

Prevalence of chronic supportive otitis media and the laboratory presentation at Nawabshah.

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Abstract:

Objective: To determine the frequency of chronic suppurative otitis media, common bacteria and antibiotic susceptibility on culture and sensitivity among patient having otorrhea.

Study design: Cross sectional descriptive

Place and duration: This study was conducted in the ENT outpatient department at PMC hospital Nawabshah, Shaheed Benazir Abad from April 2018 to September, 2018

Material & Methods:

110 CSOM patients were examined. A questionnaire was filled to obtain demographic data; sterile cotton swab was utilized forgetting ear discharge. For culture and sensitivity test.

Antimicrobial susceptibility test was performed on Mueller-Hinton agar using disk diffusion method.

Conclusion:

Streptococci species were the most dominant microbiological isolate followed by pneumococcus species. The Isolated microorganisms had higher susceptibility rate to Levofloxin and ceftriaxone.

Key words: Chronic suppurative otitis media, laboratory presentation, Streptococci, Levofloxin, ceftriaxone.

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INTRODUCTION:

Chronic suppurative otitis media (CSOM) is inflammation of the middle ear cleft. This type of disease causes discharge through tympanic perforation. WHO definition for CSOM requires only two weeks of otorrhea¹. The CSOM occurs most frequently in children. According to WHO records, at present about 330 million cases of CSOM have been reported throughout the world¹⁻³. It has also been reported that affected people frequently visited health care centers and were prescribed various types of antibiotics for treatment⁴. As mentioned earlier, 60% of the 330 million patients of CSOM have suffered hearing loss, among them the children were in majority⁵. According to WHO, the complications of CSOM were very severe that have led to the death of twenty-eight thousand people yearly¹. During initial first six years of childhood, there are chances of occurrence of CSOM. The possible reason for occurrence of this disease may be due to poor management of otitis media³. There might

be risk for severe complication that have likely to occur due to CSOM disease. In children the CSOM may cause hearing loss¹. Bad impact on communication, learning process of language. As a result, schooling physiological and cognitive development of children are highly compromised.⁵ Other complications linked with CSOM are mastoid abscess, facial nerve palsy, brain abscess and meningitis⁶. Such type of problems could be controlled by recognition of microbiological organism which are responsible for CSOM and complications related to it along with their antibiotic sensitivity^{4,5}. Microbiological findings in CSOM vary b/w studies. It has been found that that following bacterial infections have significant effect on middle ear affected by CSOM. *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Enterobacteriaceae proteus*, *Klebsella pneumonia*⁴⁻⁹. It to be noted that the surgery and hearing equipment are expensive¹⁰. Therefore, it is necessary to investigate the causative organisms and their antibiotic sensitivity so that we can control the disease at very beginning and able to prevent the fatal

complications with the help of conservative management^{11,12}. Bacteria causing CSOM and their response to different antibiotics are inconsistent.

We are conducting this study to provide recommendations regarding the choice of antibiotics, which are prescribed in the patients diagnosed with CSOM. Morbidity and mortality caused by CSOM can be reduced by early effective management which is possible if we have knowledge of common organisms and their antibiotic susceptibility in this region.

Material & Methods:

This cross sectional study was carried out at the department of ENT outpatient department (OPD) of Peoples University of Medical and Health Sciences Hospital Nawabshah from April to September, 2018. Total 110 cases were diagnosed out of these 5/ in cases culture showed no organisms.

Results:

The Prevalence of CSOM was 95%. The age range of study participant was 09 months to 60 years. In our study patients 65(59%) were children below the age of 18 while 45(40%) were adult. Male Patients were 60(54%) while 50(40%) were female. Out of 110 CSOM, 80 had unilateral CSOM while 20 had bilateral CSOM. The range of duration of ear discharge was 03 months to 09 years.

Out of 110 specimen analyzed 53(48%) were gram Positive and 47 (42%) were

gram negative and 5 culture no organism were seen. out of 53 gram positive 35 were streptococcus (gram positive cocci)15 were pneumococcus (gram Positive cocci) 03 were staphylococci (gram positive Cocci). Out of 47 gram negative 30 were Klebsilla (gram negative bacilli) 20 were pseudomonas (gram negative cocci), 02 were meningococci (gram negative diplococci).

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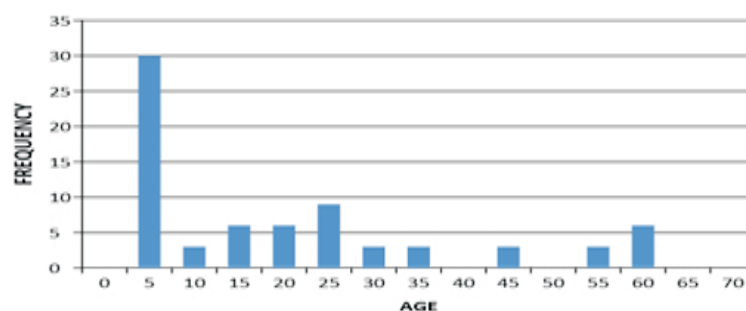


Figure 1. showing the frequencies of ages

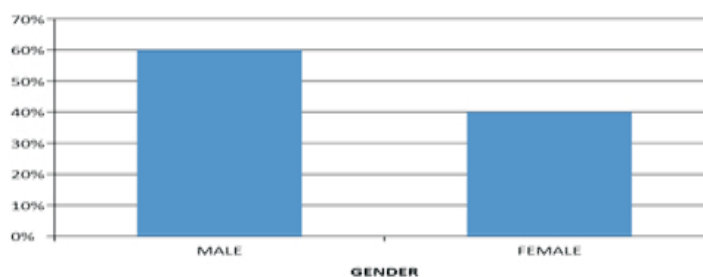


Figure 2. showing sex distributions

4.1 Laboratory Findings positive cocci) . Out of 47 gram negative 30 were Klebsiella (gram negative bacilli), 20 were pseudomonas(gram negative cocci) , 2 were meningococci (gram negative diplococcic) positive cocci) .

