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# **Clinicomycological assessment of fungal sinusitis in patients with chronic rhinosinusitis in a tertiary care hospital: An observational study**

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**Abstract**---Background: Rhinosinusitis (RS) poses a major health problem, substantially affecting quality of life, productivity, and finances. Materials & methods: The study was conducted in the Department of Otorhinolaryngology, Adesh Institute of Medical Science and Research, Bathinda on admitted patients of chronic rhinosinusitis suspected with fungal sinusitis. The specimen obtained during surgery was sent for fungal culture. All the results were analyzed by Microsoft excel software. Results: Fungal sinusitis was present in 50 percent of the patients. Mean age of the patients belonged to the age group of 39.76 years. 58 percent of the patients were males while the remaining 42 percent of the patients were females. Nasal obstruction, nasal discharge and headache were present in 44 percent, 40 percent and 38 percent of the patients. *Aspergillus niger* and *Aspergillus fumigates* was present in 32 percent and 24 percent of the patients. Mucormycosis was present in 12 percent of the patients while *Candida albicans* was present in 14 percent of the patients respectively. Mean SNOT 22 score during preoperative, postoperative 1 week, postoperative 2 weeks, postoperative 3 weeks, postoperative 4 weeks, postoperative 6 weeks, postoperative 8 weeks, postoperative 10 weeks and postoperative 12 weeks was found to be 62.3, 31.1, 26.5, 21.2, 20.1, 18.5, 15.4, 12.3 and 10.8 respectively. While analysing statistically, a significantly reduction in mean SNOT 22 score during different follow-up intervals was seen. Conclusion: The prompt diagnosis of fungal rhinosinusitis especially aspergillosis and Mucormycosis is highly important due to the angioinvasive nature of the organisms.

**Keywords**---mucormycosis, invasive, rhinosinusitis, fungal sinusitis, endoscopic sinus surgery.

**Introduction**

In the BC era, Egyptians utilized fungus for making bread and wine. Ever since that time, fungus has been useful to man in different ways. From bread to alcohol, we need help of fungus. But along with it, the harmful effect it causes in our daily life cannot be ignored. Only a few of the fungi pathogenic for humans are sufficiently virulent to infect a healthy host. Most are relatively harmless unless they encounter an immunocompromised patient, in whom a weakened defense system permits them to invade the body. Under normal circumstances, the intact epithelial surfaces of the gastrointestinal tract will prohibit invasion by micro-organisms and the mucociliary barrier of the respiratory tract prevents aspiration of fungal cells and spores, while, in contrast, dead or damaged tissue may turn into a breeding ground for infection. For these reasons invasive fungal infections have to be ranked amongst the typically opportunistic infections.

Fungal infections are one of the four major microbiological sub-groups. Fungi can take two different forms. These are yeasts, which are unicellular organisms, and moulds, which are branching filamentous organisms and hence are more easily identified. Fungal infections of the paranasal sinuses are in fact a spectrum of diseases rather than one distinct entity. Fungal infection of the paranasal sinuses is a well-documented disease in the immuno-compromised patient, but recently many reports have indicated an increased prevalence in otherwise healthy individuals. Therefore, it results in great socioeconomic effects, including both direct and indirect costs to the society. Hence; the present study was conducted for assessing the clinical and mycological profile of fungal sinusitis in patients of chronic Rhinosinusitis. We also evaluated clinical profile (pre and post op symptoms) by Sino Nasal Outcome Test -22 scoring method

### **Material and methods**

Setting: Department of Otorhinolaryngology, Adesh Institute Of Medical Science And Research, Bathinda.

Duration: 1 Year from date of approval from research committee, AIMSRS, Bathinda and Ethics committee, Adesh University, Bathinda

Type of study: Observational study

Subjects: Admitted patients of chronic rhinosinusitis suspected with fungal sinusitis

### **Inclusion Criteria**

1. Age-group > 18 years
2. Both genders
3. Patients of chronic rhinosinusitis suspected with fungal sinusitis radiologically, undergoing surgery.

### **Exclusion Criteria**

1. Age-group < 18 years
2. Patients unwilling to comply with the study
3. Medically and surgically unfit patients
4. Patients diagnosed with underlying paranasal sinus malignancies

### **Results**

The present study was conducted in the Department of Oto-Rhino-Laryngology, Adesh Institute of Medical Science And Research, Bathinda, for assessing the clinical and mycological profile of fungal sinusitis in patients of chronic Rhinosinusitis. A total of 100 patients with presence of chronic sinusitis were analyzed. Out of these 100 patients, fungal sinusitis was present in 50 percent of the patients. 62 percent of the patients belonged to the age group of less than 41 years. Mean age of the patients belonged to the age group of 39.76 years. 58 percent of the patients were males while the remaining 42 percent of the patients were females.

Nasal obstruction, nasal discharge and headache were present in 44 percent, 40 percent and 38 percent of the patients. Facial pain and swelling over face was seen in 16 and 10 percent of the patients. In 46 percent of the patients, duration of symptoms was between one to five years while in 30 percent of the patients, the duration of symptoms was 6 to 10 years. In 48 percent of the patients, right side was involved while in 40 percent of the patients, left side was involved. Bilateral involvement occurred in 6 percent of the patients.

