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Mycological Profile of Otomycosis in Tertiary Care Teaching Hospital

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A B S T R A C T

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. 60 Ear discharge samples were collected aseptically using two sterile cotton swabs. One swab was used for direct microscopic examination and used for fungal culture. For mycological identification, direct microscopic examination was carried out by 10 % KOH examination and inoculation of material was done on two slants of Sabouraud's Dextrose Agar (SDA) with chloramphenicol (Himedia, India). Identification was done on the basis of colony morphology, Lactophenol Cotton Blue (LPCB) mount microscopy and germ tube test. Out of 60 specimens, Fungal isolates were found in 44 (73.33%) specimens. *Aspergillus niger* 21 (47.72%) was the predominant species isolated. Followed by *Aspergillus flavus* 12 (27.27%), *Candida albicans* 05 (11.36%), *Aspergillus fumigatus* 04 (9.10%), *Mucor* 01 (2.27%) and *Penicillium* species 01 (2.27%) Highest frequency of Otomycosis was found in the age group of 15 – 35 years, followed by >35 – 55 years. Predominant predisposing factor for Otomycosis was found to be instillation of coconut oil (36.36%) followed by self-cleaning (31.82%). Hearing loss (77.27%) was the predominant symptom in Otomycotic patients followed by pain (70.45%). Rural communities with higher practice of self-cleaning and using home remedies to get relief from ear ailments are at higher risk of Otomycosis. Species like *Aspergillus* and *Candida* are the common species involved in such cases. There is a need to educate rural population about serious complications of self-cleaning and using home remedies for ear problems.

Introduction

Otomycosis is a superficial, sub-acute or chronic infection of the external auditory canal, usually unilateral, that is characterised by inflammation, pruritus and scaling (Agrawal *et al.,* 2001). Otomycosis is worldwide in distribution with prevalence ranging from 9% to 30% among patients presenting with signs and symptoms of otitis externa and discharging ears in otolaryngology settings. The frequency of otomycosis depends upon different climatic conditions with higher prevalence in the hot, humid and dusty areas of the tropics and subtropics (Pontes *et al.,* 2009; Pradhan *et al.,* 2003). Most patients suffer from Otomycosis complain of severe itching which often

progress to pain, hearing loss, and often leading to tympanic membrane perforations (Viswanatha *et al.,* 2012). The most isolated fungi are *Aspergillus* species and Candida species. (Mishra *et al.,* 2004) 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) (Hurst *et al.,* 2001).

The present study was conducted to determine the common presenting symptoms, predisposing factors and spectrum of fungi involved in Otomycosis.

Materials and Methods

This study was carried out in the Department of microbiology, JMF's ACPM Medical College, Dhule. 44 cases selected for this study were taken from OPD of ENT department of ACPMCH, Dhule. Ear discharge samples were collected aseptically using two sterile cotton swabs. One swab was used for direct microscopic examination and used for fungal culture.

For mycological identification, direct microscopic examination was carried out by 10 % KOH examination and inoculation of material was done on two slants of Sabouraud's Dextrose Agar (SDA) with chloramphenicol (Himedia, India), which was incubated at 25^{o}C and 37^{o}C aerobically for a period of 4 weeks. Culture media were examined for presence of colonies every 3-4 days. Identification was done on the basis of colony morphology and Lactophenol Cotton Blue (LPCB) mount microscopy. *Aspergillus* isolates were characterized by varying length of conidiophores and extent of coverage of vesicles by phialides and conidia. For characterization of *Candida* isolates, germ tube test was done by observing the production of germ tubes on isolates in serum after 1-2 hours of incubation at 37˚C and colonies were inoculated on HiChrome agar for identification of species. (Chander J *et al.,* 2018)

Results and Discussion

A total of 60 specimens were collected from patients suspected of Otomycosis based on clinical features. Fungal isolates were found in 44 (73.33%) specimens. All specimens yielded single organism.18 (40.90%) of Otomycotic patients were males and 26 (59.10%) were females.

Aspergillus niger 21 (47.72%) was the predominant species isolated. *Aspergillus flavus* 12 (27.27%) was the second most common species isolated. *Candida albicans* 05 (11.36%), *Aspergillus fumigatus* 04 (9.10%), *Mucor* 01 (2.27%) and *Penicillium* species 01 (2.27%) were the other species isolated (Table 1). Highest frequency of Otomycosis was found in the age group of 15 – 35 years, followed by 36 – 55 years (Table 2).

