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FUNGAL PROFILING IN PATIENTS WITH CHRONIC SUPPURATIVE OTITIS MEDIA (CSOM) : A MICROBIOLOGICAL STUDY.

Microbiology

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ABSTRACT

INTRODUCTION: Among the bacteria causing CSOM, Fungal infection of middle ear and meatus are common as fungi thrive well in moist pus. Development of otalgia, itching and presence of hyphae indicate Fungal involvement.

AIMS AND OBJECTIVES: To identify Fungal isolates in CSOM.

MATERIAL AND METHODS: one hundred and fifty patients with tubotympanic type of CSOM were prospectively studied. They have chronic ear discharge and had not received antibiotics for the previous five days. Isolation of fungus was done by their gram staining, direct microscopy with KOH, culture tests on SDA were carried out to identify the organisms. Two sterile cotton swabs were used to collect ear discharge from CSOM patients.

RESULT: Fungal elements were observed in 3 (1.9%) of the specimens subjected to KOH mount. Culture revealed isolation of *Candida albicans* in two and *Aspergillus flavus* in one of the cases.

CONCLUSION: Bacterial flora of the ear may get suppress by the prolonged use of antibiotics or steroidal drops which subsequently might lead to Fungal growth.

KEYWORDS

CSOM, Fungal isolates.

INTRODUCTION:

Chronic suppurative otitis media (CSOM) is a disease of multiple aetiology and is well known for its persistence and recurrence, despite treatment. CSOM is a destructive disease with irreversible sequelae and can proceed to serious intra and or extracranial complications[1]. Overview of the literature reveals otitis media to be a common medical problem in India [2,3]. The etiology of chronic suppurative otitis media (CSOM) has been the subject of several studies. Fungal infection superimposed over CSOM is suspected when the discharging ear does not respond to local antibiotic ear drops.[4]Chronicity of ear discharge is important factor in the cause of fungal infection of otitis media. It causes humid condition in the ear and alters the pH to alkaline. Epithelial debris which eventually helps the growth of fungus. Topical use of steroid and antibiotics cause the fungal infection in the middle ear. [5,6] 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.

MATERIALS AND METHODS:

One hundred and fifty patients, who presented to the ENT Department from March 2013 to August 2014 with a history of chronic discharging ear were prospectively studied. Two sterile cotton swabs were used to collect ear discharge from CSOM patients. Only those cases were selected who had not taken any treatment either systemic or local in the form of ear drops for the last seven days. One swab was used for performing Gram stain and KOH preparation and second one for culture. Culture was done on nutrient agar, blood agar, Mac-Conkey agar and SDA. The organisms were identified by culture characters, morphology, and pigment production, beta-haemolysis on blood agar, motility and conventional biochemical tests. Fungal culture was done on Sabourauds dextrose agar (SDA) in required cases. Growth on the medium was identified by rapidity of growth, color and morphology of the colony on the obverse and pigmentation on the reverse. Microscopy is performed from fungal colony to study the morphology of hyphae, spore and other structures by LPCB preparation. Slide culture is done for studying the exact morphology of the fungus. Results were inter-preted using Clinical Laboratory Standards Institute (CLSI) guidelines.

RESULTS:

Out of 152 swabs, 30 (19.7%) were sterile while 122 (80.2%) yielded growth of organisms. Isolation of bacteria was done in 119 (78.2%) ears while 3 ears revealed fungal growth as *Candida albicans* in two and *Aspergillus flavus* in one of the cases.[**Table 2, fig 3**]

Age range was from 6 to 70 years, with a mean age of 27.17 years with S.D. ± 16.8. Maximum numbers of cases were found to be in the second or third decade with 35 (23.3%) cases each in 11-20 and 21-30 years age group [**fig.1**]. There was a male preponderance with a male to female ratio of 1.3:1.0. **[fig.2**]

Out of 152 discharging ears, maximum cases had purulent discharge, seen in 67(44.07%) ears. Foul smelling otorrhoea was seen in 45(29.6%) ears while none of the ears had blood stained discharge. Association with upper respiratory tract infections was seen in 92(60.5%) cases. **[Table-1]** in the present study, primary complaints of the patients were ear discharge and hearing loss. Otorrhoea was seen in 152 (100%) ears and hearing loss, observed in 83 (54.6%) ears. Tinnitus was the next frequent complaints reported in 28 (18.4%) ears. Otalgia and itching were present in only 3 (1.9%) ears. Only 3 (1.9%) cases had associated headache. Vertigo was seen only in 2 (1.3%) patient. **[Fig. 4]**

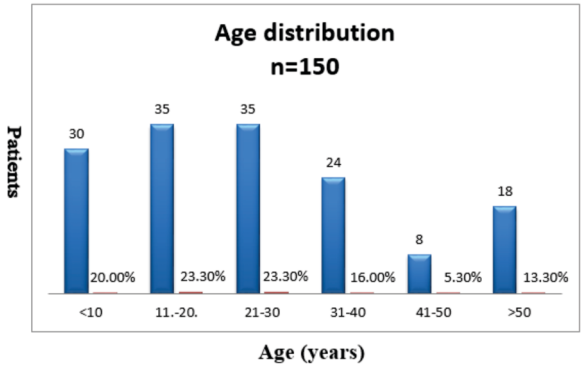
Statistical Analysis

The data collection was entered in the Microsoft Excel computer program using SPSS version 16.0 Percentage were calculated for categorical variables. and checked for any indiscrepancy. The result was presented in proportion/percentages.

Ethical Consideration

Ethical clearance was taken from Institutional Ethical Committee of Indira Gandhi Institute of Medical Sciences, Patna. The consent was taken from each patients included in the study.

