

Original Research Article

Correlation of diabetes with mycotic infections: a pilot study

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Received: 27 July 2020

Revised: 25 February 2021

Accepted: 26 February 2021

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ABSTRACT

Background: The immuno-compromised individuals have a high Incidence of fungal infections of the nose and the paranasal sinuses. There is a variation in the fungal species that manifest in different subset of individuals. The species and the susceptible individuals were studied in the Punjab population, to suggest measures to attain a better outcome.

Methods: 50 subjects treated for paranasal fungal infection by rhinology division of the oto-rhino-laryngology services, Dayanand Medical College and hospital, Ludhiana, were analysed. The prospective study was carried out in a period of one and a half year (June 2009 to December 2010).

Results: Mycotic infections was predominantly noted in the age group 51-60 years i.e. in 14 patients (28%) followed by 41-50 years, 13 cases (26%). There were 29 (58%) of males and 21 (42%) females with a male:female ratio of 1.4:1. Amongst 50 patients with mycotic infection, 19 (38%) were diabetic. All 15 (100%) patients with zygomycosis had underlying diabetes while only 4 (21%) with aspergillosis were diabetic.

Conclusions: Zygomycosis occurs usually in diabetics, while in aspergillosis the underlying morbidity may or may not be diabetes. Timely medical treatment is essential to check diabetes and species identification to select the appropriate antifungal medication.

Keywords: Aspergillosis, Diabetes, Zygomycosis

INTRODUCTION

Mycotic infections are the third most common lesions of the nose and the paranasal sinuses. Worldwide literature suggests fungal infections in the sinonasal region to be a less common entity. 117 subject study by Kulkarni et al detected only 1 case of fungal infection.¹ Zafar et al reported only 5 cases of fungal infection in their study of 240 cases over a 7 year period.² The SMS hospital Rawat et al study in Jaipur and in its vicinity detected only 16 cases of mycotic infections. They had extensively analysed 264 patients.³ The Punjab study of Dhillon et al with concentration in the Faridkot region could document only 1 case of mycotic infection out of 60 cases.⁴

Similarly, Sharma et al did not find any case of mycotic infection in their study of 50 cases at Patiala.⁵

Aim of the study

The objective was to study the incidence of fungal infections and the underlying diabetic status.

METHODS

A prospective study of 50 subjects treated for paranasal fungal infection by Rhinology division of the oto-rhino-laryngology services, Dayanand Medical College and hospital, Ludhiana, was undertaken. The study was

carried out in a period of one and a half year (June 2009 to December 2010).

Inclusion criteria

Patients only with fungal infections.

Exclusion criteria

Patients with bacterial infections

Under endoscopic visualization during surgical intervention secretions and tissues from the para-nasal sinuses were collected and subjected to Periodic acid Schiff (PAS) and Gomori’s methanamine silver (GMS) stains. The species so identified and the underlying conditions were correlated, and tabulated. The comorbidity if any was recorded.

Statistical analysis

All statistical calculations were done using the Statistical Package of Social Sciences (SPSS) 17 version statistical program for Microsoft Windows (SPSS Inc. Released 2008. SPSS statistic for windows, version 17.0, Chicago). Ethical approval of the study was taken from the Institutional Ethics Committee.

RESULTS

The observations of the study were tabulated as:

Table 1: Age distribution of study subjects with mycotic infections (n=50).

Age group	No. of cases	Percentage
0-10	0	0
11-20	5	10
21-30	7	14
31-40	4	8
41-50	13	26
51-60	14	28
61-70	6	12
>70	1	2

Most common age group presenting with mycotic infections was 51-60 years (14 cases, 28%) followed by 41-50 years (13 cases, 26%).

Table 2: Gender distribution of subjects with mycotic infections (n=50).

Gender	No. of cases	Percentage
Males	29	58
Females	21	42

Chi-square test =28.720 with 7 degrees of freedom. P value =0.0002 was statistically significant (<0.05)

which proves that mycotic infections of the sinonasal region most commonly occur in the 5th and 6th decade.

29 cases (58%) of mycotic infections were males while 21 (42%) were females with an M:F ratio of 1.4:1 (Table 2).

Table 3: Correlation of diabetes with mycotic infections (n=50).

Underlying diabetes mellitus	Fungal species detected	
	Number	Percentage
Existing	19	38
Zygomycosis	15	
Aspergillosis	4	
Not existing	31	62

Amongst 50 patients with mycotic infection, 19 (38%) were diabetic. All 15 (100%) patients with zygomycosis had underlying diabetes while only 4 (21%) with aspergillosis were diabetic.

DISCUSSION

In our study of 50 subjects of fungal sinusitis (18.7%) the most common infecting species was aspergillus, with 16 cases (32%) each of aspergilloma and aspergillosis. 15 patients (30%) with zygomycosis were seen. 2 cases (4%) of fungal granuloma were reported and in both the infecting fungus was found to be aspergillus. 1 case (2%) of candidiasis was also seen.

Zygomycosis has been traditionally associated with uncontrolled diabetes mellitus.^{6,7} In the present study; all the 15 subjects with zygomycosis species were having underlying diabetes mellitus thereby establishing a clear correlation of zygomycosis with diabetic mellitus. The finding corroborates with the Bhattacharya et al study, where one case of zygomycosis was detected and was associated with diabetes mellitus giving a correlation of 100%.⁸ Moreover the Chakrabati et al study too reported zygomycosis to be associated with diabetes in 73.6% cases.⁹

We unexpectedly detected a higher incidence of mycotic infections, probably being a tertiary health care facility with endoscopic interventional capability, more so in extensive periorbital and para cavernous regions. Another reason for more cases of mycotic infections in our study as compared to other studies is availability at our facility, of intensive care units with ventilators for palliative care. More over the fungi are delineated by periodic acid Schiff (PAS) and Gomori’s methanamine silver (GMS) stains being routinely utilised and thereby, invasive as well as non-invasive mycotic infections have been detected. In our region tropical climate, malnutrition, prevalence of quacks, more people in farming occupations; are other contributory factors to an increased prevalence.¹⁰

CONCLUSION

Zygomycosis occurs usually in diabetics while in aspergillosis the underlying morbidity may or may not be diabetes. Timely medical treatment is essential to check diabetes and species identification to select the appropriate antifungal medication.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Munjal M, Mittal N, Bansal E, Munjal S, Mehta D, Arora A, et al. Correlation of diabetes with mycotic infections: a pilot study. Int J Community Med Public Health 2021;8:1671-3.