



Study to find out the effective management of invasive fungal Rhinosinusitis, in patients attending tertiary care centre, Siddipet District, South India

Dr. K Ravikanth¹, Dr. Manoj Patruni^{2*}

¹ Assistant Professor, Department of ENT, RVM Institute medical sciences & Research Centre, Telangana, India

² Assistant Professor, Department of Community Medicine, RVM Institute medical sciences & Research Centre, Telangana, India

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Abstract

Introduction: Fungi are the organisms present everywhere in our environment. Invasive fungal rhinosinusitis is a condition in which we see mycotic infiltration of the mucosa of the nasal cavity and paranasal sinuses.

Methodology: Hospital-based prospective observational study in which the diagnosis of the case is confirmed by taking a detailed clinical history, Ear Nose and Throat examination, and Diagnostic nasal endoscopy wherever required.

Results: 23% of cases belong to the age group of 56-65 years, followed by 20% in the age group of 46-55 years and least being 2 cases (7%) in 26-35 years age group. No particular age group is significantly more. The incidence of the disease was more in the male population with a sex ratio of 1.1:0.9. Among the 30 cases, 53.3% of cases treated with lipid emulsion, and 46.6 % treated with Intravenous Amphotericin deoxycholate. 76.6% of cases underwent endoscopic sinus surgery and debridement.

Conclusion: Invasive fungal rhinosinusitis is a relatively rare disease with high morbidity and mortality. Diabetes mellitus is the most common risk factor. IFRS can be successfully treated with a combination of Endonasal surgery and antifungal agents.

Keywords: acute invasive fungal rhinosinusitis (AIFRS), nasal cavity, fungi, paranasal sinus

Introduction

Invasive fungal sinusitis has a worldwide distribution. Most cases have been reported in adults, but some cases are reported among the immunocompromised children, men and women are equally affected. 1-3 Invasive fungal rhinosinusitis is very destructive in nature. This condition in particular requires urgent diagnosis and treatment; otherwise the mortality rate could be very high upto 50-80%. 4, 5 this disease occurs mostly in immunocompromised patients and is expected to have bad prognosis because of underlying disease. Advances in medical field, such as new chemotherapeutic agents and long-term use of immunosuppressive agents following bone marrow or solid organ transplantation, have resulted in an increase in the population at risk of developing AIFR. Poorly controlled type 1 diabetes mellitus, malnutrition, and excessive storage of iron in hematological diseases can also be predisposing factors for the development of AIFR. 6 There are very few studies on invasive fungal rhinosinusitis in our country, and there is insufficient data regarding the causative agents from southern part of the country. So the aim and objective of this study is to find out the common causative agent, best treatment modality and access the outcome of this disease.

Methodology

Hospital based prospective observational study conducted during January 2019 to December 2019 (1 year) in which the diagnosis of the case is confirmed by taking detailed clinical history, Ear Nose and Throat examination and Diagnostic nasal endoscopy wherever required. Haematological, investigations, Biochemical

investigations, Microbiological, Pathological, radiological investigations. Inclusion criteria: All cases of invasive fungal rhinosinusitis attending ENT Department, RVM Institute of Medical Sciences, Siddipet district, Telangana state, south India. Exclusion criteria: Patients not willing to participate in study and Patients lost in follow-up. Ethical clearance prior to the study was obtained from RVM Institute ethics committee. Follow up was of the study participants for 2 months. Endoscopic assessment is done in all these cases in the follow up. Treatment modalities used are endoscopic sinus surgery under general anaesthesia and medical management with systemic antifungal agents and comorbidities were also given equal priority and treatment was provided.

Results

23% cases belong to age group of 56-65 years, followed by 20% in age group of 46-55 years and least being 2 cases (7%) in 26-35 years age group. No particular age group is significantly more. (Table 1) Incidence of the disease was more in the male population with sex ratio of 1.1:0.9 (Figure 1) Out of 30 cases in our study 15 cases were suffering from diabetes mellitus, hypertension in 9 cases, 6 cases were non-immunocompromised. (Figure 2) In the study we found 20 cases had necrotic tissue in the nasal cavity and 10 cases had purulent discharge and hard palate erosion, followed by proptosis and rarely 2 cases with maxilla erosion. (Table 2) On culture of the nasal tissue 17% cases were found to be aspergillus species and 40 % of cases are mucor species, where as in 43% of cases no fungal growth was observed. (Table 3) Among the 30 cases 53.3% of cases were

treated with lipid emulsion Amphotericin and 46.6 % treated with Intravenous Amphotericin deoxycholate, 76.6% of cases underwent endoscopic sinus surgery and debridement.(Figure 3)The most common complication observed among the patients suffering with invasive fungal sinusitis was orbital cellulitis seen in 12 cases followed by oroantral fistula in 10 cases and in 3 cases permanent loss of vision and 4 cases died due to unknown complications.(Table 4) Among the study cases clinical outcome was favourable and the cure rate was 87% and only 13 % were reported as deaths.(Figure 4)