Fig :1: Age distribution



The lowest age of this study was 6 years

Fig 2.- Sex distribution

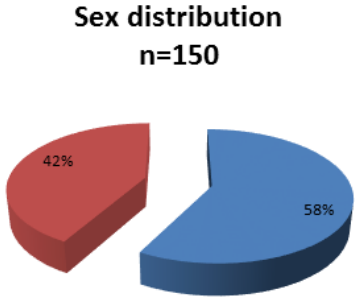


Table 1.: Character of discharge (n = 152)

Discharge		Number of ears	Percentage
Nature	Mucoid	28	18.4%
	Mucopurulent	57	37.5%
	Purulent	67	44.07%
Peridiocity	Intermittent	152	100%
	Continous	00	0%
Amount	Copious	150	98.6%
	Scanty	2	1.3%
Blood staining	Blood stained	00	0%
Odour	Foul smelling	45	29.6%
	Non foul smelling	107	70.3%
Association with URTI	Seen	92	60.5%
	Not seen	60	39.4%

Table 2: KOH mount

KOH mount	Number of ears	Percentage
Fungal element seen	3	01.9%
Not seen	149	98.02%
Total	**152**	**100%**

Fig 3.: Culture of swabs

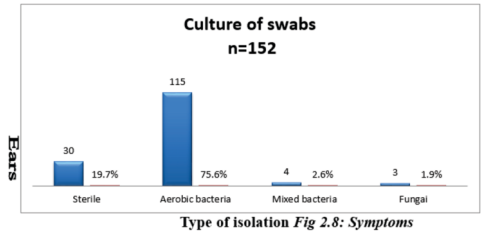
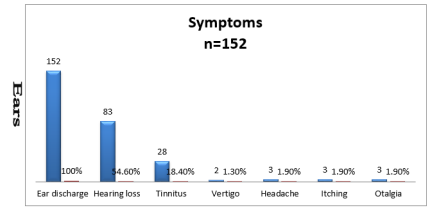


Fig 2.8: Symptoms

Fig 4: Symptom:



DISCUSSION:

The present study was undertaken to know the incidence of fungal infection in chronic suppurative otitis media. In the present study, age of the patient assorted from 6 to 70 years. The mean age was 27.17 years with standard deviation of 16.88. The commonest age group presentation was 11-20 and 21-30 years, consisting 35 (23.3%) cases in each category. These findings were in Consistent with the findings of shreshtha & Sinha[9] and Singh & safaya[10]. However, much earlier presentation was reported by Rupa V et. al.[8] and vikram BK et. al.[12]. The present study showed that CSOM was distinguished in males (58%) as compare to females (42%). The ratio of male to female Patients were 1.3:1. Analogous conclusion has been made by Chandra & Mishra[11], Mukherjee P et. al.[12] and Hossain MM et. Al[12]. They concluded that the predominant burden of the disease in males was due to their outdoor working habits exposing them for contamination and contagion. In the present study, swabs taken from 152 ears were inoculated for aerobic and fungal culture (where required). No growth was seen in 30 (19.7%) and 122(80.26%) swabs were positive for growth of microorganisms. Out of the 122 positive cultures, bacteria were isolated in 119(97.5%) swabs while, 3(1.9%) of fungal growth revealed *Candida albicans* in two and *Aspergillus flavus* in one of the cases. Similar studies by Gulati & Kumar[13] show 22% cases with no growth and Nikakhlagh S et. al.[14] reported no microbial growth in 18% cases. Low positivity rate in our study could be because of the fact that our hospital is a tertiary care centre. Patients usually present to us after having medical advice from local doctors and having taken multiple or incomplete course of antibiotics. May be they have not revealed to us the prior administration / instillation of antibiotics that could have hampered microbial growth in certain cases.

Out of 152 discharging ears, 44.07% had purulent discharge, whereas mucopurulent and mucoid discharge was seen in 37.5% and 18.4% ears respectively. Foul smelling otorrhoea was seen in 29.6% ears, while none of the ears had blood stained discharge. Association with upper respiratory tract infections was seen in 60.5% ears.

Study by Nikakhlagh S et. al.[15] and Gulati & Kumar [14] showed that purulent otorrhoea was the most common symptom at presentation and thus supports the above findings. Likewise, Khanna V et. al.[13] implicated that otorrhoea was the chief complaint in all cases, whereas hearing loss was the second commonest complaint in their study group. However, mucopurulent discharge (58.2%) observed was not in support with the findings of present study.

General cellular immunity is reduced in situations such as diabetes, steroid administration, HIV infection, chemotherapy and malignancy (especially those involving cells of immune system). This makes an immunocompromised host susceptible to fungal infections. Normal bacterial flora is one of the host defense mechanism against fungal infections[16]. This mechanism is altered in patients using antibiotics ear drops and cause otomycosis. An immunocompromised host is more susceptible to otomycosis. Patients suffering from diabetes, lymphoma, transplantation patients, patient receiving chemotherapy or radiation therapy and AIDS patients, are also at increased risk for potential complications from otomycosis[17]. The complications include hearing loss and invasive temporal bone infection.

CONCLUSION:

As the incidence of fungal positives was more in cases using antibiotic or antibiotic-steroids drops or even in chronic cases, it is suggested that treatment should not be in the form of topical drops, at the onset, patient must be given a chance with dry moppings, and systemic antibiotics. Routine use of topical antibiotic or antibiotic-steroids drops, at the onset is not justified. In cases of persistent otorrhoea, aural toilet, culture and sensitivity of discharge and removal of the focus of infection should be sought before using topical drops. In the event of mixed infections, topical antibiotics along with antifungal agents should be used.

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