

# Chronic rhinosinusitis - Various contributing factors for failure of medical management

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## Abstract

**Background:** Chronic rhinosinusitis affects almost 20% of total population, impairing the quality of life and decreasing workplace productivity. Only 50% of the cases respond to medical management and rest of the patients do not respond. Our study is aimed to know various contributing factors for failure of medical management. **Methods:** This is a prospective observational study conducted in 50 patients with chronic rhinosinusitis who attended ENT OPD at Kamineni Institute of Medical Sciences, Narketpally from October 2020 – September 2021. All the patients were assessed clinically, endoscopically, radiologically, microbiologically and were given standard medical treatment. Based on response, patients were divided into two groups as Responders and Non responders. Factors present in non-responders were analyzed. **Results:** Of all the patients, 44% responded to medical management and 56% of patients had poor response. Our study showed that deviated nasal septum and fungal colonization were seen in 71.4% and osteomeatal blockage was seen 82.1% of non-responders. **Conclusion:** Incidence of Deviated nasal septum, presence of mucin, fungi and immune suppressed status were high in non-responders indicating them as important contributing factors for poor response to medical management.

**Keywords:** Chronic rhinosinusitis, Deviated nasal septum(DNS), Osteomatal complex, Mucin, Fungi, Immune status.

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## INTRODUCTION

Chronic rhinosinusitis is one of the common diseases encountered in ENT practice causing significant morbidity to the patients. It affects approximately 20% of the population and has significant impact on quality of life of these individuals.<sup>1</sup> Rhinosinusitis is defined as an inflammation of the mucous membrane that lines nose and paranasal sinuses and is defined as chronic rhinosinusitis, when the signs and symptoms last for more than 12 weeks.<sup>2</sup>

Fifty percent of patients with chronic rhinosinusitis respond to standard medical treatment.<sup>1</sup> Patients who do not respond undergo surgical management. Jeffrey D. Suh and David W. Kennedy<sup>3</sup> analyzed their patients and implicated various factors for failure of medical management, viz, Anatomical factors (Septal deviation, Concha bullosa, Haller cells), Microbiological factors (presence of fungus, biofilms), Genetic factors (Cystic fibrosis, Young syndrome, Samters triad), Infection from surrounding areas (Dental infections, GERD, Trauma, Foreign bodies), Immunological factors (Diabetes mellitus, HIV/AIDS, Organ transplant patients, Cancer chemotherapy), Environmental factors—Air pollution (smoking, exhaust fumes) and swimming. Literature search did not reveal any similar study conducted in our state to analyze factors that lead to failure of medical treatment in patients with chronic rhinosinusitis. Hence our study was designed to identify various factors contributing to failure of medical management in patients with chronic rhinosinusitis.

## PATIENTS AND METHODS

This is a Prospective observational study with sample size of 50 conducted in Department of Otorhinolaryngology and Head and Neck Surgery, Kamineni Institute of Medical Sciences, Narketpally from October 2020 – September 2021 Patients above the age of 15 years and below the age of 65years, with regular follow up and not on any steroids for last one month were included in to this study. Patients with complicated chronic rhinosinusitis, who have undergone paranasal sinus surgery previously, history of hypersensitivity to penicillin, presence of nasal polyposis and infection from surrounding areas were excluded from the study. All the patients were included into the study after taking proper informed consent and Institutional Ethics Committee Clearance. After taking detailed history from the patient and complete clinical

examination, all patients underwent Diagnostic nasal endoscopy and Non contrast computered tomography of nose and paranasal sinuses. During Diagnostic nasal endoscopy swab and nasal washings were collected for microbiological assessment for presence and type of fungus. Standard medical treatment with Antibiotic (Amoxicillin + Clavulanic acid), antihistaminics, Saline nasal spray and Duonase nasal spray were given to all the patients for 2weeks. Depending upon the response to treatment, patients were divided into two groups. Group A included patients with good response to medical management and Group B included patients with poor response to medical management. The data between two groups were compared using Mann Whitney test and significance was ascertained using p value.

## RESULTS

A total of 50 patients were included in to the study. Age distribution revealed that 54.4% in Group A and 50% in Group B were between 31 to 45 years. Most of the patients were males in both the groups accounting for 63.6% in Group A and 64.2% in group B.

**TABLE 1: COMPARISION OF NASAL ENDOSCOPIC FINDINGS**

DNE findings	Group A(22)	Group B(28)	Total (50)	Pvalue
DNS	8(36.3%)	20(71.4%)	28	(p<0.05)
Mucin	4(18.1%)	18(64.2%)	22	(p<0.05)
Middle turbinate hypertrophy	08(36.3%)	16(57.1%)	24	(p >0.05)
Inferior turbinate hypertrophy	6(27.2%)	12(42.8%)	18	(p>0.05)

Diagnostic Nasal endoscopy revealed that DNS was the most common finding in both groups with highest incidence in group B (71.4%), followed by Mucin (64.2%) and Middle turbinate hypertrophy (57.1%) as shown in Table 1. Among these, Deviated nasal septum and Mucin were high in non-responders comparatively and is significant statistically.

