
Original article**The prevalence of otomycosis in Kashan, Iran, during 2001-2003****Ahmad Yegane Mogadam¹, Mohammad Ali Asadi², Rohullah Dehghani³, Hossein Hooshyar²**¹*Department of ENT, Kashan University of Medical Sciences, Kashan, Iran*²*Department of Parasitology and Mycology, Kashan University of Medical Sciences, Kashan, Iran*³*Department of Environmental Health, Kashan University of Medical Sciences, Kashan, Iran***Received:** January 2008**Accepted:** March 2009

Abstract

Otomycosis is a fungal infection of external auditory meatus and is caused by several fungi such as saprophytes, yeasts and /or dermatophytes. The aim of the present study was to find the prevalence rate of fungal otitis in Kashan, Esfahan. This study was carried out on patients, referring to medical mycology laboratory (Golabchi laboratory, Kashan, Iran) during the years 2001-2003. Patients suffering from external otitis consulted with otorhino-laryngology specialists, and referred to our laboratory. Sterile swabs were used for sampling and direct smear and cultivation techniques were used for identification. From 910 patients suffering from external otitis 52 patients (5.7%) were diagnosed to have otomycosis, 16 patients (30.8%) were males and 36 (69.2%) were females. *Aspergillus niger* was the most common cause of otomycosis (32, 61.5%) and only one case (1.2%) was diagnosed with *Scopulariopsis*. This study demonstrated that otomycosis is relatively prevalent in Kasahn where has hot and dried climate. In addition, result shows a high prevalence rate for *A. niger* in otomycosis patients.

Keywords: Otomycosis, *Aspergillus niger*, *Candida*, *Aspergillus***Introduction**

The pathogenesis of some fungi in medical science is not hidden for everyone. Approximately over 200 thousands fungal species have been recognized that only 200 species can affect man [1]. Some fungi cause human diseases nowadays are opportunistic pathogens whose numbers are increasing. They threaten the life of debilitated and depressed immune system persons due to their high adaptability nature to various environments. This is the most important cause of modality rate among these patients. In addition, the great numbers of saprophytic

and opportunistic fungi can affect various organs such as eyes, ears, nails, skin, hair, and internal organs; hence, it is important to prevent, diagnose, and treat properly these infections. This objective necessitates having access to comprehensive information from all over the world in this regard [2].

Mycotic agents account for 15-20% of fungal infections [3]. One of the fungal infections is otomycosis (the infection of external auditory meatus). It manifests with pruritus, irritation, pain, hearing loss associated with exudative inflammation. Various fungi may attribute to otomycosis

including saprophytic fungi, *Aspergillus niger*, *A. fumigatus*, *A. flavus*, *Penicillium*, *Mucor*, *Rhizopus* and *Scopulariopsis* [4,5]. In addition, several yeasts especially *Candida* species and dermatophytes (*Epidermophyton floccosum*, *Trichophyton mentagrophytes*, and *T. violaceum*) cause otomycosis [3]. With taking into account that some bacteria can cause disease with similar symptoms like fungal agent; therefore, confirming the appropriate aetiology is obviously important for proper treatment. Otherwise, improper and non-specific treatments can put high economical and financial burdens on nations and governments.

Chronic and untreated infections yielding hearing loss, and ultimately educational level and productivity rate will be fallen sharply. If epidemiological studies in societies are carried out and etiological, distributive, and ecological factors are recognized, the prevention and treatment interventions will be facilitated. As such, study had not been carried out in Kashan; the aim of the present study was to find the prevalence rate of fungal otitis in Kashan, Esfahan.

Materials and Methods

In the present study, the symptomatic patients suspected to otomycosis were sampled. Two sterile cotton wood swabs were used for sampling from ear, one for direct examination and another for culture. In addition, a questionnaire including age, gender, and the duration of the disease was also completed for each patient. Direct smears were prepared by first swab, stained using methylen blue technique and examined microscopically. The second swab was enrolled on Sabouraud's dextrose agar (Merck, Germany) with chloramphenicol (SC) and Sabouraud's dextrose agar with chloramphenicol and cycloheximide (SCC) and incubated at room temperature for one to two weeks. Isolates were identified based

on morphology and microscopy. The results were interpreted using descriptive analysis.

Results

Out of 910 examined patients (634 females and 276 males), 52 cases (16 males and 36 females) were positive for fungal otitis including; 32 cases belonged to urban area and 20 cases belonged to rural area. The distribution of their ages was as follows; 12 patients (23.1%) in the age group of 15-29, 21 patients (40.4%) in the age group of 30-44, and 19 patients (36.5%) in age group 45-60. In the present study 28 (53.8%) of patients were household, seven (13.5%) farmers, six (11.5%) sellers and 11 (21.2%) unknown.

