Original Article

Otitis Media

Prevalence of Bacteria and their Sensitivity to Various Antibiotics in Chronic Suppurative Otitis Media

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ABSTRACT

Objective: The purpose of this study was to find out the most common strains of bacteria encountered in chronic suppurative otitis media and their sensitivity to various antibiotics.

Study Design: Retrospective, analytic study

Place and Duration of Study: This study was conducted on out patients presenting to ENT department at Liaquat University Hospital Hyderabad, Sindh- Pakistan from January 2011 to June 2011.

Materials and Methods: This study was conducted jointly at ENT Unit II in collaboration with Oral and Maxillofacial surgery Department LUMHS with the help of microbiology laboratory of Liaquat University Hospital, Hyderabad, Sindh, Pakistan. The study was conducted for the period of 6 month A total of hundred samples of ear discharges were collected and analyzed for bacterial growth; and sensitivity towards various antibiotics were determined by using standard microbiological techniques using disc diffusion method.

Results: Among hundred patients, 59% were male and 41% females. Age of patients varied from 2 to 60 years. There were different species of bacteria isolated. Pseudomonas aeruginosa (46%) was the most frequent organism followed by staph aureus (27%) and proteus (27%). The prevalence of gram negative bacterium was greater than gram positive. Among the antibiotics, ciprofloxacin and enoxacin were found to be the most effective against these organisms.

Conclusion: Early and precise diagnosis of infective disease of ear is decisive in order to administer the correct antibiotic therapy and avoid complications.

Key Words: Bacterium. Otitis Media. Culture. Sensitivity. Antibiotics.

INTRODUCTION

Chronic suppurative otitis media (CSOM) involves a cycle of inflammation, ulceration, granulation and infection in the middle ear. There will be a purulent discharge through a perforated tympanic membrane present for more than 6 weeks, conductive hearing loss and often, inflammation of the mastoid cavity. Complications include hearing loss, mastoiditis, cholesteatoma, facial nerve paralysis, meningitis, brain abscess and sigmoid sinus thrombosis. Chronic Suppurative Otitis media (CSOM) is a chronic infection of middle ear, defined as otorrhoea of at least 2 weeks duration in the presence of tympanic membrane (TM) perforation[1] .It is a disease of poverty [2], common in all age groups of our population , most frequent between 10 and 30 years of age. Children with prolonged periods of hearing loss due to recurrent a cute otitis media or chronic otitis media may have in paired development of speech, language and cognitive skills, associated social problems, and also significant emotional and financial stress on families.[3,4] children living in Communities with limited access and financial to medical care, the burden of otitis media is much greater[5,6].

Clinically otitis media produce different clinical features according to duration of disease and type of exudates. Signs and symptoms of acute otitis media are fever, irritability, otorrhea, lethargy, vomiting, diarrhea and hearing loss. The appearance of the tympanic membrane may reflect the presence of middle ear effusion. The bulging membrane may be opaque and in some instances it may be erythmetous. If the membrane has perforated, a blood stained discharge from the ear may be present, who have tymparic membrane signs of otitis media, they may not have symptoms which demonstrate the insidious nature of the disease[7,8,9]. Otitis media with effusion is usually associated with bearing loss. The tympanic membrane is more often opaque with little or no mobility, otitis media with effusion may follow an episode of acute otitis media or it may occur independently.[10] If persist for more than 03 months it is considered to be chronic.

Therefore, proper knowledge of causative organism and identification of appropriate antibiotics is necessary for eradication of infection.

