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Original Research Article

A study of fungi isolated from cases of otitis media diagnosed at tertiary care hospital of Gujarat, India

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ABSTRACT

Background: Otitis media is commonest disease seen in children. Apart from bacteria fungus are responsible for majority of the cases of otitis media. The objective was to speculate the aetiological fungal flora which was responsible for the cases of otitis media.
Methods: The present study was conducted by Department of Microbiology, B. J. Medical College, Ahmedabad during 1st May 2000 to 30th April 2002. Before conducting the study approval was obtained from institutional ethical committee for human research. Total 140 patients of otitis media were included after written informed consent. The ear discharge from each diseased middle) ear was collected and cultured on Sabouraud's dextrose agar slant and was examined for gross and the microscopic morphology of the fungi. The organisms were identified by using a standard procedure. Data was analyzed using Microsoft exel software (Trial Version).
Results: Out of 140 samples 114 (81.43%) had positive culture. out of 114 cases, 64 (56.14%) were male. Majority of the cases (32.45%) were in the age group of 0-14 years. Out of 114 positive cases, single organism was isolated in 99 (86.8%) cases. Out of total 129 strains 44 (37.9%) were gram positive, 72 (62.1%) were gram negative organisms and 13 (10.07%). Out of total 13 strains of fungus isolated 6 (46.15%) were *Candida albicans* and 7 (53.84%) were *Aspergillus niger*. *Aspergillus niger* is predominant isolated fungus as compared to Candida albicans. Isolation of *Aspergillus niger* was only seen in adults.
Conclusions: *Aspergillus niger* and *Candida albicans* were found to be the common fungal causes of otitis media in our study.

Keywords: Aspergillus niger, Candida albicans, Fungal flora, Middle ear, Otitis media

INTRODUCTION

Inflammation of the ear is one of the most common illnesses in children.[1] Otitis media is an inflammatory disease of the mucosal lining of the middle ear, which includes a variety of medical conditions with different signs and symptoms.[2,3] Otitis media is most commonly caused by the buildup of fluid behind the ear drum, as a result of a blockage to the Eustachian tube. Otitis media is commonest disease seen in children along with tonsillitis, as their Eustachian tube is shorter and more horizontal than adults and is made up of more flaccid cartilage, which can impair its opening.[4]

Sources of infection in otitis media are solemnly dependent on the route by which infection reaches the middle ear and the chief route by which this occurs is the Eustachian tube.[5] So it is necessary to identify causative organism and its susceptibility to antibiotic and to inform clinician regarding this. Here, a very important role of microbiologist is to guide the clinician for causative organism and appropriate treatment. Then only we can

reduce the rate of episode of disease and its complications.[6]

Many factors like Eustachian tube dysfunction and susceptibility to upper respiratory tract infection may contribute to pathogenesis of otitis media and it is many a time accompanies respiratory tract infection.[7] Bacteria are responsible for majority of the cases. Viruses have also been implicated in some studies. Upto 50% of isolates being viruses.[8] Fungus are also responsible for this infection.

Ideal sample i.e. aspiration of middle ear fluid is difficult to obtained. It has been observed that ear swab taken from middle ear is usually contaminated with the microorganism of external ear.

So it can only be detected by carefully obtaining material from middle ear. With this background in mind this study was aimed to speculate the aetiological fungal flora which was responsible for the cases of otitis media who attended the ENT Department of B. J. Medical College, Ahmedabad, India.

METHODS

The present study was conducted by Department of Microbiology, B. J. Medical College, Ahmedabad, India during 1st May 2000 to 30th April 2002. Before conducting the study approval was obtained from institutional ethical committee for human research. Total 140 patients were included after written informed consent. These clinically diagnosed cases of otitis media formed the subject matter of our study. The ear discharge from each diseased middle) ear was collected separately in a sterilized vial (by using a long lumbar puncture needle after creating negative pressure) and in some patients, it was collected with the help of sterile culture swabs. 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. The samples were immediately sent to the microbiology laboratory for bacterial studies.

In the laboratory, the ear discharges were collected and examined microscopically (in 10% potassium hydroxide) for the presence of epithelial cells, pus cells, budding yeast cells, fungal hyphae and spores, etc. For bacterial isolation, the samples were inoculated on blood agar, MacConkey's agar and chocolate agar media and were incubated at 37°C for 24 hours. A part of the discharge was cultured on Sabouraud's dextrose agar slant (with chloramphenicol 0.05) and was examined for gross and the microscopic morphology of the fungi.

The organisms were identified by using a standard procedure (Collee et al).[3] The organisms were identified by using a standard procedure (Collee et al).[9] Thus collected data was analyzed using Microsoft exel software. (Trial Version).

RESULTS

Out of 140 samples 114 (81.43%) had positive culture. out of 114 cases 64 (56.14%) were male. Out of 114 positive cases 37 (32.45%) patients were in the age group of 0-14 years, 35 (30.70%) patients were in the age group of 15-29 years, 31 (27.19%) were in the age group of 30-44 years and 11 (9.64%) patients were in the age group of 48 years and more. Maximum cases were seen the 0-14 years age group (Table 1).

Table 1: Distribution of positive cases according to age group.

Age group	Male	Female	Total
0-14	19 (16.66%)	18 (15.78%)	37 (32.45%)
15-29	25 (21.92%)	70 (8.77%)	35 (30.70%)
30-44	15 (13.15%)	16 (14.04%)	31 (27.19%)
48 and above	5 (4.38%)	6 (5.26%)	11 (9.64%)
Total	**64 (56.14%)**	**50 (43.85%)**	**114**

Out of 114 positive cases of otitis media single organism was isolated in 99 (86.8%) cases. Two organisms were isolated in 15 (13.2%) cases. Out of total 129 strains 44 (37.9%) were gram positive, 72 (62.1%) were gram negative organisms and 13 (10.07%) (Table 2).

