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RESEARCH ARTICLE

“SYMPTOMATIC OUTCOME IN CHRONIC RHINOSINUSITIS PATIENTS AFTER ENDOSCOPIC SINUS SURGERY - A PROSPECTIVE OBSERVATIONAL STUDY”

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Abstract

Chronic rhinosinusitis (CRS) is an inflammation of the nose and paranasal sinuses that is frequent. Endoscopic sinus surgery (ESS) is commonly used to treat intractable CRS cases. Although the effect of ESS on CRS symptoms has been researched, the pattern of symptom relief after ESS for CRS remains unknown. The purpose of this study was to investigate the extent and order of symptom improvement following ESS for CRS. This was a long-term prospective study of 54 CRS patients. The Sino-nasal Outcome Test- 22 (SNOT-22) questionnaire was utilised for assessment at five periods throughout the study: pre-ESS, one week after ESS, one month, three months, and six months after ESS. The following differences in mean scores were seen between pre-ESS and 6 months post-ESS for the five SNOT-22 domains: rhinologic symptoms, extra-nasal rhinologic symptoms, ear/facial symptoms, psychological dysfunction, and sleep dysfunction (p -value = 0.001). Understanding the pattern of symptom improvement after ESS for CRS will benefit in patient counselling and the optimisation of current treatment protocols in order to maximise surgical results and quality of life.

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Introduction:-

In India, 1 in 8 people, or between 5 and 15% of the urban population, suffer from chronic rhinosinusitis (CRS). There have been reports that sinusitis has a higher prevalence than any other chronic condition (146/1000 people), and it is apparently getting more common. [1] CRS is distinguished by nasal blockage/obstruction/congestion, nasal discharge, facial pain, and/or a loss of smell, at the very least. Despite having low mortality rates, it significantly impacts patients' quality of life and health-related quality of life. [2] Similar to patients with coronary heart disease and chronic lung disease, people with chronic rhinosinusitis experience significant impairments in their overall health, vitality, and ability to function in social situations. They also experience a decline in their productivity at work. [3]

Appropriate CRS care aims to significantly improve the patient's health while reducing symptoms [4]. Pharmacological therapy is the main method for achieving these goals. Endoscopic sinus surgery (ESS) is recommended [4,5] however, in cases of intractable CRS with no improvement in symptoms. It has taken decades to create an all-encompassing, accepted method of treating CRS [6]. The permeability and functionality of the nasal sinus passages are restored by ESS, a precisely targeted intervention. As a result, the sinuses on the face are properly ventilated and drained [7]. No study has looked at the pattern of symptom improvement following ESS for CRS,

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even though few studies have looked at the impact of ESS on CRS symptoms and quality of life after surgery. As a result, this study aimed to identify the degree and chronology of symptom relief after ESS for CRS, as well as to highlight potential preoperative elements that influence surgical outcomes in CRS patients.

Materials and Methodology:-

The Government Medical College's institutional review board in Kota, Rajasthan, approved this study. Before enrolling in the study, participants were required to provide written consent. This was a prospective cohort study that took place in the first six months following ESS. We enrolled patients who visited the specialized Rhinology Clinics of the Otolaryngology Department at Govt. Medical College and Hospital, Kota, Rajasthan, and were diagnosed with CRS in accordance with the American Academy of Otolaryngology recommendations [8]. Only patients with refractory CRS (despite receiving medical treatment for at least 12 weeks) who underwent bilateral ESS from August 2019 to September 2021, associated with or without nasal polyposis, and aged 18 to 60 years were followed up for 6 months after surgery. Patients with cystic fibrosis, primary ciliary dyskinesia, and immunological deficiencies, patients who have had previous nasal surgeries, pregnancy, patients with bleeding disorders, fungal sinusitis, and cases of ocular complication. The detailed history of each participant was obtained and a nasal endoscopic examination was performed on each participant, followed by confirmatory computed tomography scans, which were scored using the Lund-Mackay scoring system [9].

Patients were recruited to the study protocol after meeting the inclusion and exclusion criteria. Preoperatively, patients were examined for signs and symptoms using diagnostic nasal endoscopy and a computed tomography scan of the paranasal sinuses. The SNOT-22 questionnaire (Table 1) was used to assess the patient's symptoms prior to surgery. The Messerklinger approach was used to perform FESS on all of the patients [10]. The SNOT-22 questionnaire was used to score all patients' symptoms after surgery at 1-week, 2-week, 1-month, 3-month, and 6-month follow-ups.

Result:-

A total of 54 participants met the inclusion criteria and were eligible to be enrolled in the study, and completed the follow-up questionnaires for the entire study period. The mean age of the participants was 36.7 ± 19.54 years among them 33 were male and 24 were female.

