A Mycologic Study of Otomycosis in a Tertiary Care Teaching Hospital in Karnataka, India

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ABSTRACT

Introduction: Otomycosis is an acute, subacute or chronic fungal infection of the external auditory canal. It is worldwide in distribution with a higher prevalence in the hot, humid, and dusty areas of the tropics and subtropics. A wide variety of fungi can cause Otomycosis. In this study, our aim was to determine the most common mode of presentation, predisposing factors, and the spectrum of fungi involved in Otomycosis.

Material and Methods: A total of 120 patients clinically suspected of Otomycosis were studied during the study period. All the specimens collected from patients were subjected to standard microbiological procedures for the identification of fungi involved in Otomycosis.

Results: In the present study, occurrence of Otomycosis was 78.3%. Otomycosis was found to be more common among females (56.4%) and majority in the age-group 21-30 years (34%). Pruritis was the most common presenting symptom seen in 80% of the otomycotic patients. Instillation of coconut oil was found to be the predominant predisposing factor for Otomycosis (35.1%), followed by self cleaning of external ear with hard objects (30.9%). *Aspergillus niger* 42(44.7%) was the predominant species isolated. *Aspergillus flavus* 28(29.8%) was the second most common species isolated. *Aspergillus fumigatus* 11(11.7%), *Candida* species 8(8.5%), *Mucor* 2(2.1%) and *Penicillium* species 2(2.1%) were the other species isolated.

Conclusion: Otomycosis should be suspected clinically to prevent unnecessary use of antibiotics. High incidence of Otomycosis is reported in tropical countries. In our study, *Aspergillus* species was the commonest fungi involved in Otomycosis. Laboratory diagnosis helps to know the exact etiology of Otomycosis to initiate appropriate antifungal therapy.

Keywords: Otomycosis, *Aspergillus, Candida*, Pruritus, Predisposing factors

INTRODUCTION

Otomycosis or fungal otitis externa is an acute, subacute or chronic fungal infection of the external auditory canal.[1,2] Though Otomycosis is rarely a life threatening disease, it is a challenging and frustrating entity for both patients and otolaryngologists because it usually requires long-term treatment and follow-up. Inspite of this, recurrences may occur.[3] Predisposing factors such as bacterial infection, instillation of oil, failure in the ear's defense mechanisms (changes in the coating epithelium, changes in pH, quantitative and qualitative changes in ear wax), hearing aid or a hearing prosthesis, self-inflicted trauma, swimming, broad spectrum antibiotic agents, steroids, neoplasia and immune disorders, all of which can make the host susceptible to the development of Otomycosis.[4,5] Most Otomycotic patients complain of severe itching, which often progress to pain, hearing loss, often leading to tympanic membrane perforations.[6] Most commonly isolated fungi are *Aspergillus* species and *Candida* species.[7] However, other fungi can cause otomycosis. Treatment recommendations go from germ termination or controlling predisposing factors, to local debridement (micro-aspiration) and/or the use of antimicrobial agents (topical/systemic).[8]

In the present study, we aimed to determine the most common mode of presentation, predisposing factors, and the spectrum of fungi involved in Otomycosis.

MATERIAL AND METHODS

This is a prospective, observational study in which a total of 120 clinical specimens suspected of Otomycosis received in the department of Clinical microbiology of Srinivas Institute of Medical Science and Research Centre, Mukka, Surathkal, Mangalore, between January 2015 to December 2015 were processed.

All specimens were collected using two sterile cotton tipped swabs or sterile scalpel blade. First swab/scrapped material was digested on a microscopic slide with 10% potassium hydroxide.[9] The slide was examined for fungal elements. The second swab/scrapped material was inoculated on Sabouraud's dextrose agar with chloramphenicol. Cultures were incubated in parallel at room temperature (25°C) and at 37°C for 2 to 3 weeks. On alternate days, cultures were examined for growth. Identification of fungi was done by standard procedures.[10]

STATISTICAL ANALYSIS

Microsoft Excel and Microsoft Word (version 8.1) were used to generate the tables. Results are based on descriptive statistics.

RESULTS

A total of 120 specimens were collected from patients suspected of otomycosis based on clinical features. Fungal isolates were found in 94 specimens. 41 (43.6%) of otomycotic patients were males and 53 (56.4%) were females. Highest frequency of otomycosis was found in the age group of 21-30 years, followed by 11-20 years (Table-1).

