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Original Article

To determine the fungal diseases of nose and paranasal sinuses

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ABSTRACT:

Aim: To determine the fungal diseases of nose and paranasal sinuses. **Methods:** A total of 80 patients with clinical characteristics indicative of fungal infection of the nose and paranasal sinuses were examined using a standard pro forma and performed the following investigation techniques when indicated. As preliminary investigations, hemograms, blood sugar levels, serum electrolytes, serum protein, blood grouping, and other tests were performed to examine the overall health state and rule out any underlying illnesses. All patients had relevant X-rays of the nose and paranasal sinuses obtained, and those who were tentatively diagnosed with fungal granulomas had CT scanning of the nose, paranasal sinuses, and brain with contrast enhancement investigations. **Results:** In our research, all patients had nasal symptoms 80. (100 percent). Nasal blockage, nasal discharge, postnasal discharge, frequent sneezing, diminished or full loss of smell (anosmia), and nasal bleeding are the symptoms. In our research, 20% of participants had proptosis, epiphora, diplopia, or blurred vision. In our research, 80 patients had fungal culture. Thirty are Aspergillusflavus, nine are Aspergillus fumigates, eight are Aspergillusniger, and three are Aspergillusterreus. In our analysis, the maxillary sinus was involved in 81.25 percent of cases. Next, 75 percent of the ethmoid sinus, 45 percent of the frontal sinus, 53.75 percent of the sphenoid sinus, and 31.25 percent of all sinuses are involved. **Conclusion:** Our series of 80 patients was histopathologically proved to be allergic Aspergillus sinusitis in almost all of them. CT was shown to be quite useful for preoperative assessment and intraoperative guiding. Fungal sinusitis was associated with nasal polyposis.

Key words: Allergic fungal rhinosinusitis, Aspergillus, Endoscopic sinus surgery, Fungal culture, Sinonasal polyposis

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INTRODUCTION

Earth is home to an estimated 1.5 million fungal species, the great majority of which are poorly characterised or unknown. [1] Because fungi are found everywhere, human exposure is unavoidable, and regular breathing will frequently deposit fungal components inside the nose and paranasal sinuses. [2] In most cases, the presence of fungal components in the nose is insignificant and will go unnoticed until complex cultivation procedures are applied. Fungal species may induce sinonasal illness in rare cases, with clinical consequences ranging from moderate symptoms to cerebral invasion and death. Fungal rhinosinusitis has been classified mostly based on whether or not the fungus invades local tissues, a trait that is intricately related to the state of the host's immune system. [3] Fungal colonisation, fungal ball, and allergic fungal rhinosinusitis are all examples of noninvasive fungal rhinosinusitis (AFRS). Acute invasive, chronic invasive, and chronic granulomatous fungal rhinosinusitis are characterised by fungus spread into local tissues.

The lungs are the most prevalent location of fungal infection in humans, with or without hematogenous dissemination to other organs. Localized fungal infection, on the other hand, may develop in the upper respiratory tract and is more prevalent than previously thought. [4-5]Onlydermatophytes are transmissible from host to host, and most fungal species that are harmful to humans induce opportunistic infection. The prevalence of fungal infections and mortality has been drastically underestimated, and the number of fungus species capable of causing illness in immune deficient people is continually expanding. In an age of AIDS, broad-spectrum antibiotics, cytotoxic medicines, and organ donation, candidiasis and rhinosporidiosis are fungal infections that affect the nose and sinuses. Aspergillus, actinomycosis, coccidioidomycosis, histoplasmosis, cryptococcosis, blastomycosis, sporotrichosis, and nocardiosis are all examples of fungal infections. Martin and Berson observed a high occurrence in South Africa, which they linked to malnutrition in the biggest group of cases. [6-8]In our investigation, fungal infections were characterised by nasal polyps, nasal block, nasal discharge, headache, and proptosis, all of which resembled benign or malignant tumours of the nose and paranasal sinuses.

MATERIAL AND METHODS

After receiving clearance from the protocol review committee and the institutional ethics committee, the prospective and observational research was carried out at the Department of ENT. A total of 80 patients

with clinical characteristics indicative of fungal infection of the nose and paranasal sinuses were examined using a standard pro forma and performed the following investigation techniques when indicated. As preliminary investigations, hemograms, blood sugar levels, serum electrolytes, serum protein, blood grouping, and other tests were performed to examine the overall health state and rule out any underlying illnesses. All patients had relevant X-rays of the nose and paranasal sinuses obtained, and those who were tentatively diagnosed with fungal granulomas had CT scanning of the nose, paranasal sinuses, and brain with contrast enhancement investigations. The Consultant Microbiologist validated the clinical diagnosis of nasal fungal infection using microbiological testing. Following that, the Consultant ENT sent the patient to the lead investigator for testing inside the ENT department.

