



## Original Research Article

### A Study of Mycotic Ear Infections in a Tertiary Care Hospital

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#### ABSTRACT

##### Keywords

Otomycosis,  
Sabourads  
dextrose agar,  
*Aspergillus*,  
*Candida*,  
Slide culture

Otomycosis is a fungal infection of external ear, middle ear and open mastoid cavity. It is most common in the regions with warm climate and varying humidity. The present study has done to know the prevalence of various fungi causing ear infections. This is a prospective study done for 2 years in the Department of Microbiology. Samples were processed by using Sabourads Dextrose Agar and exact morphology is identified by slide culture technique. From a total of 109 specimens from clinically diagnosed patients of otomycosis, fungi isolated on culture were 88 (80.73%), while positive by microscopy and isolated on culture were 84 (77.06%). Among 109 specimens, *Aspergillus* species was most commonly isolated organism about 75%. Conclusion: Knowing exact etiology of mycotic ear infections to initiate appropriate therapy, in turn lesser hospitalization to patients.

#### Introduction

Fungi gave rise to a wide range of less dramatic conditions that are virtually untreatable either because of absence of appropriate drugs or antifungal agents cannot be delivered on site in the requisite concentration. One of such cases is Otomycosis, a form of external otitis caused by fungi growing on shed skin in the ear canal. The condition is particularly common in the regions of the world with a warm climate and varying humidity.

The fungi, usually secondary invaders of the tissue, rendered susceptible by bacterial infections, physical injury or excessive

accumulation of cerumen in the external auditory canal. Sometime, it may be simply a nonpathogenic colonization (Jagadish Chander, 2013).

Otomycosis is a superficial mycotic infection of the outer ear canal and accounts for 10% of the otitis externa cases. The infection may be either subacute or acute and is characterized by inflammation, pruritus, scaling and severe discomfort. The mycosis results in inflammation, superficial epithelial exfoliation, masses of debris containing hyphae, suppuration and pain (Bassiouncy *et al.*, 1986). A consensus has

emerged that because fungal organisms are much more common in chronic external otitis than in acute disease, they are more likely to be implicated in the pathogenic process (Braude *et al.*, 1981).

*Aspergillus niger* is considered as main causative agent (AlDoory, 1980). No age group is immune but is commonly seen between 2nd and 3rd decades of life. In the majority of cases the disease is unilateral. It is likely that dormant spores of fungus lying in the ear canal starts multiplying under the favorable conditions of optimum temperature and humidity (Sood *et al.*, 1967).

Living in damp surroundings or in the presence of yeast, spores seem to favor it. So it is common among bakers. Predisposing factors for otomycosis are High temperature climates with high humidity, frequent swimming and bathing, Diabetes, trauma, irrational usage of broad spectrum antibiotics (locally).

The present study has undertaken to isolate the fungal agents causing infection in external auditory canal and the distribution of "Mycotic ear infection" in patients with HIV infection, diabetes mellitus, drug induced immunosuppression and immunocompetent patients.

## **Materials and Methods**

109 cases clinically diagnosed as Otomycosis were selected, with clinical features of Ear discharge associated with itching, pain. The samples were collected from external auditory canal from the patients attending the Out Patient Department of ENT, GGH, Kurnool and were processed in the department of Microbiology, KMC, Kurnool during the period from Dec 2009 to Feb 2011.

Informed consent has taken from patient and Ethical Committee has approved to do this study.

A detailed case history recorded regarding the Age, Sex, Occupation, Socioeconomic status and causes of the otomycosis, such as history of trauma and agents causing trauma, H/O any previous surgery and their duration, History of using antibiotic drugs if any, before coming to the hospital. The examination of external auditory canal and tympanic membrane carried out with the reflected artificial light of Bull's eye lamp over a forehead mirror. For syringing, an ordinary metal aural syringe was used. With a 512 HZ tuning fork, hearing tested in all the cases by Webers test and Rinnes test.