Table 2: Distribution of organism.

Type of organism	Number	Percentage
Gram negative	72	55.81
Gram positive	44	34.12
Fungus	13	10.07
Total	**129**	**100.0**

Out of total 13 strains of fungus isolated 6 (46.15%) were Candida albicans and 7 (53.84%) were *Aspergillus niger*. *Aspergillus niger* is predominant isolated fungus as compared to *Candida albicans*. Isolation of *Aspergillus niger* was only seen in adults (Table 3).

Table: 3 Distribution of fungus according to age group.

Organism	Pediatric age group	Adult	Total
Candida Albicans	2 (15.38)	4 (30.76)	6 (46.15)
Aspergillus niger	0 (0.0)	7 (53.84)	7 (53.84)
Total	**2 (15.38)**	**11 (84.61)**	**13 (100)**

Figures in the parenthesis are percentage.

DISCUSSION

In our study, Majority of the patients (30.70%) were less than 14 years of age, which is in agreement with the previous literature.[10,11] In contrast, Loy et al showed the

increased prevalence of otitis media in 30 - 40 years age in his study.[12] In our study, 56.14% were males. Thus males were affected more in our study which is in accordance with Ahmed et al who showed 57.3% male and 42.7% female affected by otitis media but differ from.[7] Loy et al, in our study monomicrobial growth was seen in 86.8% of cases, which is similar to the previous study by Agarwal et al.[12,13] In our study, 26 samples (18.57%) showed no growth. This was differ from Vijaya et al who found 5.28% sterile samples in their study whereas Fatma et al (16.9%) and Chakraborty et al (12.6%) found higher percentage of culture negative samples in their studies.[14-16]

In our study out of total 13 strains of fungus isolated 6 (46.15%) were *Candida albicans* and 7 (53.84%) were *Aspergillus niger*. *Aspergillus niger* is predominant isolated fungus as compared to *Candida albicans*. Loy et al also found that fungi accounted for 8.8% of the isolates and that the fungal organisms which were commonly isolated were *Aspergillus sp* (33.3%), followed by Candida sp (22.2%).[12] Proctor et al studied 215 cases and obtained a maximum growth of *Candida* in 42.8% cases and a maximum growth of *Aspergillus* in 30.9% cases. This may be attributed to the environmental effect (hot and humid) on the cases of otitis media which were studied in this area.

CONCLUSION

Aspergillus niger and *Candida albicans* were found to be the common fungal causes of otitis media in this study.

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REFERENCES

1. Nussinovitch M, Rimon A, Volovitz B, Raveh E, Prais D, Amir J. Cotton-tip applicators as a leading cause of otitis externa. Int J Pediatr Otorhinolaryngol. 2004;68:433-5.
2. Brook I, Saantosa G. Microbiology of chronic suppurative otitis media in children in Surabaya, Indonesia. Int J Peditr Otorhnolarygol. 1995;31:23-8.
3. Verhoeff M, Veen EL, Rovers MM, Sanders EA, Schilder AG. Chronic suppurative otitis media: a review. Int J Pediatr Otorhinolaryngol. 2006;70:1-12.
4. Bluestone CD, Klein JO. Microbiology. In: Bluestone CD, Klein JO, eds. Otitis Media in Infants and Children. 3rd ed. Philadelphia, PA: W. B. Saunders; 2001:79-1014.
5. Ologe FE, Nwawolo CC. Chronic suppurative otitis media in school pupils in Nigeria. East Afr Med J. 2003;80:130-4.
6. Daly A. Knowledge and attitude about otitis media risk: implication for prevention. J Pediatr. 1997;3(100):93-6.
7. Ahmad A, Usman J, Hashim R. Isolates from chronic suppurative otitis media and their antimicrobial sensitivity. Pak Armed Forces Med J. 1999;49:82-5.
8. Arol B. Antibiotics for upper respiratory tract infection. J Respir Med. 2005;99(3):250-5.
9. Collee JG, Duguid JP, Fraser AG, Marmion BP, Simmons A. Laboratory strategy in the diagnosis of infective syndromes. 14th ed. Mackie and McCartney Practical Medical Microbiology. Churchill Livingstone: Singapore. 1996: 53-94.
10. Shyamala R, Reddy PS. The study of becteriologigal agents of chronic suppurative otitis media: Aerobic culture and evaluation. J Microbiol biotech Res. 2012;2:152-62.
11. Gulati J, Tandon PL, Singh W, Bais AS. Study of bacterial flora in chronic suppurative otitis media. Indian J Otolaryngol Head Neck Surg. 1969;2:198-202.
12. Loy AH, Tan AL, Lu PK. Microbiology of chronic suppurative otitis media in Singapore. Singapore Med J. 2002;43:296-9.
13. Agrawal A, Kumar D, Goyal A, Goyal S, Singh N, Khandelwal G. Microbiological profile and their antimicrobial sensitivity pattern in patients of otitis media with ear discharge. Indian J Otol. 2013;19:5-8.
14. Vijaya D, Nagarathnamma T. Microbiological study of chronic suppurative otitis media. Indian J Otol. 1998;4:172-4.
15. Fatma AA, Assiry S, Siraj MZ. Microbiological evaluation and aspects on management of chronic suppurative otitis media in Riyadh. Indian J Otol. 1998;4:115-20.
16. Chakraborty A, Bhattacharjee A, Purkaystha P. Microbiological profile of chronic suppurative otitis media: Its significance in North-East India. Indian J Otol. 2005;11:39-44.
17. Proctor B. Otolaryngology in Paparetta and Shumrick. Phildephia. W.B. Saunders Co. 1973: 1455-89.

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