Table 1:- Demographic data.

Parameter	Value
Age	36.7 ± 19.54
Gender Male	33 (61.11%)
Female	24 (38.89%)
CT score	13.5 ± 5.89

As shown in table 2, symptoms either improved fully, somewhat, or exhibited no change (i.e., the baseline preoperative score stayed the same 6 months after surgery). Need to blow nose, nasal blockage, sneezing, runny nose, and reduced sense of smell/taste got the highest mean ratings. These symptoms, however, considerably improved to a 'very mild condition' in Table 2. The following are the distributions of the SNOT-22 items 6 months after surgery: need to blow nose ($p = 0.001$), nasal blockage ($p = 0.001$), sneezing ($p = 0.001$), runny nose ($p = 0.001$), and reduced perception of smell/taste ($p = 0.001$). The median score for post-nasal discharge, a well-known annoying symptom of CRS, did not alter after surgery ($p = 0.001$). The Wilcoxon sign rank test findings show the difference in the mean of the SNOT-22 items before and after surgery (Table 2).

Table 2:- Comparison of SNOT – 22 score within the time frame of 6 month.

Item	Pre-operative	1 week	1 month	3 months	6 months	P value
Need to blow nose	2.96 ± 0.68	2.87 ± 1.32	2.11 ± 0.71	1.81 ± 0.79	1.47 ± 0.98	<0.001
Nasal blockage	3.31 ± 0.71	2.78 ± 1.10	2.02 ± 0.98	1.58 ± 0.64	1.23 ± 0.94	<0.001
Sneezing	3.1 ± 0.81	2.61 ± 0.94	2.09 ± 0.82	1.78 ± 0.74	1.21 ± 0.68	<0.001
Runny nose	2.97 ± 0.96	2.21 ± 0.84	1.88 ± 0.97	1.42 ± 0.67	1.09 ± 1.33	<0.001
Cough	2.10 ± 0.88	2.01 ± 0.96	1.94 ± 0.98	1.53 ± 1.01	1.03 ± 1.16	<0.001
Post-nasal discharge	2.06 ± 0.86	2.4 ± 1.2	2.9 ± 1.34	2.7 ± 1.2	2.9 ± 1.90	0.84
Thick discharge	2.78 ± 0.98	2.48 ± 0.91	2.01 ± 1.03	1.9 ± 0.96	1.92 ± 1.78	<0.001

Ear fullness	2.22 ± 0.86	2.02 ± 0.97	1.98 ± 1.1	1.84 ± 1.14	1.90 ± 1.36	<0.001
Dizziness	1.34 ± 0.91	1.25 ± 0.98	1.11 ± 0.92	0.94 ± 1.04	0.84 ± 1.31	<0.001
Ear pain	1.64 ± 0.61	1.58 ± 0.79	1.44 ± 0.94	1.04 ± 0.99	0.88 ± 1.36	<0.001
Facial pain/pressure	0.88 ± 1.66	0.9 ± 1.72	1.02 ± 1.6	1.30 ± 1.	1.59 ± 1.84	<0.001
Decreased sense of smell/taste	3.43 ± 1.02	3.1 ± 1.12	2.86 ± 1.04	2.1 ± 1.44	1.69 ± 1.67	<0.001
Difficulty falling asleep	2.52 ± 0.71	2.31 ± 1.04	1.94 ± 1.4	1.51 ± 1.2	0.89 ± 1.25	<0.001
Wake up at night	1.60 ± 0.98	1.51 ± 0.88	0.97 ± 0.99	0.84 ± 0.94	0.59 ± 1.01	<0.001
Lack of a good night's sleep	2.1 ± 0.9	1.84 ± 0.87	1.67 ± 0.68	1.12 ± 1.04	0.79 ± 1.1	<0.001
Wake up tired	0.75 ± 0.90	0.74 ± 0.94	0.69 ± 1.02	0.69 ± 1.02	0.70 ± 1.14	0.32
Fatigue	0.85 ± 1.16	0.84 ± 1.14	0.83 ± 1.11	0.83 ± 1.11	0.81 ± 1.16	0.21
Reduced productivity	0.70 ± 0.84	0.70 ± 0.84	0.66 ± 0.94	0.6 ± 0.95	0.55 ± 1.09	0.067
Reduced concentration	0.64 ± 1.05	0.67 ± 1.1	0.71 ± 1.2	0.88 ± 1.4	1.29 ± 1.52	<0.001
Frustrated/restless/irritable	1.24 ± 0.94	1.02 ± 0.68	0.98 ± 0.88	0.73 ± 0.99	0.53 ± 1.24	<0.001
Sad	0.49 ± 1.2	0.50 ± 0.94	0.55 ± 1.02	0.62 ± 1.1	0.86 ± 1.3	0.33
Embarrassed	0.36 ± 1.14	0.39 ± 1.02	0.42 ± 0.99	0.51 ± 1.08	0.59 ± 1.24	0.08