Collection of Specimens: The specimen debris from the external auditory canal was taken after syringing. The collected debris was used for direct microscopy and for fungal culture on Sabourads dextrose agar and Corn meal agar.

Direct microscopy has done to see any fungal elements in direct smear using KOH stain. All the samples collected were processed by inoculating into Sabourad's dextrose agar slants. When the growth comes the colony characteristics were noted and processed through slide culture technique using corn meal agar, to know the exact morphology of fungus. Further in detail structure of fungi was noted down by doing lactophenol cotton blue stain of growth on slide culture (Koneman and Roberts, 1985).

## **Results and Discussion**

Out of total number of 109 specimens, fungi isolated on culture were 88 (80.73%), while positive by microscopy and isolated on culture were 84 (77.06%). However in 21 (19.26%) specimens, fungal elements could

neither be seen on microscopy nor isolated on culture, 3 (2.75%) were negative by microscopy but positive by culture. Out of 109 specimens, 63 females (57.79%) were most commonly affected with otomycosis than males (42.20%). Incidence of otomycosis most commonly noted in age group of 11–40 years about 73.8%. Age wise distribution of Mycotic ear infections is depicted in table 2.

Various fungi are isolated from mycotic ear infection samples and their incidence is tabulated in table 3.

Out of 88 samples, isolation of *Aspergillus* species were most common about 66 (75%) followed by *Candida* species (14.7%). Among *Aspergillus* species most common was *Aspergillus niger*, followed by *Aspergillus fumigatus*. *Candida albicans* has noted in most of the cases. Predisposing factors for mycotic ear infections has depicted in table 4.

The incidence of "Mycotic Ear Infection" is found to be high in the patients attending the out patients department of ENT. Though it is

worldwide in distribution it is found more commonly in tropics. Otomycosis is common in India. From a total of 109 specimens from clinically diagnosed patients of otomycosis, fungi isolated on culture were 88 (80.73%), while positive by microscopy and isolated on culture were 84 (77.06%). However in 21 (19.26%) specimens, fungal elements could neither be seen on microscopy nor isolated on culture, 3 (2.75%) were negative by microscopy but positive by culture. Pradhan *et al.* (2003) reported 81.3% otomycosis, Nwabuisi and Ologe (2002) and Kaur *et al.* (2000) observed 54% and 76.8% of otomycosis respectively.

Among 109 specimens, *Aspergillus* species was most commonly isolated organism about 75%. Among *Aspergillus* species most common was *Aspergillus niger*, followed by *Aspergillus fumigatus*. Kaur *et al.* (2000), Nwabuisi and Ologe (2002) reported 78% and 63.2% respectively. *Aspergillus niger* was most commonly isolated in the present study. Chander *et al.* (1996) and Enweami and Igumbor (1997-98) reported 57.5% and 43.8% respectively.

**Table.1** Comparison of microscopy and culture among samples

		Microscopy		Total
		Positive	Negative	
Culture	Positive	84	3	87
	Negative	1	21	22
Total		85	24	109

**Table.2** Age wise distribution of otomycosis patients

Age in Years	No. of positive cases (n=88)	Percentage (%)
1-10	9	10.2
11-20	20	22.7
21-30	22	25.0
31-40	23	26.1
41-50	12	13.6
51-60	1	1.13
61-70	1	1.13

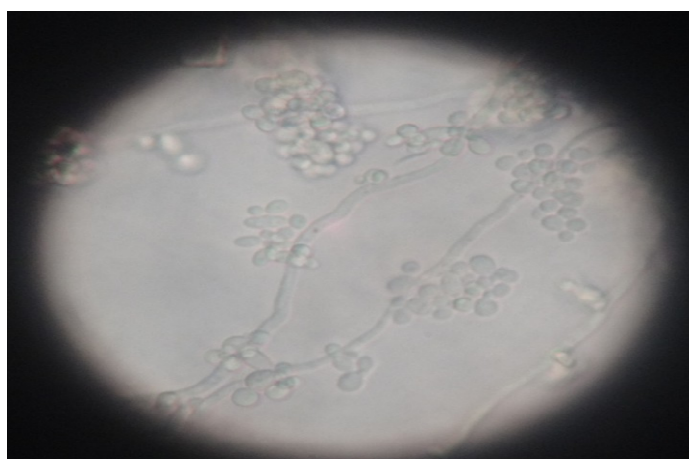
**Table.3** Incidence of fungi among otomycosis patients

