



VARIOUS FACTORS CONTRIBUTING TO FAILURE OF MEDICAL MANAGEMENT IN CHRONIC RHINOSINUSITIS: A PROSPECTIVE OBSERVATIONAL STUDY

Otorhinolaryngology

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ABSTRACT

Background: Chronic rhinosinusitis (CRS) is a common inflammatory disease of the nose and paranasal sinuses that significantly affects patients' quality of life. Although maximal medical therapy is the first-line treatment, a considerable proportion of patients fail to respond and require surgical intervention. This study aimed to evaluate the factors contributing to failure of medical management in patients with CRS. **Methods:** This prospective observational study was conducted at a tertiary care center over a period of two years. 61 patients diagnosed with CRS were included and initially managed with standardized maximal medical therapy. Patients who did not respond adequately were subsequently treated surgically. Subjective outcomes were assessed using the Sinonasal Outcome Test-22 (SNOT-22), while objective assessment was performed using the Modified Lund-Kennedy (MLK) endoscopic scoring system. **Results:** Of the 61 patients, 43 (70.5%) had CRS without nasal polyps and 18 (29.5%) had CRS with nasal polyps. Anatomical variations were the most common etiological factor associated with CRS. Failure of medical management was significantly higher in patients with anatomical obstruction and associated comorbidities. These patients demonstrated significant improvement in both SNOT-22 and MLK scores following surgical intervention. **Conclusions:** Failure of medical management in chronic rhinosinusitis is strongly associated with underlying anatomical factors and comorbid conditions. While maximal medical therapy should be initiated in all patients, early surgical intervention should be considered in refractory cases, particularly in the presence of anatomical obstruction, to achieve better symptomatic and endoscopic outcomes.

KEYWORDS

Chronic rhinosinusitis, Medical management, Surgical management, Nasal polyps.

INTRODUCTION

According to the European Position Paper on Rhinosinusitis and Nasal Polyps, CRS is defined by the inflammation of the nose and paranasal sinuses characterized by the presence of two or more symptoms for ≥ 12 weeks, one of which should be either nasal blockage/obstruction/congestion or nasal discharge (anterior/posterior nasal drip), with or without facial pain/pressure and/or reduction or loss of smell, and supported by objective evidence of disease on nasal endoscopy and/or CT scan^[1]. It represents a significant health problem and is associated with considerable morbidity and impaired quality of life.

CRS may present either with nasal polyposis (CRSwNP) or without nasal polyposis (CRSSNP). Current treatment protocols recommend aggressive medical management as the first line of treatment, with surgical intervention reserved for patients who fail to respond to medical therapy^[2,3].

Identification of factors contributing to failure of medical management is essential to guide timely surgical intervention. The present study was undertaken to evaluate factors responsible for failure of medical management in CRS and to assess outcomes of medical and surgical treatment using validated subjective and objective assessment tools.

METHODS

This prospective observational study was carried out at a tertiary care centre over a period of two years. Patients aged >15 years with a clinical and endoscopic diagnosis of chronic rhinosinusitis were included in the study. Patients with complications of CRS, fungal rhinosinusitis, sinonasal malignancy, and those who had undergone previous sinonasal surgery were excluded.

Institutional Ethics Committee approval was obtained prior to commencement of the study. Based on diagnostic nasal endoscopy, patients were classified into two groups: CRS with nasal polyps (CRSwNP) and CRS without nasal polyps (CRSSNP). All patients were initially subjected to medical therapy comprising tablet azithromycin 500 mg BD for 14 days, tablet levocetirizine (5 mg)+montelukast (10 mg) HS for 3 weeks, mometasone nasal spray 1 puff OD for 3 weeks and saline nasal douches BD for 3 weeks. In patients with partial relief, tablet azithromycin was continued for 1 week more. Those with history of allergy were asked to avoid common allergens. Patients were counselled regarding correct method of nasal spray delivery and compliance.

Subjective improvement was assessed using the SNOT-22 score, and objective improvement was assessed using the modified Lund-Kennedy endoscopic score. Improvement of more than 60% in scores was considered significant. Patients who failed medical management were subjected to appropriate surgical intervention, including septal correction and functional endoscopic sinus surgery based on endoscopic and radiological findings, followed by continued postoperative medical therapy. Statistical analysis was done using the SPSS software. The improvements in LK endoscopy scores and SNOT-22 scores for medical management and combined management in patients with anatomical variations were compared.

RESULTS

A total of 61 patients diagnosed with chronic rhinosinusitis were included in the study. Of these, 43 patients (70.5%) were diagnosed with chronic rhinosinusitis without nasal polyps (CRSSNP), while 18 patients (29.5%) had chronic rhinosinusitis with nasal polyps (CRSwNP). Thus, CRSSNP constituted the majority of cases in the present study population. The majority of patients belonged to the 20–40-year age group. A male predominance was observed across most age groups. Anatomical factors were the most common etiological association, seen in 25 (40.98%) patients, either alone or in combination with other factors. Allergy was the second most common etiological factor, followed by infection. A proportion of patients exhibited combined etiologies, most frequently a combination of anatomical factors with allergy or infection, highlighting the multifactorial nature of chronic rhinosinusitis. The maxillary sinus was the most commonly involved sinus, followed by the ethmoid sinus.

