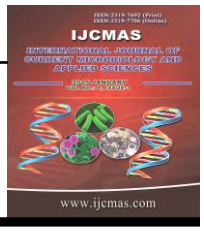
Int.J.Curr.Microbiol.App.Sci (2015) 4(3): 684-690

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 4 Number 3 (2015) pp. 684-690**
http://www.ijcmas.com



Original Research Article

Prevalence of Fungal infection in chronic otitis media-A study at a tertiary care hospital in Eastern India

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Keywords

Chronic otitis media, Antibiotics-steroid ear drops, Fungal infection

A B S T R A C T

Chronic otitis media is known to be one of most common ear infections and a leading reason for antibiotic prescriptions in the developing world. The present study was conducted on 200 patients came for consultation in the Out Patients Department of ENT, R.G.Kar Medical College, Kolkata. Apart from the use of topical drops, the humid conditions produced by the discharge, epithelial debris and alkaline pH are the other factors responsible for the secondary fungal infections. In the present study, the most common age group affected was between 21-30 years(32%). Women (57%) were more often affected than male. Most common presenting symptoms being otorrhoea followed by otalgia, aural fullness and hearing loss. Fungal infection in chronic otitis media was found significantly associated with antibiotic-steroid drop use. Out of 200 cases, 74(37%) were positive on culture. Culture positivity was more in Chronic Otitis Media (COM) without any active discharge (45.2%) than in Chronic Suppurative Otitis Media (CSOM, 29.5%). Predominant fungal isolates were *Aspergillus species* followed by other saprophytic fungi namely *Exophialla species.* Hence, in cases of persistent otorrhoea, aural fullness, otalgia or any symptoms which signifies chronic middle ear infection; aural toilet, culture and sensitivity of discharge and removal of the focus of infection should be sought before using topical antibiotic-steroid drops.

Introduction

Chronic Otitis Media (COM) is the term used to describe a variety of signs, symptoms, and physical findings that result from the long-term damage to the middle ear by infection and inflammation. Chronic Suppurative Otitis Media (CSOM) is an inflammatory condition of the ear that causes recurrent ear discharge through a perforation of the ear drum [1].

Although rarely life threatening, the disease is a challenging and frustrating entity for

both the patients and otolaryngologists as it frequently requires long-term treatment and follow up. Despite this, there could be recurrences. Chronic otitis media and CSOM are few of the common conditions encountered in a general otolaryngology clinic setting and its prevalence has been quoted to range from 9% to27.2% [2, 3] among patients who present with signs and symptoms of otitis externa and up to 30% [4,5] in patients with discharging ears. It is worldwide in distribution with a higher prevalence in the hot, humid, and dusty areas of the tropics and subtropics [2, 3, 4,5].Overview of the literature reveals otitis media to be a common medical problem in India [6, 7]. Fungi can either be the primary pathogen or be superimposed on bacterial infections or can be secondary pathogen in previously perforated tympanic membrane. It is mainly characterized by pruritus, otalgia, aural fullness, hearing impairment and tinnitus. Various predisposing factors have been proposed for fungal ear infection, including immunocompromised host, steroid usage, trauma, swimming, ear picking, use of headwear, use of oils, instrumentation of ear, fungal infection elsewhere in the body like dermatomycosis and malnutrition in children[1-7]. Wide spectrum of fungal agents such as *Aspergillus, Penicillium, Mucor, Rhizopus, Scopulariopsis, Absidia* and *Candida* are involved, species of *Aspergillus* and *Candida* being the most common etiological agents.

Despite the fact that our climatic condition may encourage fungal infection of middle ear, literature search reveals that not much work has been carried out on various aspects of fungal infection of middle ear. Keeping in view the high prevalence of fungal infection of middle ear in hot, humid and dusty areas, the study was carried out on clinical features, predisposing factors and fungal agents involved in West Bengal.

Objective

Isolate, characterize, and identify mycological agents in ear infection of COM patients. Find out distribution of fungal aetiology in COM with and without an intact tympanic membrane in R.G.Kar medical college and hospital, Kolkata.