S.No.	Name of the Fungus Isolated	No. of cases isolated	Percentage (%)
1	<i>Aspergillus</i> species	66	75
2	<i>Candida</i> species	13	14.7
3	<i>Rhizopus</i> species	4	4.5
4	Septate hyphae unidentified	3	3.4
5	<i>Pseudallescheria boydii</i>	1	1.1
6	<i>Absidia corymbifera</i>	1	1.1
Total		88	

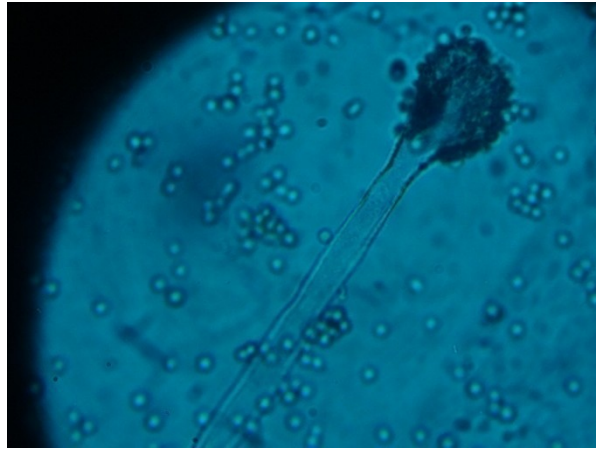
**Table.4** Incidence of predisposing factors

Predisposing Factor	No. of cases n=88	Percentage (%)
Chronic ear infection	29	32.95
Post operative cases	8	9.1
Diabetes Mellitus	5	5.6
Swimming	5	5.6
H/o Steroid therapy	-	-
HIV	-	-
Malignancy	-	-
Topical application		
Oil	30	34
Antibiotics	11	12.5

**Fig.1** Showing *Candida albicans* with yeast cells, chlamydo spores and pseudohyphae on Dalmau technique



**Fig.2** Showing *Aspergillus flavus* with vesicle, sterigmata and conidiospores with LPCB stain



The incidence of *Candida* species were 13 (14.7%). Chander *et al.* (1996) observed 3.7%, Kaur *et al.* (2000) and Nwabuisi and Ologe (2002) reported 8.2% and 35.5% respectively. Dorko *et al.* (2004) reported 52% *Candida albicans*.

Conant *et al.* (1971) isolated *Rhizopus*, but the incidence was not mentioned. In the present study the incidence of *Rhizopus* was 4.5%.

As regard to sex, Yassin *et al.* (1978) reported that sex ratio of females and males was 3:2, Mugliston and Donaghe (1985) reported that female and male ration was 2:1. Present study revealed that the ratio is of approximately 3:2.

Yassin *et al.* (1978) study constitute that adults were 82.46% and children were 8.77%. Mugliston and Donaghe (1985) noticed that the great incidence is seen in the 3rd and 5th decades. In the present study majority of the patients belong to second, third, and fourth decades (73.8%). The children below the age of 10 years constituted 10.2%. This correlated with both the studies.

In this study the most common predisposing

factors were found to be topical applications of oil (39.7%), followed by chronic ear infection (32.95%) and patients with diabetes mellitus (5.6%). Nobody came with history of immunosuppressive treatment or positive history of HIV infection.

In conclusion, otomycosis are becoming more now-a-days. When there are predisposing factors especially regular usage of topical oil application, chronic ear infection has to think about fungal ear infections. Many cases are treating with antibacterials without sending to fungal culture and bacterial culture, so that delay in the cure of disease.

#### **Acknowledgements**

We would like to acknowledge our Microbiology technical staff for their help while doing the work.

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