In our study, only unilateral involvement of the ear was found. Among males and females, right ear was predominantly involved. Pruritis was the predominant symptom in 80% of the otomycotic patients followed by hearing loss (42%). Other

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symptoms were ear pain (37%) and ear discharge (35%).
Predominant predisposing factor for Otomycosis was found to be instillation of coconut oil. Second most common predisposing factor was found to be self cleaning (cleaning of the ear by the patient using unsterile sticks/feather/hair pin) (Table-2).
Out of 120 specimens collected, 94(78.3%) specimens yielded growth. All specimens yielded single organism. *Aspergillus niger* 42(44.7%) was the predominant species isolated. *Aspergillus flavus* 28(29.8%) was the second most common species isolated. *Aspergillus fumigatus* 11(11.7%), *Candida* species 8(8.5%), *Mucor* 2(2.1%) and *Penicillium* species 2(2.1%) were the other species isolated (Table-3).

Age (in years)	Sex		
	Male	Female	Total
< 10	3	2	5 (5.3%)
11-20	9	13	22 (23.4%)
21-30	12	20	32 (34%)
31-40	7	8	15 (15.9%)
41-50	6	5	11 (11.7%)
51-60	3	4	7 (7.4%)
> 60	1	1	2 (2.1%)
Total	41(43.6%)	53(56.4%)	94 (100%)

Table-1: Age and sexwise distribution of Otomycosis patients

Predisposing factors	Frequencies (N = 94)
Instillation of coconut oil	33 (35.1%)
Self cleaning	29 (30.9%)
No cerumen	12 (12.8%)
Chronic suppurative otitis media	11 (11.7%)
Use of topical antibiotic eardrops	6 (6.4%)

Table-2: Predisposing factors for Otomycosis

Fungal isolates	No. of patients (N = 94)
Aspergillus niger	42 (44.7%)
Aspergillus flavus	28 (29.8%)
Aspergillus fumigatus	11 (11.7%)
Candida species	8 (8.5%)
Mucor	2 (2.1%)
Penicillium species	2 (2.1%)

Table-3: Fungal isolates from Otomycosis patients

DISCUSSION

Otomycosis is a superficial fungal infection of the external auditory canal.[11] The infection may be either subacute or acute and is characterized by pruritus, pain, mild hearing loss, superficial epithelial exfoliation, debris containing fungal hyphae and spores. Occurrence of Otomycosis was high in our study (78.3%) when compared to the studies conducted by Kaur et al[12] and Barati et al.[13] The higher incidence of Otomycosis may be due to high degree of humidity. Most of the patients were from fisherman community, as this study was conducted in a coastal region. In our study, females (56.4%) were more commonly affected by Otomycosis than males (43.6%). Similar findings were reported in a study conducted by Zaror et al.[14] However, males were predominantly affected in the study conducted by B Pradhan et al. The occurrence of bilateral otomycosis is very low.[15] In our study only unilateral involvement was found. Ho et al observed a bilateral involvement in 7% of the patients.[3]
The incidence of Otomycosis in our study was high in the age group of 21-30 years (34%) followed by 11-20 years (23.4%). This may be due the fact that immune-compromised states are less common in younger age group.[6] In the present study, the predominant predisposing factor for Otomycosis was found to be coconut oil instillation into the external ear (35.1%). Coconut oil is reported to have sporostatic action.[16] and therefore may help preserve the viability of fungal conidia deposited in the external ear and indirectly contribute to occurrence of Otomycosis. In our study second most common factor was self cleaning (30.9%) (by using unsterile sticks/feathers/hair pins/ rolled papers etc.). Habit of cleaning ear with such contaminated objects leads to inoculation of fungal debris in external auditory canal. Moreover it damages the normal lining epithelium, which is the natural defense against such infections. Other predisposing factors were lack of cerumen (whose role is protective in the external auditory canal), chronic suppurative otitis media and prior use of topical antibiotic eardrops. This is in accordance with the study conducted by Pontes et al.[17]
Most common symptoms of Otomycosis are pruritis, hearing loss, ear discharge and ear pain. This is in agreement with the other studies.[18,19] In our study, *Aspergillus niger* was the most commonly isolated organism. This is in accordance with the other studies.[20,21] *A. flavus* was found to be the second most common causative agent followed by *A. fumigatus.* However, Kaur et al[12] reported, *A. fumigatus* as the common causative agent of Otomycosis followed by *A. niger*. *Aspergillus* species and *Candida* species are the most commonly identified fungal pathogens in Otomycosis.[22] However, other etiologic agents include *Allescheria boydii, Scopulariopsis, Rhizopus*, and *Absidia*.[23]

CONCLUSION

Clinical suspicion of otomycosis can prevent unnecessary use of antibiotics. High incidence of Otomycosis is reported in tropical countries. In our study, *Aspergillus* species was the commonest fungi involved in Otomycosis. As clinical features are non specific, laboratory diagnosis helps to know the exact etiology of Otomycosis to initiate appropriate antifungal therapy. Educating the rural population is another important concern and needs to be addressed.

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