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CHRONIC SUPPURATIVE OTITIS MEDIA;
EMPIRIC QUINOLONES IN CHILDREN

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ABSTRACT... Objective: The aim of the study was to determine the most prevalent organisms in chronic otitis media in children and their susceptibility to various antibimicrobials so that an appropriate empiric antibiotic can be started promptly while awaiting the results of the culture and sensitivity. **Design**: Prospective observational study. **Place and Duration of Study:** The study was conducted at Combined Military Hospital Lahore from Jan 2006 to Dec 2007. **Subject and Methods:** A total of 156 patients less than 15 years of age who were having discharge from one or both ears for at least 1 week with tympanic membrane perforation were included in the study.A sample of the ear discharge was collected on the swab and cultured on appropriate media. The Gram positive organisms were identified on the basis of Gram staining, catalase and coagulase test, the Gram negative organisms were identified by API 20e. A total of 156 patients were included in the study of which 96(61.5%) were males and 59(37.8%) were females. The organisms isolated were *Staphylococcus aureus* in 79(50.6%), *Pseudomonas aeruginosa* in 45 (28.8%) patients and *Proteus mirabilis* 17 (10.9%), *Escherichia coli, Acinetobacter sp and streptocci* were isolated in occasional patients. *Staphylococcus aureus* was the commonest organism isolated followed by *Pseudomonas aeruginosa* and *Proteus mirabilis* Fifty four. (34.6%)of *Staphylococcus aureus* were sensitive to gentamicin, fifty two (33.3%) to ciprofloxacin and 42 (26.9%)% to both ciprofloxacin and gentarnicin. Among the Pseudomonas aeruginosa isolates 40 (25.6%) were sensitive to gentarnicin, 27(17.3%) to ciprofloxacin and 22 (14.1%) to both ciprofloxacin and gentarnicin. Out of 156 patients 91(58.3%) had isolates which were sensitive to ciprofloxacin and 62(39.7%) were resistant to it. One hundred fourteen patients (73.1%)had isolates which were sensitive to gentamicin whereas 33(21.2%) were resistant. Similarly 35 isolates (22.4%) were sensitive to sulphamethoxazole/trimethoprim whereas 66(42.3%) were resistant. Among Proteus mirabilis isolates 12 were sensitive to gentamicin, 11 were sensitive to ciprofloxacin and 11 were sensitive to both ciprofloxacin and gentamicin. **Conclusion**: Ciprofoxacin ear drops can be recommended to be given empirically in children with chronic discharging ears. The initial therapy can be modified and appropriate therapy started if the result of the culture and sensitivity report shows the isolate to be resistant to the antibiotic started empirically.

INTRODUCTION

Chronic suppurative otitis media is a common infectious disease in both developing and industrialized countries[1,2,3]. The term chronic otitis media includes recurrent episodes of acute infection and a prolonged duration of middle ear effusion usually resulting from a previous episode of acute infection[4]. It causes considerable morbidity and is a major global cause of hearing impairment in children. Moreover it may lead to serious extracranial and intracranial complications like mastoiditis and meningitis[5,6]. In order to avoid serious complications an active and prompt approach in the management of chronic suppurative otitis media is mandatory[7]. However in order to start appropriate therapy according to the causative organisms and its sensitivity to various antibiotics we have to wait for 48-72 hrs for the culture and sensitivities report.

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Delaying the therapy for 2 to 3 days may further aggravate symptoms of the patient or may contribute to long term complications.

Despite being so common there are still many questions and controversies concerning the best treatment option for children suffering from chronic ear infections. The aim of this study was to determine the most prevalent organisms in chronic otitis media in our set up and their sensitivity to various antimicrobials so that an appropriate therapy can be started promptly while awaiting the results of the culture and sensitivity of the isolate to various antibiotics. Once the result of the culture is available the antibiotic being given to the patient may be modified if required.

PATIENTS AND METHODS

Setting and Participants

This prospective observational study was conducted at combined military hospital, Lahore from Jan 2006 to Dec 2007. In the study a total of 156 patients less than 15 years of age who were having discharge from one or both ears for at least 1 week with tympanic membrane perforation were eligible for inclusion in the study.

Exclusion criteria

Current febrile illness, current antibiotic use, allergy to ontological medications and specific allergy to fluoroquinolones, recent ear surgery, or an in-situ grommet or tympanostomy tube, mastoid surgery in preceding 12 months, congenital ear or hearing problems, obstructed middle ear(e.g, polyp).