Table 1: Showing age distribution among the study participants

Age of the patient(years)	Frequency	Percentage
<25	5	17
26 - 35	2	7
36 - 45	5	17
46 - 55	6	20
56 - 65	7	23
>65	5	17
Total	30	100

Table 2: Clinical findings among the study participants

Clinical finding	Frequency
Necrotic tissue in the nose	20
Purulent nasal discharge	10
Hard palate erosion	10
polyposis	5
Septal erosions	3
proptosis	8
Maxilla erosion	2

Table 3: Isolated pathogen from the cases in this study

Pathogen	Frequency	Percentage
Aspergillus species	5	17
Mucor species	12	40
No fungus isolated	13	43
Total	30	100

Table 4: Complications among the study participants

complication	Frequency
Orbital cellulitis	12
Oro-antral fistula	10
Permanent loss of vision	3
Meningitis	8
death	4

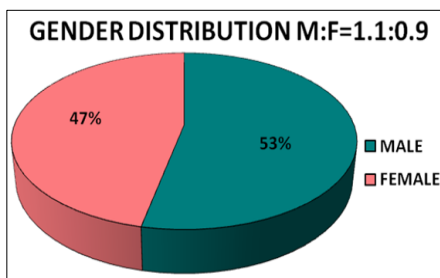


Fig 1: Showing gender distribution

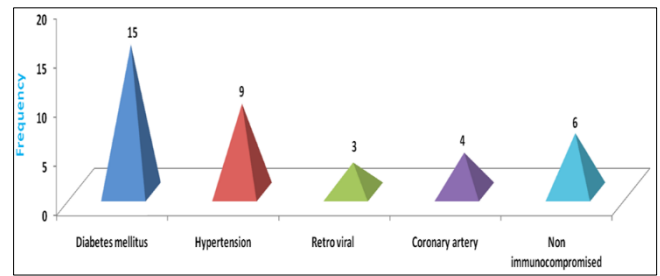


Fig 2: Showing co-morbid conditions among study participants

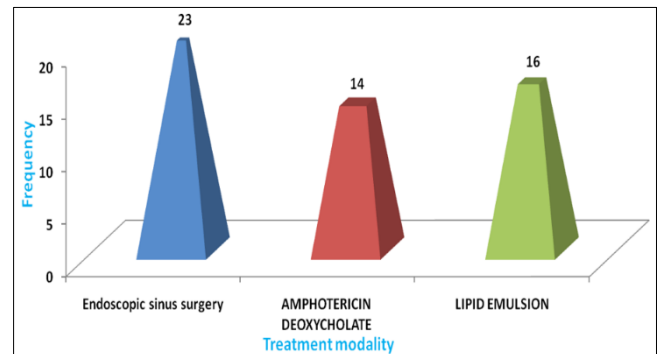


Fig 3: Various treatment modalities used on the study participants

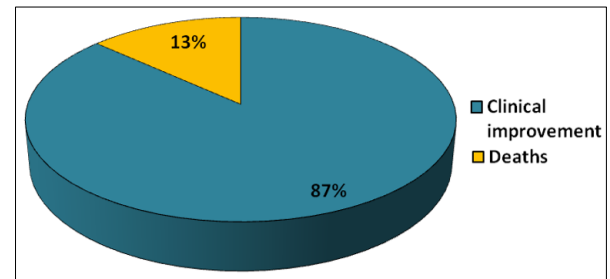


Fig 4: Prognosis in the study cases

Discussion

Ages of the patients in the study were between 15 to 70 years with a mean age group of 51.8 years. According to Patorn Pirochai *et al.* (40/7) mean age was around 51.7 years and according to navya BN *et al* 8 mean age was around 30 years. According to Sakeena J. Payne *et al.* [9] the mean age at time of evaluation was 49.4 years, with 60.3% being males and 39.7% female. The youngest patient was 15 years of age and the eldest was 70 years of age maximum number of study participants are in-between age of 46 to 65 years, probably due to increasing age leads to increase in incidence of risk factors. Prevalence was observed more in males with Male: female ratio of 1.1:0.9 which is similar to the findings of Matin ghazizade *et al.* [10] Male: female was 1.56:1 and Rupa Mehta *et al.* [11] it was 1.36:1. In this study we found that nasal discharge (36.66%), nasal obstruction (50%) and eye Swelling and pain were the commonest presenting complaint followed by few cases of fever (16.66%), nasal obstruction and nasal discharge are features of acute rhinitis hence usually neglected and leading to late presentation, these findings are comparable with the study conducted by Rupa Mehta *et al.* 11 where the common presenting complaint was nasal obstruction and nasal discharge followed by proptosis and

According to Fikret Kasapoglu *et al.* [12]. The majority of the patients presented with nasal obstruction, nasal crusting, rhinorrhoea, facial pain. In this study we found 15 cases (50%) were suffering from diabetes mellitus, hypertension in (30%) 9 cases, 3 patients were (10%) retroviral positive, 4 cases (13.33%) with coronary artery disease, no comorbidities in 20% of cases this observation is similar with the findings of Patorn Pirochchai *et al* [13] where diabetes was seen in 53.9% of cases with invasive fungal sinusitis and as reported by E.H.Middlebrooks *et al* [14] the cases are suffering with haematological malignancies (42.9%) diabetes in (28.6%) of cases. In our clinical findings 20 cases had necrotic tissue