The most common fungus causing otomycosis was *A. niger* (32, 61.5%) followed by *C. albicans* (7, 13.5%), *A. fumigatus* (3, 5.8%), *A. flavus* (3, 5.8%), *Aspergillus* species. (3, 5.8%), *Mucor* (2, 3.8%), *Rhizopus* species (1, 1.9%), and *Scapulariopsis* species (1, 1.9%). The site of the lesion in 21 (40.4%) was right ear, in 18 (34.6%) left ear, and in 13 (25.0%) both ears. Table 1 shows frequencies of patients according to the sex and species of fungi.

Out of 32 cases having *A. niger*, 14 (43.7%) were in the age group 45-60 year, 11 (34.4%) in 30-44 year and seven (21.9%) in 15-29 year. Out of 36 females affected with otomycosis, the greatest prevalence rate belonged to those infected with *A. niger* (23, 63.88%). Out of 16 male affected with otomycosis, the greatest prevalence rate belonged to *A. niger* with nine (56.25%) cases. Twenty-three (71.87%) and nine (28.12%) cases infected with *A. niger* lived in urban and rural areas: respectively. Six (85.61%) and one (14.28%) cases infected with *C. albicans* settled in the country-side and city; respectively. The main complaint in patients with otomycosis was pruritus in 96%, followed by irritation and hearing loss in 58% and 50% of patients respectively.

Table 1: The prevalence of otomycosis among examined patients in terms of fungal species and patients' gender

Causative agents	Female (%)	Male (%)	Total (%)
<i>A. niger</i>	23 (63.9)	9 (56.3)	32 (61.5)
<i>A. fumigatus</i>	2 (5.5)	1 (6.2)	3 (5.8)
<i>A. flavus</i>	3 (8.3)	0 (%)	3 (5.8)
<i>Rhizopus</i>	1 (2.8)	0 (%)	1 (1.9)
<i>Mucor</i>	1 (2.8)	1 (6.2)	2 (3.8)
<i>Scopulariopsis</i>	1 (2.8)	0 (%)	1 (1.9)
<i>C. albicans</i>	4 (11.1)	3 (18.8)	7 (13.5)
<i>Aspergillus</i> Spp.	1 (2.8)	2 (12.5)	3 (5.8)
Total	36 (100)	16 (100)	52 (100)

Discussion

The current study demonstrated that otomycosis occurred in 86% of the suspected patients. This finding is compatible with some worldwide studies. It is in accordance to the study conducted by Kaur *et al.* [4] in tropical regions on 95 symptomatic patients having otomycosis, the disease was confirmed in 71 (74.7%) by direct examinations and culture tests. Also in another study which fulfilled by Chander *et al.* [6] on 110 patients affected with symptomatic otomycosis was confirmed in 80 cases (73%) by direct and culturing examinations.

In the present study, out of 910 patients having external otitis, 52(5.7%) had otomycosis. This prevalence rate is compatible with study of Lohove Petmy *et al.* [7]. They carried out their study on 2592 patients whom were affected with external otitis. The prevalence rate of otomycosis was 6.1% in their study. However, the results of the present study are in contrast to Yehia *et al.* [8] result. Their study was carried out in northern of Iraq among 219 external otitis cases and 179 (81.7%) had otomycosis. Several reports show that otomycosis is prevalent in Iran (9-12).

The commonest etiological agent, which was mark-able for otomycosis in the present study, was *A. niger* (61.53%). This finding is compatible with worldwide-fulfilled studies. In a study carried out by Chander *et al.* [6] *A. niger* was the commonest cause of

otomycosis in 57.5% cases. In addition, our study is similar to the study of Martin *et al.* [13] in Spain with the prevalence rate of 73.3%. However, the obtained results by Kaur *et al.* [4] in the tropical regions, the commonest etiologic agents accountable for otomycosis were *A. fumigatus* (41.1%) and *A. niger* (36.9%), which this finding was in contrast to the current study. Other fungi that have been associated with otomycosis in our study are *C. albicans*, *Scopulariopsis*, *Rhizopus* and *mucor*. Other reports also show *Scopulariopsis*, *Rhizopus* and *Candida* as otomycosis agents [14-16].

Patients with otomycosis often complain of dullness of hearing, pruritus, inflammation, irritation and dried exfoliation of auditory meatus epidermis which is obvious. In our study the common symptom was pruritus followed by irritation and hearing loss. It is concluded that prevalence of otomycosis in Kashan is high. Accurate information and exact programming are needed to decrease number of otomycosis and control their complications. In this regard, information provided by this study can help authorities as well as other researchers of this field.

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