreased from the baseline ( $p < 0.001$ ). Our results are consistent with those of other studies, which have shown 75 % to 92 % postoperative improvement after FESS<sup>14</sup> Nasser A Fageeh in a study of 129 patients with CRS showed that the commonest complaint was nasal obstruction (76%), followed by headache (74.4%), anosmia (56.5%), & facial pressure/pain (50%). Postoperatively, patients were followed up for at least 6 months. The most significant improvement was noticed in patients with nasal obstruction (60%). The least improvement occurred in patients with anosmia (40%). All the symptoms were assessed pre and postoperatively according to the severity of their symptoms by allotting grades. 85.1 % of the patients had a favorable opinion of the procedure and would recommend it to others with similar problems<sup>15</sup>. Jakobsen J and Svendstrup F (2000) conducted a prospective study on 237 consecutive patients suffering from chronic sinusitis and/or nasal polyposis. Nasal obstruction was the most frequent symptom (61%) followed by purulent nasal discharge, anosmia, frontal pain, headache and maxillary pain. Duration of symptoms averaged 9.3 years. At the end of 1 year follow up, 45% were totally satisfied with the results and were symptom-free, and 44% more definitely feeling better<sup>16</sup>. Damm M et al (2002) conducted a study on patients with CRS to assess the impact of FESS on the symptom profile. Leading symptoms of CRS were nasal obstruction (92%) and postnasal drip (87%). Furthermore, patients reported dry upper respiratory tract syndrome in 68%, hyposmia in 66%, headache in 64% and asthmatic complaints in 34%. After a mean postoperative follow-up of 31.7 months, an improvement in quality of life was achieved in 85%, no change in 12%, and deterioration in 3%. All symptoms  $p < 0.01$ ). Hence, it was concluded that symptoms improved in excellent fashion by FESS in majority of the patients, achieving better quality of life in the long term<sup>17</sup>. In our study, at the end of 6 months post operatively 70% patients were of No Disease, 23% patients were of Mild Disease and 7% were of Moderate Disease. A survey of symptoms and quality of life was conducted using Sino-nasal Outcome Test-20 (SNOT-20) questionnaire with 76 patients before and after endoscopic sinus surgery by Zhong Zhuqing in 2012. The overall effect of endoscopic sinus surgery on CRS was subjectively self- evaluated by patient. The study revealed that after 6 months of follow-up, the total SNOT-20 score of patients was significantly decreased from the baseline ( $p < 0.001$ ). The most important 5- items were found to be “thick nasal discharge”, “need to blow nose”, “dizziness”, “frontal pain”, and “lack of a good sleep”. Other items, related to sleep and emotion, were also significantly improved: the proportion of responses of “much improved”, “improved” and “no-improved” were 56.3%, 33.3%, 10.4%, respectively<sup>18</sup>. The symptomatic improvement after FESS in our study was nearly similar to the one conducted by Zhong Zhuqing. In the pre operative work up of our study, 23 patients (57.5 %) revealed bilateral nasal polyps, 1 patient (2.5%) had unilateral nasal polyp on diagnostic nasoendoscopy. FESS is an effective and safe procedure when performed by surgeons experienced in the technique. In inexperienced hands, the major complications associated with FESS can include intracerebral hemorrhage, CSF leak, diplopia, blindness, intracranial penetration, meningitis and severe nasal hemorrhage. In our study, there were no major complications recorded.

## Conclusion

FESS is an excellent method of treatment for CRS. SNOT-20 questionnaire is the best scoring system to assess the degree and quality of life. Mean SNOT-20 score at the end of 6 months

was 10.75 [ $p < 0.001$ ]. At the end of Post-op 6 months 70% were of No Disease and 23% were of Mild Disease. We advocate that patient symptomatology and clinical assessment should be given due importance for decision making before subjecting a patient to FESS.

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