Materials and Method

Total 200 samples were collected from ENT outpatients during Feb 2011- Jul 2011. Ear discharge swab from105 COM patients with perforated tympanic membrane (CSOM) and 95 ear swabs from the patients COM patients without perforated tympanic membrane. Ear swabs and ear discharge swabs were collected aseptically in ENT OPD. Inoculation on Sabouraud's Dextrose Chloramphenicol Agar and routine Gram stain, 20% KOH mount from samples were done. Additional slide cultures, Germ tube tests and biochemical tests done for species identification.

Results and Discussion

Fungal infection in chronic otitis media is significantly associated with antibiotics-steroid ear drop use.

The present study was undertaken to determine the occurrence of fungal infection in chronic otitis media, to know the pattern of fungal flora in CSOM and other COMs, to evaluate whether the fungus is primary or secondary invader and to make an endeavour to know whether antibiotics drops with or without steroids are mainly responsible for development of fungus in chronic suppurative otitis media and their related occurrences.

Usually, fungal infection of middle ear can be diagnosed by means of a clinical exam; nonetheless, a high rate of assumption is required, and the most frequent symptom is in this study, otorrhea and aural fullness followed by otalgia, hypocusis and pruritus. However, in this study, the diagnosis was based on symptoms and laboratory workup; and pruritus, otalgia, otorrhea and/or hypacusis were the symptoms more frequently reported by the patients. These symptoms can be attributed to factors such as humidity and heat recorded in Kolkata, as well as cerumen in the external auditory canal and/or its manipulation reported by the patients, without losing sight of the fact that most of the patients were of low socio economical status. The incidence of fungal infection of middle ear cavity is reported to be high in tropical countries [2, 3, 5, 6].

The highest incidence in the present study was seen in the third decade i.e. 32%. The same observation was made by Baruah although the incidence was much higher i.e. 71% [8]. This is in agreement with Laxmipati and Baskaran [9]. Duration of complaints ranges from 1day to 20years.mean duration of complains was 1yr 8months.

Distribution of Side of Involvement: 90% patients in this study had unilateral involvement and 10% had bilateral. Ratio of unilateral and bilateral ear involvement being 9:1. Baruah noted this ratio to be 5:1[8]. Involvement of right and left side in this study was almost equal ratio. Among the 74 fungal positive patients, unilateral involvement was in 67 (90.5%) cases. Right being 56% and left being 44%. Only 7 cases with bilateral involvement were found fungal positives (9.5%). The women (57%) in the present study were more often affected, and such figures were closer to that observed by Zaror et al. (1991)[10] (65%). However, these data are in disagreement from the findings by Kaur et al., (2000)[11], Ho et al. (2006)[12]and Yehia et al. (1990)[13]who found 60%, 56% and 52.5%, respectively in male.

The question whether fungi are the causative factor or secondary invader in chronic suppurative otitis media, it is highly unlikely that fungus is the primary invader. Acute cases of suppurative otitis media due to fungal infection have not been reported in the literature where there was no disseminated fungal infection. In none of our cases disseminated fungal infection was present.

Antibiotic-Steroid ear drop use: In the middle ear, fungal infection supervenes because of prolonged use of topical steroids. According to Mawson[14] this happens because of settling of fungal elements e.g. spores from external environment on the moist and alkaline medium of middle ear discharge and debris. Other risk factors associated were pond bathing, hearing devices used, ear picking. In this study predominant fungal isolates were *Aspergillus spp.*followed by other saprophytic fungi namely *Exophialla spp.* figures closer to Baruah et al[8], but were in disagreement to Sengupta et al and Pasternale et al[15,16] who found *Candida spp.* as common isolate.A definite search for fungal etiology is desirable in all cases of CSOM and other COMs. Prolonged use of topical antibiotics or antibiotics-steroids ear drops may cause suppression of bacterial flora and the subsequent emergence of fungal flora. This probably increases the incidence of fungal superinfection. Otolaryngologists should suspect mycotic otitis media in patients with continuous otorrhoea and who do not respond to the antibacterial treatment. In cases of persistant otorrhoea, aural toilet, culture of discharge and removal of the focus of infection should be sought before using topical drops.

Table.1 Distribution of fungal culture results from ear swabs and ear discharge

	CULTURE POSITIVE	CULTURE NEGATIVE	TOTAL
COM	43	52	95
CSOM	31	74	105
TOTAL	74	126	200

P value -- 0.0277 found to be statistically significant (alpha<0.05).