In our study, among males and females, right ear was predominantly involved and only unilateral involvement of the ear was found. Predominant predisposing factor for Otomycosis was found to be instillation of coconut oil followed by self-cleaning (cleaning of the ear by the patient using unsterile sticks/feather/hair pin) (Table 3). Hearing loss was the predominant symptom in 77.27% of the Otomycotic patients followed by pain 70.45%. Other symptoms were itching, tinnitus and ear discharge (Table 4).

Otomycosis is a superficial mycotic infection of the external ear canal. Andrall and Gaverret were the first to describe fungal infections of the ear. (Prasad SC *et al.,* 2014). 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. In the present study isolation rate of fungi from the suspected cases was 73.33% which is in accordance with other studies (Kaur *et al.*, 2000, Bharti *et al.*, 2011).

Table.1 Mycological profile of otomycosis

Sr. No.	Fungal isolates	Number of patients	Percentage (%)
1.	*Aspergillus niger*	21	47.72
2.	*Aspergillus flavus*	12	27.27
3.	*Candida albicans*	05	11.36
4	*Aspergillus fumigatus*	04	9.10
5.	*Mucor* Species	01	2.27
6.	*Penicillium* Species	01	2.27

Table.2 Distribution of patients according to age group

Sr. No.	Age group	Number of Patients	Percentage (%)
1.	5 – 15	05	11.36
2.	16 – 35	29	65.91
3.	36 – 55	08	18.18
4.	> 55	02	04.55

Table.3 Predisposing factors for otomycosis

Sr. No.	Predisposing factors	Number of Patients	Percentage (%)
1.	Instillation of coconut oil	16	36.36
2.	Self-cleaning	14	31.82
3.	No cerumen	06	13.67
4.	CSOM	05	11.36
5.	Prior therapy (Ear drops)	03	06.82

Table.4 Presenting clinical symptoms at the time of diagnosis

Sr. No.	Clinical Symptoms	Number of Patients	Percentage (%)
1.	Pain	31	70.45
2.	Discharge	14	03.10
3	Itching	26	59.10
4.	Hearing loss	34	77.27
5.	Tinnitus	02	04.55

Aspergillus spp was found to be predominant fungus isolated from 84.09% patients followed by *Candida* and other spp. This finding is in accordance with other findings reported from India (Aneja *et al.*, 2010; Nandyal *et al.*, 2015). Among *Aspergillus*

spp, *A. niger* (47.72%) was the predominant fungi followed by *A. flavus* and *A. fumigatus*, which is similar to other studies (Prasad *et al.,* 2014; Viswanatha *et al.,* 2012). Candida was reported as the predominant organisms with Otomycosis in immunocompromised hosts and in post-operative cavities.

The occurrence of bilateral otomycosis is very low (Yehia *et al.,* 1990). In our study only unilateral involvement was found. Ho *et al.,* observed a bilateral involvement in 7% of the patients (Ho *et al.,* 2006). Our study population mainly comprised of younger age group which is in accordance with studies from India and other countries. The Incidence of Otomycosis was more in >15-35 years age group with 65.91% cases followed by age group of >35- 55 years with 18.18% cases which goes well with other studies (Ho *et al.,* 2006).

Coconut oil has been reported to be sporostatic (Jain *et al.,* 1992) and therefore may help preserve the viability of fungal conidia deposited in the external ear long and indirectly contribute to occurrence of Otomycosis. In our study second most common factor was self-cleaning (31.82%) (by using unsterile sticks/hair pins etc.) Habit of cleaning ear with such contaminated objects leads to inoculation of fungal debris in external auditory canal. Moreover it damages normal lining epithelium, which is the natural defense that protect against such infections. Other predisposing factors were lack of cerumen, CSOM and prior antibiotic therapy (ear drops). This in accordance with the study conducted by (Pontes *et al.,* 2009).

Among clinical symptoms, Maximum patients presented with hearing loss (77.27%) followed by pain 70.45%. In another study, pain was reported as the major symptom followed by discharge and hearing loss (Ho *et al.,* 2006).

Rural communities with higher practice of self-cleaning and using home remedies to get relief from ear ailments are at higher risk of Otomycosis. Species like *Aspergillus* and *Candida* are the common species involved in such cases. There is a need to educate rural population about serious complications of self-cleaning and using home remedies for ear problems.

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