Fungal and Bacterial Flora of Chronic Suppurative Otitis Media in Amritsar (Punjab)

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Abstract

Ear discharge specimens from 182 clinically diagnosed cases of chronic suppurative otitis media were cultured for isolation of fungi and bacteria. Positive fungal cultures were obtained in 13.7 % ; present alone in 7.6% and in combination with various bacteria in 6.1%. Bacteria alone were present in 60.4% cases. The fungal isolates were *Candida albicans* (60%) and *Aspergillus* (40%). Bacterial isolates showed the predominance of *Pseudomonas aeruginosa* (44.8%) followed by *Staphylococcus aureus* (20.4%). Newer antibiotics like Cefotaxime, Gentamicin and Ciprofloxacin were found to be more effective against all the gram positive and negative isolates.

Chronic suppurative otitis media is a persistent disease of middle ear capable of causing severe destruction and irreversible sequelae with manifestations of deafness and discharge (Shenoi, 1988). Review of literature showed that many authors (Tulsi Das, 1954, Baruah et al, 1972 and Ojala et al 1981) had focussed their attention on the bacterial flora of chronic suppurative otitis media. but very little is known about the mycological aspects of these ears, the importance of which has been increasing in the recent years because of the excessive use of broad spectrum antibiotics, corticosteroids and cytotoxic chemotherapy and increase in the number of immune deficiency conditions. The present series deals with the study of fungal flora of cases of chronic suppurative otitis media who attended the E. N. T. Out patient Department of Medical College, Amritsar from April 1994 to July, 1996.

Material and Methods

One hundred and eighty two clinically diagnosed cases of chronic suppurative otitis media (including fifty two who had undergone modified radical mastoidectomy and had used antibiotic and steroid ear drops for 15 days post-operatively) formed the subject of the study. Ear discharge from each of the diseased middle ear was collected separately in a sterilized vial using a long lumbar puncture needle after creating negative pressure. The samples were immediately sent to the Microbiology laboratory for fungal and bacterial studies. In the laboratory, a drop of the ear discharge was examined microscopically (in 10% potassium hydroxide) for the presence of epithelial cells, pus cells, budding yeast cells and fungal hyphae and spores etc. A part of the discharge was cultured on Sabouraud's glucose agar slant (with chloramphenicol 0.05 mg / ml) and was incubated at 27°C for 21 day. The tubes showing positive

cultures were examined for gross and microscopic morphology of fungi.

For bacterial isolation, samples were inoculated on blood agar and macConkey's agar medium and were incubated at 37°C for 24 hours. The organisms were identified using standard procedure (Collee et al, 1989). Antibiotic sensitivity of the isolated bacteria was studied by disc diffusion method.

Results and Discussion

Amongst the 182 cases of chronic suppurative otitis media studied, 119 (65.4%) were in the second and third decades of life and 27 (14.8%) were children below the age of 10 years. There was predominance of males over females (ratio 3 : 2). The disease was found to be more common in lower and middle socio-economic strata of society with an urban, rural ratio of 1 : 2. In majority (86.3%) of the cases, the disease was unilateral and the duration of illness was more than one year in 64.2%. Almost all the cases present with more than one symptom (otorrhoea, diminution of hearing and otalgia) and history of local treatment in the form of antibiotic and / or steroid ear drops. Seven were known diabetics and 4 were on antitubercular treatment.

Results of the mycological and bacteriological studies of 182 cases (Table I) showed that

fungal culture was positive in 25 (13.7%). While combined growth of fungi and bacteria was obtained in 11 (6.1%), fungi alone were present in 14 (7.6%) and bacteria alone in 110 (60.4%). Forty seven (25.8%) cases were negative for both fungi and bacteria. The corresponding figures reported by Sen Gupta et al (1978) were 24.8%, 13.6%, 11.2%, 66.4% and 8.6% respectively. The difference could be due to the difference in the patient population studied and geographical variations.

Of the 25 fungal isolates (Table II), 15 (60%) were candida species (*Candida albicans*). *Aspergillus* was isolated in 40% with maximum strains (16%) of *Aspergillus fumigatus*. Proctor et al (1973) studied 215 obtained the growth of candida in 42.8% and *Aspergillus* in 30.9%. Of the 18% fungi isolated by Baruah et al (1972) 27.8% were candida species and 50% were *Aspergillus*. Sen Gupta et al (1978) reported the presence of 74.2% *Aspergillus* species, 19.35% candida and 6.4% penicillin in chronic suppurative otitis media. Analysis of bacterial flora of the present study showed predominance of gram negative bacilli (71.6%). The highest incidence (44.8%) was that of *Pseudomonas aeruginosa* followed by *Staphylococcus aureus* (20.4%). Other bacterial isolates were *Klebsiella* 14.1%, *Escherichia coli* 7.8%, *Proteus*

Table - I
Age distributions and culture results of 182 cases of chronic suppurative otitis media

Age in years	Results of fungal and Bacterial cultures			
	Fungal and Bacterial Positive.	Fungal and Bacterial Negative	Fungal Positive Bacterial negative.	Fungal Negative Bacterial positive.
≤ 10	2	0	3	22
11-20	5	13	2	37
21-30	4	18	4	35
31-40	0	16	4	11
> 40	0	0	1	5
Ttotal	11	47	14	110

Table - II
Various fungi isolated in chronic suppurative otitis media

Fungus isolate	No.	Percentage
Candida	15	60
Candida albicans	15	60
Aspergillus	10	40
Aspergillus flavus	2	8
Aspergillus fumigatus	4	16
Aspergillus miger	3	12
Aspergillus terreus	1	4
Total	25	100

4.7%, Strepto haemolyticus and diphtheroids (3.1%) each and streptococcus pneumoniae 1.6%. In 1981 Ojala et al reported the isolation of 10% pseudomonas and 22% Staph aureus strains. Increased rate of isolation of pseudomonas aeruginosa has its own implications as this organism is an important cause of nosocomial infections and has developed resistance to even many potent antibiotics.

Antibiotic sensitivity of the isolated bacteria to various antibiotics (Ampicillin, Erythromycin,

Cephlexin, Cefatoxime, Gentamicin, Ciprofloxacin and in certain cases-Amikacin, Tobramycin, Neitmicin) showed that comparatively newer antibiotics like cefatoxime, ciprofloxacin and gentamicin were more effective against all the isolates. Ciprofloxacin which could be used both systemically and locally showed 60.6% sensitivity to pseudomonas, 63.6% to staph aureus, 61.5% to Klebsiella and 100% to Esch-coli. Sensitivity of low cost parenteral aminoglycoside, gentamicin to S. aureus, Esch-coli, Klebsiella and pseudomonas was 78.5%, 72.7%, 69.2% and 27.2% respectively. Amikacin was found to be sensitive to all the pseudomonas strains which were resistant to ciprofloxacin and other antibiotics.

The present study thus indicates that regular laboratory examination with a definite search for fungi is desirable in all the cases of chronic suppurative otitis media. Since prolonged use of broad spectrum antibiotics and / or steroid ear drops may cause suppression of bacterial flora and subsequent emergence of fungal flora, routine use of topical antibiotics if chronic suppurative otitis media at the onset is not justified. These cases must be given a trial of treatment in the form of local toilet in addition to treating underlying factors.

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