Patients were asked to return for frequent check-ups after surgery. After the initial post-operative endoscopic evaluation and cleaning, every patient received nasal douching on the fifth post-operative day. Beclometasone aqueous nasal spray, antihistamine, and vitamins were used to treat the patient. Patients were asked to return on the 15th post-operative day for an endoscopic inspection and cleaning, as well as whenever possible afterwards. Antifungal medication was not required for the patient with allergic Aspergillus sinusitis. The kind of fungal infection and its invasiveness were used to determine antifungal treatment (mucormycosis).

RESULTS

There were 30 men and 50 women among the 80 patients studied. They were all of Indian descent. In this research, there were more females than males. Females made up 62.5 percent of the total number of cases in this research. The majority of cases were between the ages of 35 and 45. (Table 1and table 2).

In our research, all patients had nasal symptoms 80. (100percent). Nasal blockage, nasal discharge, postnasal discharge, frequent sneezing, diminished or full loss of smell (anosmia), and nasal bleeding are the symptoms. In our research, 20% of participants had proptosis, epiphora, diplopia, or blurred vision. (table 3.)

In our research, 80 patients had fungal culture. Thirty are Aspergillusflavus, nine are Aspergillus fumigates, eight are Aspergillusniger, and three are Aspergillusterreus (Table 4).

In our analysis, the maxillary sinus was involved in 81.25 percent of cases. Next, 75 percent of the ethmoid sinus, 45 percent of the frontal sinus, 53.75 percent of the sphenoid sinus, and 31.25 percent of all sinuses are involved.

Table 1: Gender distribution of the patients

Gender	Number	%
Male	30	37.5
Female	50	62.5

Table 2: Age distribution of the patients

Age	Number	%
below 25	15	18.75
25-35	21	26.25
35-45	40	50
above 45	4	5

Table 3: Clinical symptoms

Symptoms	Number of patients	%
1. Nasal Nasal obstruction Nasal discharge Post nasal Discharge	80	80
2. Headache	56	70
3. Ocular Proptosis Epiphora Diplopia Ophthalmoplegia	16	20

Table 4: Histopathology and fungal culture

Causative organism	Number of patient	%
Aspergillusflavus	30	37.5
Aspergillusfumigatus	9	11.25
Aspergillusniger	8	10
Aspergillusterreus	3	3.75
No growth	30	37.5

Table 5: CT scan of nose and sinus

Sinus involvement	Number	%
Maxillary sinus	65	81.25
Ethmoidal sinus	60	75
Frontal sinus	36	45
Sphenoidal sinus	43	53.75
All sinuses	25	31.25
Orbital	13	16.25

Table 6: Complications

Complication	Number of patient	%
Intraoperative hermorrhage	8	10
Synechiae	24	30
Periorbital ecchymosis	9	11.25

Table 7: Follow-up and recurrence

Number of cases	Month of follow-up	Number of recurrence
20	18 months	9
40	12 months	3
20	6 months	-

DISCUSSION

Fungal illnesses of the nose and paranasal sinuses involve not just one disease entity, but a full range of disorders. We investigated many illness reasons, including allergic A. sinusitis (80 cases). Although the therapy for these disorders is significantly different, their presentation and clinical aspects are quite similar, and they might therefore be examined together. We endeavoured to analyse various disorders under one umbrella, noting crucial distinctions as needed. [9-11]

There were 30 men and 50 women among the 80 patients studied. They were all of Indian descent. In this research, there were more females than males (Table 1). Females made up 62.5 percent of the total number of cases in this research. The majority of cases were between the ages of 35 and 45. Waman et al. found a 65 percent female prevalence with allergic A. sinusitis in our investigation. This is consistent with the previously reported studies.

All of the individuals in our research had nasal problems. Nasal blockages, nasal discharge, frequent sneezing, diminished smell (hyposmia), total loss of smell (anosmia), and nose bleeding were among the nasal symptoms. The second most prevalent symptom was a headache, which was experienced by 70% of our patients. Ocular symptoms such as epiphora, diplopia, and blurring of vision were the second most prevalent, accounting for roughly 20% of all cases. According to previous research, the most prevalent symptoms of allergic A. sinusitis include persistent nasal blockage and postnasal discharge. [12,13] These results are consistent with our observations.

In our investigation, all 80 patients presented with nasal polyps and fungal masses (100 percent). Proptosis, diplopia, and ophthalmoplegia were reported in 20% of the cases.