Discussion:-

The purpose of this study was to investigate the efficacy of ESS in CRS patients during the 6-month postoperative period before they were discharged from the clinic. The nasal mucosa would have healed by the end of this period, and sinus function would have been restored. CRS symptoms can have a major impact on one's quality of life. ESS is an alternative therapeutic method for treating rhinological symptoms in circumstances where medical treatment has not improved the symptoms. Nonetheless, there have been questions about its efficacy [7,9].

Nasal blockage, sneezing, runny nose, thick nasal discharge, and a diminished sense of smell/ taste all improved significantly in the first month. This shows that surgical therapy restored patency to the nasal cavity and sinus drainage system, which were previously occluded by illness. Furthermore, most of the symptoms associated with sleep dysfunction, such as a lack of a good night's sleep and difficulties falling asleep, were alleviated, and patients experienced less interrupted and disturbed sleep.

Some symptoms, such as nasal blockage, runny nose, sneezing, thick nasal discharge, and dizziness, continued to progress with a declining slope (as depicted in the line graph) in the sixth month. In reality, these symptoms vanished totally, and a median score of 0 was assigned to them. Symptoms such as cough and post-nasal discharge, on the other hand, persisted despite surgical surgery. Bhattacharyya et al. [11] found a significant reduction in all major CRS symptoms with a large effect size, with the exception of hyposmia, which had a modest effect size. However, in that trial, the stated sequence of symptom improvement began with face pressure, nasal obstruction, congestion, rhinorrhea, and hyposmia improvement [12].

DeConde et al. compared the improvement in CRS symptoms after medical treatment to the improvement in CRS symptoms following surgical treatment [13], and discovered that surgical management with ESS improves all main symptoms except olfaction three to four times better than medical treatment [14]. Many studies have found that the perceptions of smell and taste do not improve following surgery; in fact, it can take up to 9.7 years on average to fully recover. This is due to the position of the olfactory system, which might be affected by the disease process or surgical injuries [15]. A multi-institutional cohort research found that the percentage of patients who had their olfactory sense restored following surgery was lower than the number of patients who did not [4].

According to prior research, minor complaints have a moderate effect change after surgery, whereas weariness has a big effect change [11]. The findings of our study revealed similar patterns. Fatigue improved significantly postoperatively, dropping to a median score of 0. The reduction in fatigue following surgery suggests that ESS not only affects the head and neck regions, but also has a systemic effect, resulting in a significant improvement in quality of life [11].

Cough, according to researchers, is connected with slower postoperative recovery. A probable reason is that the presence of asthma or laryngopharyngeal reflux may elicit cough even in the absence of CRS [16]. The current investigation found a considerable reduction in the ear and face domains. This is consistent with the findings of Stoikes et al. [17], who found that improvement in CRS symptoms after ESS is linked to a disruption in normal mucociliary clearance in the nasopharynx tube. In the current study, the mean preoperative global SNOT-22 score was 42.6; this score reduced to 28 at the first postoperative visit and 21.08 at the last postoperative appointment. Our findings are similar to those of the Hopkins et al. study, which was the first to use the SNOT-22 score. The mean preoperative score in that research was 41.7, whereas the mean postoperative score was 25.5 [14]. A second postoperative visit, however, was not included in that study.

This study looked at the immediate and moderate postoperative effects of ESS, with the goal of providing a more detailed description of how each symptom improved and highlighting how choosing a more aggressive intervention can have a positive impact on patients' symptoms and quality of life. The current study contributes to a better understanding of the underlying elements that affect physicians in selecting ESS as a therapeutic choice or an alternate option to medical therapy by studying the detailed improvement of CRS symptoms following sinus surgery. These surgical intervention consequences are to be anticipated. Given the chronic nature of CRS, it is advised that further research into the long-term improvement of each symptom utilizing the SNOT-22 domain scores be conducted to aid in the right development of optimal therapy regimens.

Despite the fact that this is a single-centre study, which is a drawback of our design. A major disadvantage of our investigation is the limited sample size associated with an observational study design.

Conclusion:-

ESS improves CRS symptoms to varied degrees and rates during the six-month period following surgery. Understanding the pattern of symptom improvement following ESS for CRS will aid patient counselling regarding treatment modalities, expected outcomes, and associated predictive factors, providing a strong incentive to optimize current treatment protocols and maximize ESS outcomes and quality of life.

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