ORIGINAL ARTICLE

MICROBIOLOGY AND DRUG SENSITIVITY PATTERN IN CHRONIC SUPPURATIVE OTITIS MEDIA IN A TERTIARY CARE HOSPITAL OF KP

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ABSTRACT

Objective: To find out the frequency and drug sensitivity of different bacteria causing chronic suppurative otitis media (CSOM) in adult patients visiting a tertiary care hospital in Peshawar, KP.

Material and Methods: This is a descriptive cross sectional study, carried out at ENT Department, Khyber Teaching Hospital, Peshawar, Pakistan from February 2015 to January 2016. One hundred and twenty-eight ear swabs were taken from patients diagnosed as cases of chronic suppurative otitis media on the basis of history and clinical examination, who have not taken any local or systematic antibiotic treatment for the last one week. Patients taking steroids or suffering from any co morbidity like chronic renal failure, diabetic's mellitus or any disease which may affect the immune system were excluded from the study.

Results: Out of total 128 ear swabs, 51.5% shows Pseudomonas aeruginosa, 29% staphylococcus, 12% proteus, while E. Coli, Klebsella, and streptococcus pneumonia were the less commonly involved organisms. Regarding the sensitivity of antibiotics 90% were sensitive to ciprofloxacin, 88% to amikacin and 83% to ceftazidime.

Conclusion: Pseudomonas aeruginosa and staphylococcus aureus were the commonest organism causing CSOM. Ciprofloxacin can still be found to be the most potent antibiotic against all common pathogens.

Key Words: Chronic, suppurative, otitis media, microbiological culture, antibiotics.

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INTRODUCTION

Chronic suppurative otitis media is suppuration of middle ear cleft and its mucosal lining with a non-intact tympanic membrane for a minimum period of three months[1].Chronic suppurative otitis media is a continuous source of concern to the otolaryngologists. Incidence of CSOM is higher in developing countries because of poor socio-economic standards, poor nutrition and lack of health education. It affects both sexes and all age groups[2]. It is also the single most important cause of hearing impairment in rural population. Chronic suppurative otitis media is the disease that may occur at any age, however youngers are more susceptible to ear infection and its complications due to less resistance, greater incidence of upper respiratory tract infections, overcrowding and low socio-economic status[3]. Multiple inter related factors, contribute to the development of otitis media of which infections, allergy and barotrauma being the main causes[4]. Clinically it is divided into two types, tubotympanic and atticoantral. Chronic suppurative otitis media may lead to both intracranial and extra cranial complications. The close relationship of middle ear cleft to the facial nerve, auditory labyrinth and posterior cranial fossa makes it easy for complications to develop[5]. These complications may lead to disability and handicap. Most of the developing countries lack accurate data for chronic suppurative otitis media and its complication[6]. Chronic suppurative otitis media has got mixed flora involvement both gram positive and gram negative aerobes and anaerobes[7]. This study contributes to practice of evidence based medicine, avoiding antibiotic resistance and their effectiveness. Radical surgery even at the expense of hearing loss was a frequent practice to prevent these complications in the

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past. But with the advent of antibiotics that approach has been changed considerably.

MATERIAL AND METHODS

This descriptive cross sectional study was carried out at ENT Department of Khyber Teaching Hospital, Peshawar, Pakistan from February 2015 to January 2016. One hundred and twenty-eight ear swabs were taken from patients diagnosed as a case of chronic suppurative otitis media on the basis of history and clinical examination, who have not taken any local or systemic antibiotics for the last 1 week. Patients taking steroids or suffering from any other comorbidity like chronic renal failure diabetes mellitus or any disease which may affect the immune system were excluded from the study. Ear swabs where taken from the patients with aseptic technique and were sent to single laboratory where ear sample were incubated for 72 hours. A statistical program for social science (SPSS-13) was used to analyze data. Frequency and percentage were computed for categorical variables like sex, microorganisms and sensitivity pattern.

RESULTS

The age and sex distribution of the cases is shown in Table 1 and 2 respectively. Socio-Economically 70 patients (54.6%) were of lower socioeconomic status while 50 patients (39%) were of middle socioeconomic status while 8 (6.3%) were of upper socioeconomic status. Table 3 shows results of culture obtained and type of microorganisms involved is shown in Table 4. Regarding sensitivity to antibiotics, ciprofloxacin (90%) is effective against Pseudomonas, followed by amikacin (88%), ceftazidime (83%), minocin (80%) and gentamicin (58%), while against staphylococcus aureus ciprofloxacin (89%) is effective followed by minocin (81%), meronem (80%), gentamicin (71%), amoxicillin + clavulanate (68%) and cotrimoxazole is (15%).

