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OTITIS MEDIA;

PREVALENCE OF GRAM NEGATIVE BACTERIA IN OTITIS MEDIA PATIENTS IN ENT WARD/OPD OF NISHTAR HOSPITAL MULTAN.

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ABSTRACT… Background and Objectives: The objective of this study is to determine pattern of bacterial isolates and their antimicrobial sensitivity pattern among patients with chronic suppurative otitis media. **Study Design:** Prospective study (descriptive cross-sectional study). **Setting:** Department of ENT and Microbiology, Nishtar Medical University and Hospital Multan. **Period:** June 2014 to December 2014. **Material and Methods:** A total of 50 patients presenting with chronic suppurative otitis media having unilateral or bilateral ear discharge were enrolled from OPD of ENT department of Nishtar Hospital. **Results:** Of these 50 patients with CSOM, 22 (44%) were male patients while 28 (56%) were female patients. Mean age of our study cases was noted to be 12.52 ± 11.53 years (ranging from 5 years to 52 years). Most burden of the disease was seen in children i.e. 25 (50%) of the patients were less than 10 years of age. During the whole study unilateral discharge was seen and table 1 shows 50 specimens of CSOM were investigated for bacterial infestation and found to be infected with different bacteria. the highest number of cases were infected with s. aureus 24 (48 %) followed by 11 pseudomonas aeruginosa (22 %), 11 proteus mirabilis (22%) and 3 E. coli (6%) patients. **Conclusions:** Due to variation in climate, community, accessibility of medical care and prescription of antibiotics, the pattern vary in CSOM patients. Therefore it is very important to identify the causative agents of CSOM and their sensitivity pattern against various antibiotics before treatment of the disease in the patients.

Key words: Otitis Media, Staphylococcus Aurous, Escherichia Coli.

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INTRODUCTION

Chronic suppurative otitis media (CSOM) is one of the most prevalent infections worldwide and is the inflammation of the middle ear drum, inner ear and Eustachian tube caused by pathogenic microorganisms that reside in the middle ear.[1,2] The infection sloley depends upon route of transmission through which infection invades middle while main routes of transmission is via Eustachian tube. According to the world health organization report 2004, general population of South East Asia harbors prevalence of chronic otitis media approximately in 5.2%. Hence it is an important public health issue of our country. This disease is very commonly reported in childhood in children because the Eustachian tube is short and more horizontal in position as compared to the adults. Moreover, children have a less developed immune system to confer sufficient resistance to bacteria. CSOM often leads to conductive and sensor neural hearing losses and may also cause negative impact on child development that in some cases leads to the death of annually over 50,000 children worldwide. The chronic form of otitis media remains common health issue in developing countries like Pakistan. High prevalence of the disease has been reported for the widespread prevalence of CSOM to be associated with different underlying socio-demographic factors like poo socioeconomic status, lack of sanitation facilities, substandard living conditions, overcrowding, poor hygienic conditions and malnutrition.[3,4]

The most common microorganisms isolated from CSOM patients are Staphylococcus aureus, pseudomonas aeruginosa, E. coli, proteus mirabilis, klebsiella pneumoniae, Aspergillus

spp and candida spp while their pattern varies greatly with respect to geographic distribution. In peripheral health centers, the culture and sensitivity facilities for discharge from ears of CSOM patients are not available and general practitioners treat the patients using their own preference of tropical eardrops and systemic antibiotics is influenced by its efficacy, resistance of bacteria. safety, risk toxicity and cost.[5,6]

Knowledge of the pattern of local Antibiogram is very important for efficient and cost effective treatment of otitis media patients.[7,8] Literature survey has revealed that such studies have been conducted in most parts of Pakistan. Therefore the main objective of this study was to address the shortfall and determine the microbial profiles, Antibiogram of CSOM patients in Nishtar Hospital Multan and compare studies conducted within Pakistan as well as the neighboring countries.

METHODOLOGY

This was the prospective study (descriptive cross-sectional study) which was performed in the department of ENT and Microbiology, Nishtar Medical University and Hospital Multan from June 2014 to December 2014. A total of 50 patients presenting with chronic suppurative otitis media having unilateral or bilateral ear discharge were enrolled from OPD of ENT department of Nishtar Hospital. Details, clinical history regarding sex, age, route of discharge and previous history of antibiotic therapy were taken and were noted in the proforma. Antimicrobial susceptibility was determined using Mueller-Hinton Agar by disk diffusion method as described by Kirby Bauer. The antimicrobial drugs tested for this purpose were; Ampicillin (30mg), Augmentin (30 ug), Ofloxacin (5 ug), cephalexin (30 ug), cephradine (30 ug), ceftrixone (30 ug), cefotaxime (30 ug) and erythromycin (10ug). These were placed aseptically on the pre-streaked agar plates using sterilized forceps. The interpretation of the measurement for sensitive and resistance bacteria was made according to the manufacturer's standard zone size. Percentage resistance and sensitive zone sizes were calculated using the formulas PR =a/bx100 and PS=c/dx100.

Frequency of bacterial species distribution amongst Nishter Hospital Multan CSOM patients.