Method

An informed consent was obtained from the parents of each child. A sample of the ear discharge was collected on the swab before starting the antibiotics and cultured on Mac Conckey agar (Oxoid Ltd, England) and blood agar (Mast diagnostics, UK) and incubated aerobically at 37 degree C for 24-48 hrs. Gram positive organisms were identified on the basis of colony morphology, Gram staining, catalase and slide/tube coagulase test. The Gram negative organisms were identified by oxidase test and API 20e (Biomerieux, France). The sensitivity of the isolates to various antibiotics was tested by Kirby Bauer disk diffusion technique in accordance with the Clinical and Laboratory Standards Institute (CLSI) guidelines using commercially available antimicrobial disks(oxoid, Basingstoke,UK). Following antibiotics were used: Ampicillin 10mcg, ciprofloxacin 5mcg, sulphamethoxazole/ trimethoprim (co trimoxazole) 25mcg, gentamicin 30mcg.

RESULTS

A total of 156 patients were included in the study of which 96 (61.5%) were males and 60 (38.9%) were females. Male to female ratio was 1.6:1. The mean age of the patients were 3.47 years (SD 2.45 years) and the age of the patients ranged between 6 months and 13 years. Figure-1 the age distribution of the patients. The discharge was present in both ears in 70 patients (44.87 %) whereas it was unilateral in 86 patients (55.1)%. The organisms isolated were Staphylococcus aureus in 79 (50.6%) patients, Pseudomonas aeruginosa in 45 (28.8%) patients and Proteus mirabilis in 17 (10.9%) patients. Escherichia coli, Acinetobacter species and streptococci were isolated in occasional patients. Staphylococcus aureus was the commonest organism isolated followed by Pseudomonas aeruginosa and Proteus mirabilis.

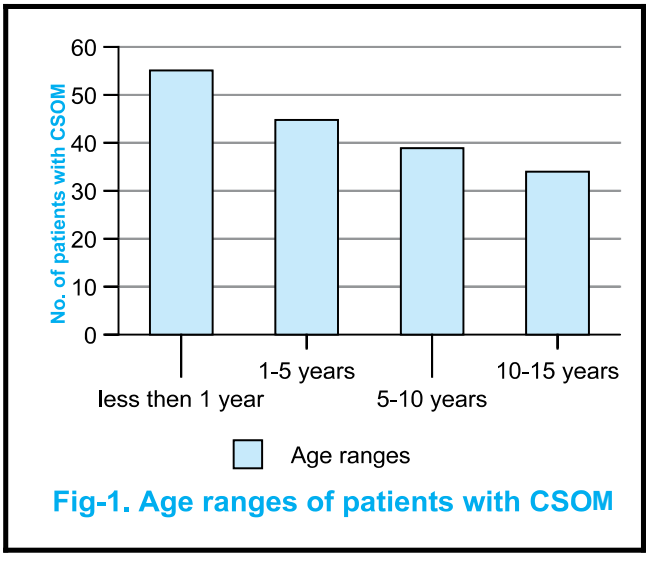

Fig-1. Age ranges of patients with CSOM

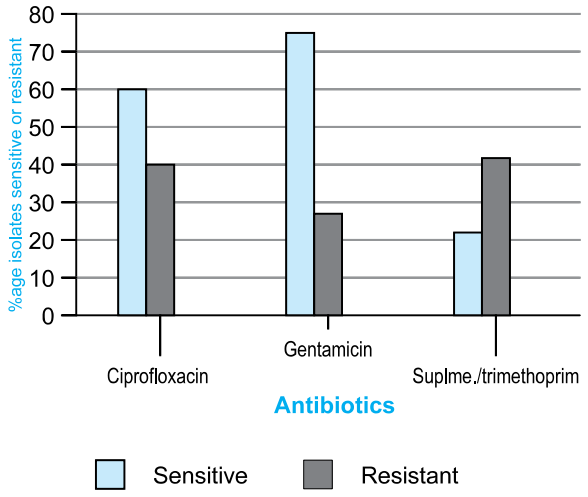

Fig-2. Sensitivity pattern of isolates in patients with chronic suppurative otitis media (n=156)

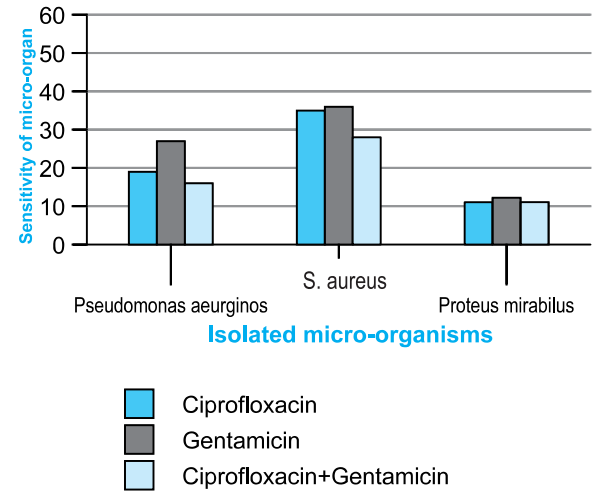

Fig-3. Sensitivity pattern of micro-organisms isolated from paediatric patients with CSOM