**TABLE 2: COMPARISION OF RADIOLOGICAL FINDINGS**

CT PNS findings	Group A(22)	Group B(28)	Total 50	Pvalue
DNS	8(36.3%)	20(71.4%)	28	(p<0.05)
conchabullosa	8(36.3%)	10(35.7%)	18	(p>0.05)
Haller cell	1(4.5%)	2(7%)	3	(p>0.05)
OMC blockage	10(45.4%)	23(82.1%)	33	(p<0.05)

Non Contrast Computered tomography of nose and paranasal sinuses showed osteo meatal block in 82.1% in group B vs 45.4% in group A and is statistically significant (p<0.05). Deviated nasal septum was seen in 71.4% in group B and in group A it was seen in 36.3%, and was statistically significant as shown in Table 2. In our study, Fungus was seen more in group B(71.4%) vs 45% in group A but was statistically insignificant. Immunocompromised status was 64.2% in group B and 18.1% in group A which is statistically significant (p <0.05) as shown in Table 3.

**Table 3: Division of patients according to contributing factors**

Contributing factors		Group A n = 22	Group B n =28	TOTAL NO OF PATIENTS n=50	Pvalue
Anatomical factors	single	14 (63.6%)	09 (40.9%)	23	P<0.05
	multiple	08 (36.3%)	19 (67.8%)	27	
Fungal organisms	present	10 (45.4%)	20 (71.4%)	30	P>0.05
	absent	12 (54.5%)	08 (28.5%)	20	
Immune status	competent	18 (81.8%)	10 (35.7%)	28	P<0.005
	supressed	4 (18.1%)	18 (64.2%)	22	

## DISCUSSION

Chronic rhinosinusitis being one of the common diseases encountered in ENT practice, it is important to know various etiological factors responsible for poor response to medical treatment to plan appropriate management. In our study, 28(56%) of patients had DNS. Dua, *et al.*<sup>4</sup> Asruddin, *et al.*<sup>5</sup> and Stallmann, *et al.*<sup>6</sup> found prevalence of 44%, 38% and 60% of DNS in their respective studies. Vinnakota Sriprakash<sup>7</sup> in his study found the incidence of DNS to be 30.9% in non-CRS patients, which clearly indicates that DNS is seen more in patients with CRS than in normal population. Hence possibly, DNS is a contributing factor for failure of medical management in all the above studies including our study, in which 71.4% of non-responders had DNS. In our study, Concha bullosa was seen in 35.7% of Group B patients and 36.3% in Group A where as in other studies by Stallmann, *et al.*<sup>6</sup> Maru, *et al.*<sup>8</sup> Wani, *et al.*<sup>9</sup> the

incidence of concha bullosa was 36%, 30%, 28% respectively in chronic rhinosinusitis patients. There was no statistical significance between Group A and Group B, in the incidence of Concha bullosa. The reason may be that in majority of the patients Conchabullosa, was well pneumatized and properly draining without obstructing the osteomeatal complex. Prevalence of fungus in group A was 45% and was 71.4% in group B in our study. The prevalence rate by the study conducted by Amin and Kakru<sup>11</sup> at Srinagar was found to be 30%, and by Chakraborty *et al.*<sup>11</sup> 42% at Chandigarh, Venugopal *et al.*<sup>14</sup> in Tamil Nadu 45%. In a Malaysian study<sup>12</sup>, the prevalence was found to be 26.7% and Braun *et al.*<sup>10</sup> in Europe, found that 75.5% of their specimens were positive for fungal elements. Fungus was detected more in group B which was not statistically significant, though numerically more. On analyzing the type of fungus, it was observed that there was difference in the type of fungus present in both the groups.

Type of fungus present in both the groups

Type of fungus	Group A(10)	Group B(20)	P value
Aspergillus flavus	7(70%)	4(20%)	P< 0.05
Aspergillus fumigatus	3(30%)	6(30%)	P>0.05
Aspergillus niger	1(1%)	10(50%)	P<0.05

50% of non-responders had *Aspergillus niger* and 70% of responders had *Aspergillus flavus* and these were statistically significant. This indicates that *Aspergillus niger* was probably responsible for poor response to medical management. While analyzing immune status, it was observed that, in Group B 64.3% were immunosuppressed. This indicates that immunstatus of patient was also an important factor contributing to failure of medical management.

## CONCLUSION

Our study emphasized that presence of Deviated nasal septum, Mucin, *Aspergillus niger* and compromised immune status contributed for failure of medical management in chronic rhinosinusitis

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