MATERIALS AND METHODS

All patients with at least 2 weeks of otorrhoea and TM perforation were eligible for inclusion. Exclusion criteria were current febrile illnmess, current antibiotic

use or use in preceding 2 weeks, recent ear surgery or grommet insertion. Informed consent was obtained from every patient for study purpose. An ear swab was obtained by inserting sterile swab deep in the ear canal before commencing ear cleaning. This method was selected because pathogen isolated from middle ear correlate well with those from external canal in patients with CSOM related otorrhoea. Sample of pus was collected in two consecutive swabs, one each for microscopy and other for seeding of culture. Different bacteria present were isolated by streak plate method using Nutrient Agar (NA), Maconkey Agar (MA), Sheep Blood Agar (BA) and Chocolate Agar (CA). The plates were incubated at 37°C for 24 hours. Various isolated colonies were streaked out onto the NA plates to obtain pure culture of organism isolated. Bacterial isolates were identified following the standard microbiological characteristic and biochemical properties. Antibiotic sensitivity pattern of bacteria isolates was assayed following modified Kirby Bauer disc diffusion method [5].Bacterial cells were grown at 39°C in water for about 4 hours using pure culture as inoculum. The turbidity developed was compared with that of standard barium sulphate. Broths culture was swabbed on the Mulleer Hinton Agar to achieve a lawn of confluent bacterial growth and antibiotics disc of standard concentration was placed on each plate. The plates were included for 18 to 24 hours. Organisms were classified as sensitive and non-resistant to antibiotics. Organism considered being of intermediate resistance scored as sensitive. Antibiotics tested included Ciprofloxacin, ampicillin, Co-Amoxiclav, Cephridine and Enoxacin.

RESULTS

Among 100 patients 59 were male, 41 were females shown in figure 1, age of patients varied from 2 to 60 years. Out of total discharge samples analyzed, 72% showed positive growth.

Among the positive growths, 72% samples showed single isolate while in 28% samples, there was growth of multiple isolates. The pattern of microbial isolates among the positive culture. Showed that 79% were gram negative while 21% gram positive bacteria. The organisms isolated were pseudomonas aeruginosa (46%), staph aureus (27%), and proteus (27%)shown in table 1 .With regard to the susceptibility of isolates towards various antibiotics, Ciprofloxacin and Enoxacin when given orally were most effective while Ampicillin, Cephradine and Co-amoxicalav were least effective.

Table No. 1: Showing nature of growth of organism

Nature of Growth	%
Positive growth	72%
Negative growth	28%

Table No. 2: Showing Organisms isolated

Organism Isolated	%
Pseudomonas aeruginosa	46%
Staph:aureus	27%
Proteus species	27%

DISCUSSION

The World Health Organization (WHO) estimates that 65–330 million people worldwide are affected by CSOM, the majority in the developing world. In Britain, 0.9% of children and 0.5% of adults have CSOM. It is important in the management of chronic suppurative Otitis media without Cholesteatoma to know the causative organism and their sensitivity to antibiotics. In cases of CSOM with Cholesteatoma in which still appropriate antibiotic helps in management together with surgery. The study deals with Bacterial analysis of ear discharge, isolate and identification of different bacteria and antibiotic sensitivity pattern of isolates.

This study showed that 72% samples had positive growth. This study also led to the isolates of organism comprising 13 different species. Pseudomonas aeruginosa were recovered from majority of patients (46%) followed by staph aureus (27%) and proteus (27%). The isolates were most sensitive towards Ciprofloxacin followed by Enoxacin. The Ampicillin was found to be least effective antibiotic for all bacterial isolates.

A study carried out at university of Karachi Pakistan to analyze the organism from the culture of ear swab and their sensitivity to various antibiotics have shown that out of 267 swab examined, major organism isolated is pseudomonas aueroginosa (40%) followed by staph areus (30.9%). The sensitivity of pseudomonas was 85% to ciprofloxacin [11]

Various national and international studies done have also found pseudomonas aeruginosa as most common organism isolated in chronic suppurative otitis media.[12-15] Study done on Aboriginal children having Ch:suppurative otitis media has shown that most frequent organism involved is pseudomonas aeruginosa and ciprofloxacin as the most effective antibiotic against these when used typically as ear drops[16]. Other studies in Pakistan have mentioned acceptable clinical results against pseudomonas aeruginosa by ciprofloxacin in chronic suppurative otitis media[17 to 22].

CONCLUSION

The antibiotic sensitivity pattern of isolates showed that the most sensitive antibiotic was Ciprofloxacin. Early and precise diagnosis of chronic suppurative otitis media is decisive in order to administer the correct antibiotic therapy and avoid complications.

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