Diabetes mellitus and hypertension was found to be significant risk factors in 32 percent and 24 percent of the patients. Renal failure and prolonged use of topical steroids was found to be significant risk factor in 14 percent and 6 percent of the patients. On diagnostic nasal endoscopy findings, fungal debris was found to be present in 46 percent of the patients, while nasal polyp and mucosal discoloration was present in 28 percent and 26 percent of the patients respectively. *Aspergillus niger* and *Aspergillus fumigatus* was present in 32 percent and 24 percent of the patients. Mucormycosis was present in 12 percent of the patients while *Candida albicans* was present in 14 percent of the patients respectively. Combined *Aspergillus*, Mucormycosis and *Candida* were detected in 10 percent of the patients, while combine Mucormycosis and *Candida* were present in 8 percent of the patients.

KOH findings were positive in 90 percent of the patients. Mean SNOT 22 score during preoperative, postoperative 1 week, postoperative 2 weeks, postoperative 3 weeks, postoperative 4 weeks, postoperative 6 weeks, postoperative 8 weeks, postoperative 10 weeks and postoperative 12 weeks was found to be 62.3, 31.1, 26.5, 21.2, 20.1, 18.5, 15.4, 12.3 and 10.8 respectively. While analyzing statistically, a significantly reduction in mean SNOT 22 score during different follow-up intervals was seen. Oral antifungal agents were given in 88 percent of the patients while injectable anti-fungal agents were given in 12 percent of the patients.

## **Discussion**

Chronic sinusitis is a very common problem, and occurs even more frequently in people with allergies. A large number of people with chronic sinusitis are actually suffering from fungal sinus infections, which would not get better with typical antibiotics (Ferguson et al., 2000). Fungal infections of the sinuses have recently been blamed for causing most cases of chronic rhinosinusitis. Fungal infections of the paranasal sinuses are in fact a spectrum of diseases rather than one distinct entity. As such, there has been much published on the classification of fungal rhinosinusitis (FRS). Early classifications of FRS used the causative organism as the descriptor, i.e., aspergillosis, mucormycosis, etc.

Fungal rhinosinusitis (FRS) comprises a spectrum of disease processes, which vary in clinical presentation, histologic appearances, and biological significance. FRS can be acute (aggressive; symptoms <30 days), subacute (symptoms 30–90 days), and chronic (indolent; symptoms >90 days). 62 percent of the patients belonged to the age group of less than 41 years. Mean age of the patients belonged to the age group of 39.76 years.

- 58 percent of the patients were males while the remaining 42 percent of the patients were females.
- Nasal obstruction, nasal discharge and headache were present in 44 percent, 40 percent and 38 percent of the patients. Facial pain and swelling over face was seen in 16 and 10 percent of the patients.
- In 46 percent of the patients, duration of symptoms was between one to five years while in 30 percent of the patients, the duration of symptoms was 6 to 10 years.
- In 48 percent of the patients, right side was involved while in 40 percent of the patients, left side was involved. Bilateral involvement occurred in 6 percent of the patients.
- Diabetes mellitus and hypertension was found to be significant risk factors in 32 percent and 24 percent of the patients. Renal failure and prolonged use of topical steroids was found to be significant risk factor in 14 percent and 6 percent of the patients.
- On diagnostic nasal endoscopy findings, fungal debris was found to be present in 46 percent of the patients, while nasal polyp and mucosal discoloration was present in 28 percent and 26 percent of the patients respectively. *Aspergillus Niger* and *Aspergillus Fumigatus* was present in 32 percent and 24 percent of the patients. Mucormycosis was present in 12 percent of the patients while *Candida albicans* was present in 14 percent of the patients respectively. Combined *Aspergillus*, Mucormycosis and *Candida* were detected in 10 percent of the patients, while combine Mucormycosis and *Candida* were present in 8 percent of the patients.
- KOH findings were positive in 90 percent of the patients.
- Mean SNOT 22 score during preoperative, postoperative 1 week, postoperative 2 weeks, postoperative 3 weeks, postoperative 4 weeks, postoperative 6 weeks, postoperative 8 weeks, postoperative 10 weeks and postoperative 12 weeks was found to be 62.3, 31.1, 26.5, 21.2, 20.1, 18.5, 15.4, 12.3 and 10.8 respectively. While analysing statistically, a significantly reduction in mean SNOT 22 score during different follow-up intervals was seen

## Conclusion

The prompt diagnosis of fungal rhinosinusitis especially aspergillosis and Mucormycosis is highly important due to the angioinvasive nature of the organisms, which necessitates critical alert to clinicians for prompt debridement and aggressive anti-fungal therapy. Functional endoscopic sinus surgery is an effective first line of management in fungalsinusitis. Antifungal chemotherapy combined with surgery offered better treatment outcome as compared to surgery or chemotherapy as a single modality of treatment.

**Informed consent:** written informed consent was taken from patients.

**Ethical approval:** ethical committee approval was taken from the AIMSR institutional committee of ethics.

**Source of funding-** funding source was self

**Conflict of interest** – there was no conflict of interest

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