Name of Infecting Bacteria	No. of Isolates	Percentage
Gram Positive Bacteria		
Staphylococcus aureus	24	48%
Gram Negative Bacteria		
Pseudomonas aeruginosa	11	22%
Proteus mirabilus	11	22%
Escherichia coli	3	6%
Fungal Infections		
Candida albicans	1	2%

RESULTS

Of these 50 patients with CSOM, 22 (44%) were male pateints while 28 (56%) were female patients. Mean age of our study cases was noted to be 12.52 ± 11.53 years (ranging from 5 years to 52 years). Most burden of the disease was seen in children i.e. 25 (50%) of the patients were less than 10 years of age. During the whole study unilateral discharge was seen and Table-I shows 50 specimens of CSOM were investigated for bacterial infestation and found to be infected with different bacteria. The highest number of cases were infected with s. aureus 24 (48 %) followed by 11 pseudomonas aeruginosa (22 %), 11 proteus mirabilis (22%) and 3 E. coli (6%) patients.

Age	Number
0 – 10	25 (50%)
11 - 20	12 (24%)
21 – 30	2 (4%)
31 – 40	3 (6%)
41 – 50	4 (8%)
>50	4 (8%)

Table-I. Age distribution of patients (n=168)

Sex	Number
Male	22 (44%)
Female	28 (56%)

Table-II. Sex distribution of patients

Site	Number
Right ear	18 (36%)
left ear	16 (32%)
Bilateral	16 (32%)

Table-III. Site distribution

DISCUSSION

This study was conducted on 50 suspected CSOM patients from all age groups and genders. There was an overall infestation of various bacteria of 80 % and was high as compared to other studies conducted within Pakistan, 17 in Karachi, 20 in Bahawalpur and 26 in korea and 27 in Istanbul, Turkey. The most common isolated pathogenic bacteria was S. aureus, followed by p. aeruginosa, proteus mirabilis and the least isolated organism was E.coli. In Pakistan, a study conducted in Quetta also found S. aureus was the most commonly isolated organism. similarly, high prevalence of S. aureus had been reported in a study conducted in Benin city, Edo state , Nigaria.

In Korea, the prevalence of pathogenic bacteria was 54 % amongst 2000 patients and the most common pathogenic bacteria in theire study was also S. aureus and was followed by p. aeruginosa. In Peshawar , a study conducted on 124 patients also isolated both S. aureus and p. aeruginosa and in studies from various parts of the world e.g, kota Bharu (Malaysia), Singapore, Benin city (Nigeria), Bahawalpur, Karachi (Pakistan), found p. aeruginosa as the highest common organism. Both S. aureus and p. aeruginosa are the main etiological agents of CSOM patients.

The gender wise analysis of our study shows a variation in the ratio of suspected CSOM patients and their infestation. Our findings are suspected by numerous other studies that males are at higher risk of CSOM than females but there are studies in which females have higher infestation.[9]

In the age group data analysis, the highest numbers of suspected CSOM patients were from and 11 – 20 years and the highest infestation were also found in this group. Our results are in agreement with other studies conducted both in Pakistan and foreign countries. This highest infection in < 10 years of age groups could be due to physiological, anatomical and socio-cultural reasons.

Water and soil contributes greatly in the spread of disease. CSOM is most probably caused by lack of personal hygiene due to lack of education with patients inserting objects / instruments contaminated with soil into their ears and or during swimming in dirty and stagnant water rivers. Moreover, the CSOM microbes are environmental organisms and playing with and in soil outside the homes and schools can also transmit them to the ears.[10,11]

Among these clinical isolates, sensitivity pattern exhibited by E. coli revealed that only Ofloxocine was the drug of choice in treating this pathogen with its sensitivity was 66.6% while other drugs used such as; augmentin, cephradine, cefotaxime, erythromycin, ampicillin, ceftriaxone exhibited great degree of resistance. Moreover, cephradin was entirely resistant which points towards alarming situation in our population, as in peripheral areas this drug is being widely used.

Satphylococcus aureus isolates of CSOM also exhibited higher proportions of resistance against commonly used drugs such as; ampicillin, cephalexin and cefixime were found to be highly resistant while other drugs such as augmentin, cefotaxime, cephradine, erythromycin and ofloxacin were found to be effective in terms of susceptibility was noted to be 70 to 90 % with ceftriaxone showing more than 90% sensitivity. The sensitivity pattern against p. aeruginosa and Proteus mirabilis are the worst for all the antibiotics used during this study.

Bacterial species	No. of isolates	Aug no. (%)	Oflo no. (%)	Ceph no. (%)	Ceftr no. (%)	Ery no. (%)	Amp no. (%)
s. aureus	24	15(62.5)	17(70.8)	8(33.3)	20(83.3)	16(66.6)	2(8.3)
p. aeruginosa	11	4(36.3)	2(18.8)	00(00)	03(27.2)	00(00)	2(18.1)
p. mirabilis	11	4(36.3)	2(18.8)	00(00)	3(27.2)	00(00)	2(18.1)
E.coli	3	02(66.6)	03(100)	00(00)	02(66.6)	02(66.6)	02(66.6)
Total	49	25(51.0)	24(48.9)	8(16.32)	30(61.2)	18(36.7)	8(16.32)

Amp – ampicillin, aug - augmmentin, oflo - ofloxacine
Ceph – cephlexin, ceftr – ceftrixone
Ery – erythromycine

CONCLUSION

Due to variation in climate, community, accessibility of medical care and prescription of antibiotics, the pattern vary in CSOM patients. Therefore it is very important to identify the causative agents of CSOM and their sensitivity pattern against various antibiotics before treatment of the disease in the patients.

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