Table.2 Distribution of antibiotic-steroid ear drop use and fungal culture outcome (n=200)

Positive	Negative	Total	Negative	Total	P value	< 0.0001
Antibiotics-Steroid		38	16	54		
No ear drops		36	110	146		
Total		74	126	200		

Table.3 Distribution of symptoms and fungal culture outcome

Symptoms	Culture positive	Culture negative
Otorrhoea	43	52
Otalgia	32	58
Hearing loss	8	22
Aural fullness	21	84
Pruritus	1	2
Tinnitus –	nil	

Fig.1 Clustered column diagram showing culture positivity in different age groups

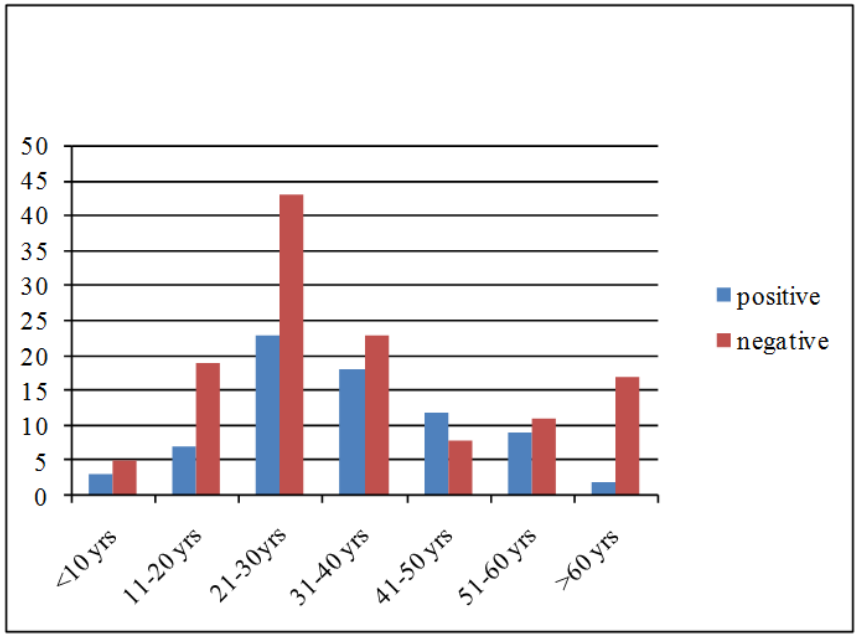


Fig.2 Distribution of positive fungal culture isolates

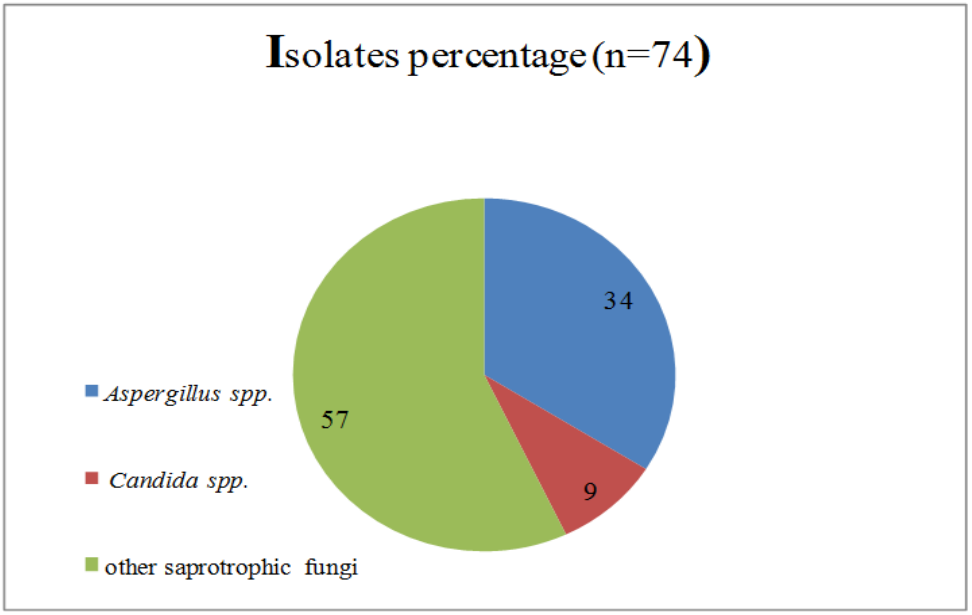


Fig.3 Distribution of *Aspergillus spp.* isolates

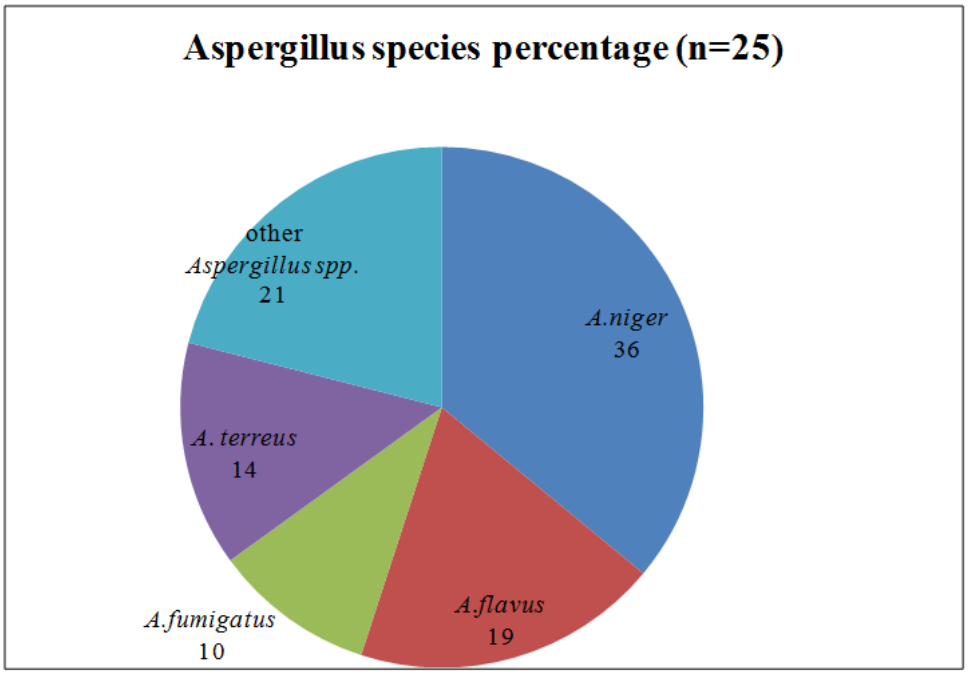
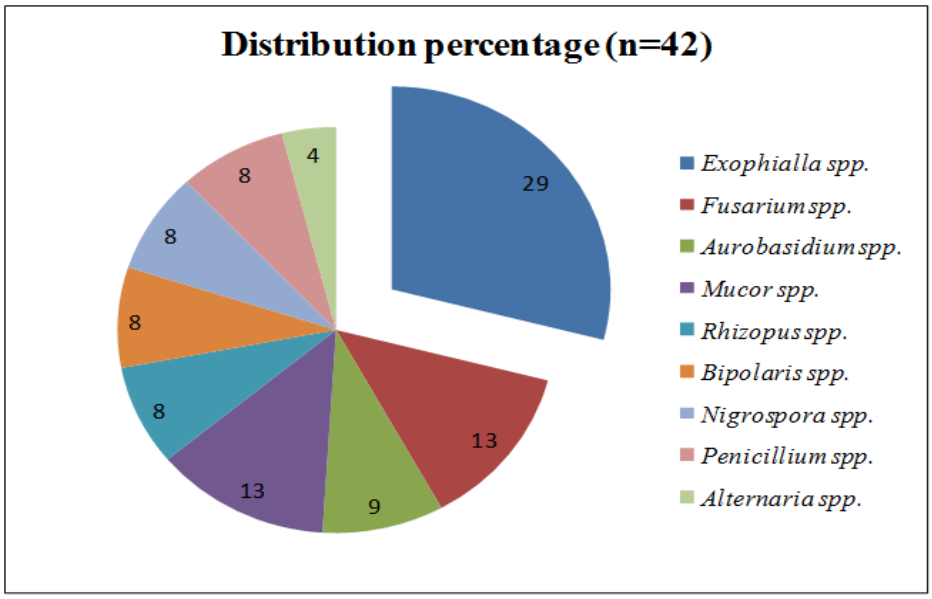


Fig.4 Distribution of other saprophytic fungal isolates



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