Fifty four (34.6%) of Staphylococcus aureus isolates were sensitive to gentamicin, 52 (33.3%) were sensitive to ciprofloxacin and 42 (26.9%) to both ciprofloxacin and gentamicin. Among Pseudomonas aeruginosa 40(25.6%) were sensitive to gentamicin 27(17.3)% to ciprofloxacin and 22(14.1%) to both ciprofloxacin and gentamicin. Figure-2 and 3 show the sensitivity of the isolates to various antibiotics.

Out of 156 isolates ninety three isolates (59.6%) were sensitive to ciprofloxacin and 63 (40.3%) of isolates were resistant to it. One hundred and fourteen (73.1%) of our patients had isolates which were sensitive to gentamicin whereas 33 (27%) were resistant. Similarly 35 isolates (22.4%) were sensitive to co-trimoxazole whereas 66 (42.3%) were resistant. Sensitivity of Pseudomonas aeruginosa to co-trimoxazole was not tested because of the genetic resistance of the organism to this antibiotic Among Proteus mirabilis isolates 12 were sensitive to gentamicin, 11 were sensitive to ciprofloxacin and 11 were sensitive to both ciprofloxacin and gentamicin. Other antibiotics for which the sensitivity of Pseudomonas aeruginosa was tested were ceftazidime and cefoperazone/sulbactam to which all the isolates were sensitive.

DISCUSSION

The result of our study shows that Staphylococcus aureus is the commonest organism isolated in chronic suppurative otitis media (csom) followed by Pseudomonas aeruginosa and then Proteus mirabilis. The same organisms are reported to be the predominant organisms isolated in csom in previous studies[8,9]. Despite being a common ear ailment the treatment given to the patient differs within our hospitals as well as by the general practitioners. However generally quinolone ear drops when used with or without steroids have been found to be effective for the treatment of acute and chronic middle ear infections[10,11].

Previously amoxicillin or ampicillin were used for acute and chronic middle ear infections in our set up keeping in view the low cost of the antibiotics as compared to quinolones. Also the clinicians wanted to avoid the use of quinolones due to their adverse effects on cartilage in growing children after prolonged and repeated usage. However it has been documented that quinolones can be used if required in children without any apprehensions[12]. Sagal[13] has compared and recommended the use of amoxicillin ear drops in csom with or without dexamethasone. In our study more than 50% of our

isolates were Pseudomonas aeruginosa which are genetically resistant to ampicillin or amoxyicillin so these penicillins are not the treatment of choice for the patients with these isolates. Moreover most of our other isolates (Staphylococcus aureus, Proteus mirabilis etc) were resistant to these penicillins. Hence ampicillin or amoxicillin cannot be recommended to be given empirically in our patients with csom. As compared to these penicillins ciprofloxacin seems to be more suitable to be given empirically in our patient keeping in view the higher degree of sensitivity of our isolates to this antibiotic. Dohar et al[14] have also found the use of ciprofloxacin superior to amoxicillin in otitis media. Keeping in view its sensitivity gentamicin ear drops can be recommended to be given empirically in our patients. However the concern about ototoxicity has restricted their use and quinolone ear drops are said to be more effective and safer than aminoglycosides[15]. Van der Veen et al[16] have experimented using trimethoprim/ sulphamethoxazole ear drops for 6-12 weeks and documented that ottorhea resolved in 75% of his patients. However there seems to be some discrepancy in the results as he reports that 38% of the isolates in his study were Pseudomonas aeruginosa which are genetically resistant to trimethoprim/ sulphamethoxazole and hence not effective at all. Previously it was thought that antibiotics were not effective in treating acute and chronic otitis media and hence recommended that no antibiotics to be given to these patients[17]. It was believed that both sinusitis and ear infections are self limiting diseases and advised only local decongestants and pain killers for acute as well as chronic ear ailments. However continuous research and trial in patients with chronic otitis media have found that topical quinolones can clear aural discharge better than no drugs or only aural antiseptics[18].

CONCLUSION

Keeping in view the high prevalence of Staphylococcus aureus and Pseudomonas aeruginosa in our set up and their high degree of susceptibility to quinolones, ciprofloxacillin ear drops can safely be recommended to be given empirically in children with chronic discharging ears. The initial therapy can be modified and appropriate therapy started if the result of the culture and sensitivity report shows the isolate to be resistant to the quinolone started empirically.

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