Table 1: Age wise distribution

S. No.	Age in years	No. of patients with %age
1.	10-20	70 (54.6%)
2.	21-30	50 (39.0%)
3.	31-50	8 (6.3%)

Table 2: Gender wise distribution

No. of patients	Gender with %age
84	Male (65.6%)
44	Female (34.4%)

Table 3: Results of Culture Obtained in chronic suppurative otitis media

Organisms	Total cases with %age
Pure Culture	98 (76.56%)
Mixed Culture	22 (17.18%)
No Growth	08 (6.25%)

Table 4: Types of micro Organisms involved in chronic suppurative otitis media

Pseudomonas aeruginosa	66 (51.5%)
Staphylococcus Aureus	38 (29.5%)
Proteus	16 (12%)
Klebsiella	5 (3.9%)
Escherichia Coli	3 (2.3%)

DISCUSSION

Our study is based on the objective to know the frequency of various causative bacteria causing CSOM and their susceptibility patterns to selected antibiotics. The knowledge of the prevailing strain and antibiotic sensitivity patterns in the region is essential to meet the challenge of CSOM. CSOM is the disease of low socio-economic group. The infection may be mixed and polymicrobial. The monobacterial isolates in 76%, and polybacterial isolates in 17% cases which is in accordance with previous studies conducted by various workers[8,9,10]. Prevalence of CSOM in Pakistan, India and Saudi Arabia is reported to range between 1% to 6%[11]. The lowest prevalence is found in developed countries like USA and UK (<1%)[12]. Chronic Suppurative Otitis Media is prevalent in all age groups and is evident from the result of various studies[13]. In our study the peak incidence of disease was seen in 10 to 20 years age group (54.6%) followed by 20 to 30 years (39%).In this study 84 patients (65.6%) were male and 44 patients (34.4%) were female. In another study male were affected more than female with a ratio of 1.79:1. The wide range of microbes in CSOM has been subjected to exhausting investigations. Earlier studies reported the predominance of gram +ve bacteria. Subsequent work stressed the wide spread presence of mixed gram +ve and gram –ve aerobic organisms in varying proportions with gram +ve dominating[14]. The prevalence of gram –ve aerobes in CSOM has cast serious douts on the earlier impression of role of nasopharynx as source of infection. An altered theory of "fecoaural"route was suggested, but other authors in careful documented study conclude that "fecoaural" route does not play a significant role in microbial colonization.

In our study pseudomonas species has been found to be the most frequent organism, while second most commonest pathogenic organism was staphylococcus aureus. Nearly similar results were obtained in other studies[15]. Proteus, Klebsiella and E.Coli followed in order of their frequencies which also match findings of others[16]. In a report 70-90% of isolates were pseudomonas, staphylococcus aureus and proteus in chronic suppurative otitis media[17]. They also found that the pseudomonas aeruginosa was not the only species identified. The aerobic organisms were on the top of different series of studies[18].

These findings correlates the results of our findings[19]. All of them reported pseudomonas, proteus,

and staphylococcus aureus as major pathogens in chronic suppurative otitis media. Regarding sensitivity to antibiotics, ciprofloxacin (90%) is effective against the organism commonly involved, followed by amikacin (88%) and ceftazidime (83%) and minocin and meronem (80%). These findings are similar to those reported in number of studies[20].

CONCLUSION

It is concluded from the present study that pseudomonas aeruginosa and staphylococcus aureus were the comment bacteria causing CSOM, while antibiotics like ciprofloxacin, amikacin, ceftazidime and meronem are highly sensitive against pseudomonas aeruginosa and staphylococcus aurous.

RECOMMENDATION

The knowledge of the prevailing strains and their antibiotic sensitivity pattern will be immensely helpful in combating the challenge of chronic suppurative otitis media in the society.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

Hafeez M: Concept and design.
Gul I: Tabulation ,Designing.
Shafiullah: Statistics
Din IU: Data collection
Arif A: Proof Reading.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.