in the nasal cavity, purulent discharge in the nose in 10 cases, hard palate erosion in 10 cases, polyposis in 5 cases, septal erosions in 3 cases, maxilla erosion in 2 cases. So the common clinical finding was necrotic tissue in the nasal cavity these findings are near similar to Gillespie *et al* [15] who reported that mucosal abnormalities were most commonly seen on the middle turbinate (67%), followed by the septum (24%), hard palate (19%), and inferior turbinate (10%). According to Matin Ghazizade *et al.* [10] study showed mucor species was isolated in 80.5% of cases, which was similar with this study which revealed mucor (40%) was the commonest species that was isolated in cases of invasive fungal sinusitis followed by aspergillus species 17%. According to Patorn Pirochchai *et al.* [7] orbital cellulitis was the common complication seen in 25% of cases and cavernous sinus thrombosis in 23 % of cases and intracranial complication in 5% of cases. Whereas our study revealed 40% developed orbital cellulitis, 33.33% oro-antral fistula developed permanent loss of vision, 20% of cases developed meningitis. Similar modality of treatment was given in all studies where 100% of cases were treated with Injection Amphotericin and endoscopic debridement of necrotic and fungal debris in most of the cases that are fit for surgery. Some patients were treated with injection amphotericin deoxycholate 46.66 % and few patients 53.33% of them with lipid emulsion amphotericin B However clinically significant complications were not noted in the patients who are given amphotericin b deoxycholate. According to Rupa Mehta *et al.* [11] itraconazole has the similar efficacy in treating the cases of invasive fungal sinusitis with fewer side effects compared to amphotericin B. This study also got good clinical improvement in 26 cases (87%) and mortality in 4 cases (13%). Mortality in these cases are mostly because of the disseminated invasive fungal sinusitis and the comorbidities. Control of risk factors is most important than early medical or surgical management in cases of invasive fungal rhinosinusitis, this observation from the present study is similar with the study conducted by Rupa Mehta *et al.* [11] study mortality rate was 11% in cases of invasive fungal sinusitis.

Conclusion

Invasive fungal rhinosinusitis is a relatively rare disease with high morbidity and mortality. The most common risk factor is uncontrolled diabetes mellitus. Early diagnosis of IFR requires a high level of suspicion because of the non-specific initial symptoms and radiological signs. Diagnostic nasal endoscopy helps in early detection of bony erosions and necrotic changes. IFRS can be successfully treated with a combination of endonasal surgery and antifungal agents. Complete endoscopic

excision should be the treatment of choice for highly suspected lesions limited to the nasal cavity. Early diagnosis and management is corner stone for the improvement of disease. Multimodality treatment in controlling co morbidities plays a vital part for good prognosis of disease.

Declarations

Conflict of Interest: None declared

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