In fungal sinusitis, 80 distinct fungal illnesses have been described. Aspergillus is the most widely encountered fungus in the environment and the most common species seen in fungal sinusitis in general, and probably in allergic fungal sinusitis. The latter is mostly based on histological findings of fungus with morphologic traits comparable to Aspergillus, rather than culture data. In our study, aspergillus was found in 100 percent of the fungal sinusitis cases. Our analysis found that A. sinusitis is completely allergic. Klossek et al. revealed that 94 percent of histopathologically verified allergic A. sinusitis patients in his case series of 100 cases. Various additional organisms have been described as pathogens in allergic A. sinusitis caused by different fungi. Australians, Bipolarisspecifera B, Aspergillus, Alternaria, and CurvularialunataThe discovery of these fungus may be attributed to microbiology labs' enhanced capacity to distinguish the various hyphae with variation in the conical pores. [14,15]

All instances of allergic A. sinusitis in our investigation were submitted for fungal culture. The material supplied for culture in all instances was a fungal mass extracted from the diseased sinus cavity. 50 of the 80 cases tested positive for aspergillus, whereas the remaining 30 tested negative. of 80 patients Thirty are Aspergillusflavus, nine are Aspergillus fumigates, eight are Aspergillusniger, and three are Aspergillusterreus. No further fungus species were detected in our research, either by HPE or culture inspection. Preoperative CT scans were performed on all patients in this series; MRI scans were not considered owing to the high cost factor and very limited quantity of supplementary information in instances of fungal infections of the nose and paranasal sinus.

By CT, all patients in our series with allergic A. sinusitis had regions of significant change centrally

inside the affected sinus. These regions matched surgical findings of thick allergic mucin. Some instances show a material pattern like a starry sky, which looked to be calcium concentrations on bone windows. CT scanning has been quite helpful in determining the entire scope of the illness. Within the sinuses, A. sinusitis often includes a combination of high and low density zones. Bone windows provide a very accurate evaluation of potential invasion.

In general, Aspergillus affects just one series, most typically the maxillary sinus. In our analysis, the maxillary sinus was involved in 81.25 percent of cases. Next, 75 percent of the ethmoid sinus, 45 percent of the frontal sinus, 53.75 percent of the sphenoid sinus, and 31.25 percent of all sinuses are involved. [16]

Endoscopic sinus surgery was used in 80 patients in our research. Endoscopic sinus surgery had a lower morbidity and mortality rate, complete clearance, and a low recurrence rate in our long-term study. Despite the fact that we had no complications from functional endoscopic sinus surgery in our instances. Recurrence was seen in just 12 instances. None of the patients had complications, and they were all released the same day. This is consistent with the prior studies.

We administered steroids to our patient both topically and systemically. We routinely employ tropical intranasal steroids and limit the use of systemic steroids. In our experience, tropical intranasal steroids alone are beneficial in avoiding illness recurrence when administered on a regular basis. However, it seems that tropical intranasal steroids work best following a course of oral corticosteroids.

Antifungal drugs were not administered in any of our allergic A. sinusitis patients. Many authors have published similar results claiming that the endoscopic method is the only option for treating allergic A. sinusitis. However, other authors believe that the external method has a place in the treatment of this disorder, particularly in situations of orbital (or) intracranial expansion.

Endoscopic sinus surgery complications have been classified as major or minor based on the degree of morbidity and therapy required to avoid persistent significant complications.

In our investigation, there was an intraoperative hermorrhage in 8 patients (10%), but no cerebrospinal leak. Pheumocephalus is a documented serious consequence, as is orbital hematoma (Markmay et al., 1994). There was no loss of vision, diplopia, epiphora, meningitis, brain abscess, or localised brain haemorrhage in our trial.

By avoiding disrupting the mucosa laying on the roof of the ethmoid sinus, intracranial complications may be avoided. It's also important to keep in mind that the vertical bony wall of the olfactory groove, where the middle turbinate joins to the roof of the ethymoid sinus, might be quite thin and should be avoided. We believe that two more suggestions may aid in the prevention of cerebrospinal fluid leaks.

Synechiae were the most often seen mild complication in our research (30% of the time). This adhesion is most often found between the middle turbinate and the septum or lateral wall of the nose. Careful handling of the tissue during surgery reduces the possibility of contact between the two adjacent raw surfaces. Careful post-operative cleaning of the sinus cavity will also aid in adhesion prevention. Of the 80 patients in our research, 24 experienced synechiae that were treated in the outpatient department and did not reoccur.

Periorbital ecchymosis is the next mild consequence, accounting for 11.25 percent of all cases. These problems were seen during endoscopic sinus surgery. This is frequently caused by a lamina papyracea breach. According to previous research, uncinectomy during endoscopic sinus surgery is the most prevalent cause of lamina papyracea breach. Because recurrent illness is prevalent, post-treatment endoscopic monitoring is critical for long-term success. Furthermore, patient symptoms alone are not a sufficient indicator of persistent/recurrent illness. Complete and drastic removal of fungal debris, as well as meticulous frequent follow-up with intranasal steroids and, if necessary, systemic steroids used sparingly, will result in the greatest long-term outcome following surgery.[17-19]

CONCLUSION

Our series of 80 patients was histopathologically proved to be allergic Aspergillus sinusitis in almost all of them. CT was shown to be quite useful for preoperative assessment and intraoperative guiding. Fungal sinusitis was associated with nasal polyposis.

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