Diagnostic nasal endoscopy and computed tomography of the paranasal sinuses revealed various anatomical variations. Deviated nasal septum was the most frequently observed abnormality, seen in 16 (64%) patients, followed by concha bullosa, paradoxical middle turbinate, and enlarged bulla ethmoidalis, pneumatized uncinate process, Haller cells, agger nasi cells, and accessory ostium. (TABLE 1)

Table 1: Significant Anatomic Variations Seen On CT PNS

Sr. No.	Anatomic Variations	No. Of Patients (%)
1	DNS	10 (40.00%)
2	CONCHA BULLOSA	6 (24.00%)

3	DNS+ CONCHA BULLOSA	3 (12.00%)
4	PARADOXICAL MIDDLE TURBINATE	1 (4.00%)
5	DNS + PARADOXICAL MIDDLE TURBINATE + ENLARGED BULLA ETHMOIDALIS	2 (8.00%)
6	ENLARGED BULLA ETHMOIDALIS	1 (4.00%)
7	DNS + AGGER NASI CELLS	1 (4.00%)
8	TYPE 4 FRONTOETHMOID CELL	1 (4.00%)

Following medical therapy, a greater proportion of patients with CRSsNP demonstrated significant subjective and objective improvement compared to patients with CRSwNP.

Patients who failed medical management subsequently underwent appropriate surgical intervention based on endoscopic and radiological findings.

According to improvement after medical treatment these patients were grouped into 4 groups, A, B, C, D. (TABLE 2)

Table 2: Division Of Patients According To Their Diagnosis And Treatment Received

CRS Type	Category Of Patients Included	No. Of Patients (%)
CRSwNP (GROUP A)	MEDICAL MANAGEMENT ONLY	2 (3.30%)
CRSwNP (GROUP B)	MEDICAL AND SURGICAL MANAGEMENT	16 (26.21%)
CRSsNP (GROUP C)	MEDICAL MANAGEMENT ONLY	29 (47.54%)
CRSsNP (GROUP D)	MEDICAL AND SURGICAL MANAGEMENT	14(22.95%)

Postoperative assessment revealed marked improvement in both SNOT-22 and modified Lund–Kennedy scores. Out of 61 patients, 25 patients who had anatomical variations their MLK score mean and SNOT 22 score mean was calculated pre medical management, post medical management and post surgical management. (TABLE 3)

Table 3: MLK Endoscopy Score And Snot 22 Score Mean – Pre And Post Medical Treatment In Patients With Anatomic Variations

Management	MLK Endoscopy Score Mean	SNOT 22 Score Mean
PRE MEDICAL MANAGEMENT	9	40.8
POST MEDICAL MANAGEMENT (PRE SURGICAL MANAGEMENT)	7.5	29.7
POST SURGICAL MANAGEMENT	2	7.6

This indicates that while medical treatment provides moderate symptom and endoscopic improvement, surgical management leads to substantial and more effective disease control and symptom relief in these patients with anatomical variations.

On comparing the improvements, post-surgical treatment resulted in a marked improvement, which was statistically significant, as p value <0.01 (TABLE 4)

Table 4: Comparison Of MLK Score And SNOT 22 Score Improvement After Different Treatment Modalities In Patients With Anatomic Variations

TREATMENT	LK ENDOSCOPY SCORE IMPROVEMENT (MEAN)	SNOT 22 SCORE IMPROVEMENT (MEAN)
POST MEDICAL TREATMENT	16.6%	25.2%
POST SURGICAL TREATMENT	73.3%	74.4%

Overall, patients with significant anatomical variations demonstrated a higher rate of medical treatment failure and benefited significantly from surgical intervention. Other factors associated with failure of medical management were presence of comorbidities, seen in 4 (13.3%) patients and compromised immune status seen in 2 (6.7%) patients.

DISCUSSION

Nasal polyps represent a more severe inflammatory phenotype of CRS, often associated with diffuse mucosal disease, impaired mucociliary clearance, and persistent edema, which limits penetration and effectiveness of topical and systemic medications. Patients with CRSsNP demonstrated a comparatively better response to medical management. However, a subset of CRSsNP patients failed to respond adequately to medical therapy, particularly those with significant anatomical obstruction. These findings emphasize that anatomical variations play an important role in disease persistence and treatment failure even in the absence of nasal polyps.

Anatomical factors were identified as the most common etiological association in this study. Deviated nasal septum was the most frequently observed abnormality, followed by concha bullosa, paradoxical middle turbinate, and other variations. This finding was consistent with studies by Aramani et al^[4], Surapanehi^[5], all of which reported septal deviation as the predominant finding. These anatomical abnormalities compromise ventilation and drainage of the paranasal sinuses. In such cases, medical therapy alone is often insufficient, as the underlying mechanical obstruction persists. Assessment using validated outcome measures such as SNOT-22^[6] and MLK^[7] scores provided an objective framework for evaluating treatment response.

The findings of the present study are in agreement with previous studies done by Tanvi et al^[8] and Mandava et al^[9] where anatomical factors were the most common finding in patients not responding to medical management.

Presence of comorbidities like asthma reinforces the role of systemic inflammatory conditions in influencing CRS treatment outcomes. The results from a study on comorbidity profile on CRS conducted by Chung SD in 2014^[10] in Taiwanese patients stated asthma to be a significant comorbidity.

However, this study has certain limitations. It was conducted at a single centre with a relatively small sample size, and long-term postoperative follow-up was not evaluated. Despite these limitations, the study provides valuable insight into real-world clinical factors contributing to failure of medical management in CRS.

CONCLUSION

In the present study, failure of medical management in chronic rhinosinusitis was strongly associated with anatomical variations. Compromised immune status, presence of co morbidities can also be considered as an associated factor. Additionally, improper medications intake can compromise the effectiveness of medical treatment of CRS. Treatment decisions should be tailored to individual patient characteristics to achieve optimal outcomes.

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