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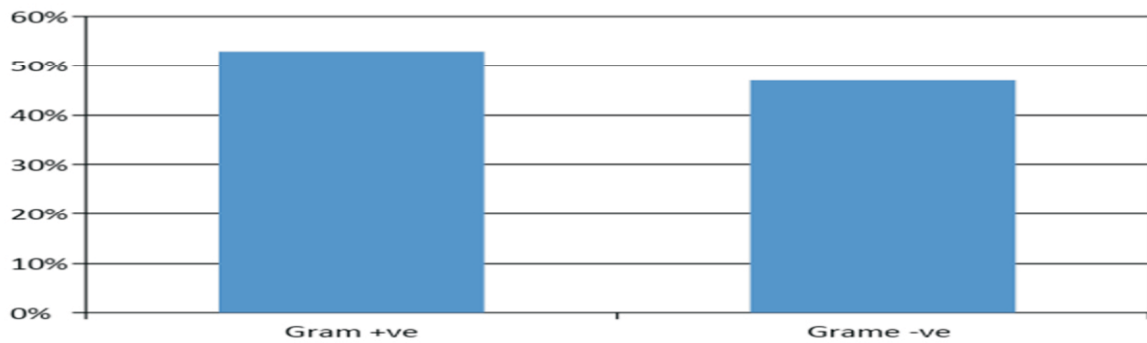


Figure 3. showing frequency of gram negative and gram positive rods and cocci bacteria

Antibiotic susceptibility testing for 35 streptococci species that were isolated showed that it was sensitive to ceftriaxone 35 (100%), ciprofloxacin in

30 (85%), Amikacin in 25 (71%), Levofloxacin in 18(51%), cefotaxime in 10 (28%).

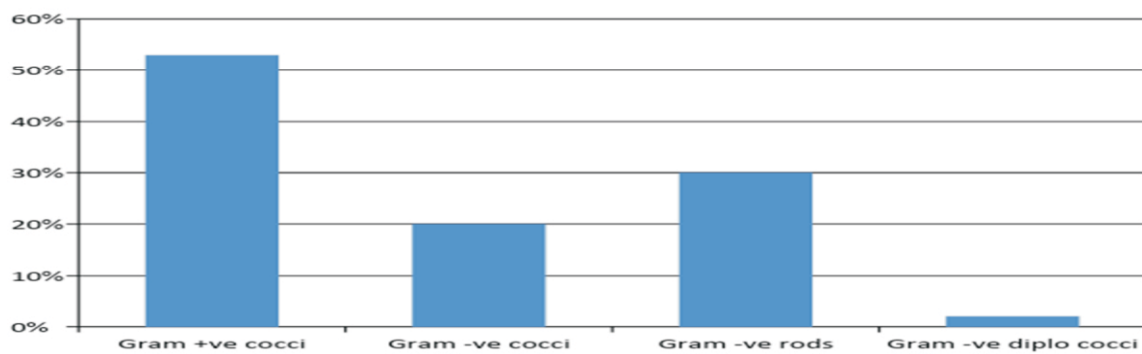


Figure 4. showing frequency of gram negative and gram positive rods and cocci bacteria

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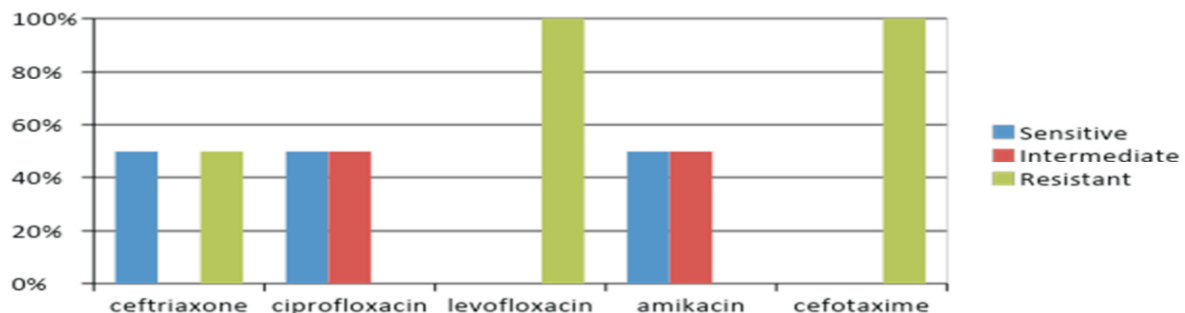


Figure 5. Anti-biotic susceptibility testing for streptococci species

Antibiotic susceptibility testing for the 30Klebsilla microorganisms that were isolated showed that it was sensitive to Levofloxacin 24(80%) , Ciprofloxacin 22 (73%) , Amikacin 18(60%) , Cefotaxime and ceftriaxone 16(53%) .

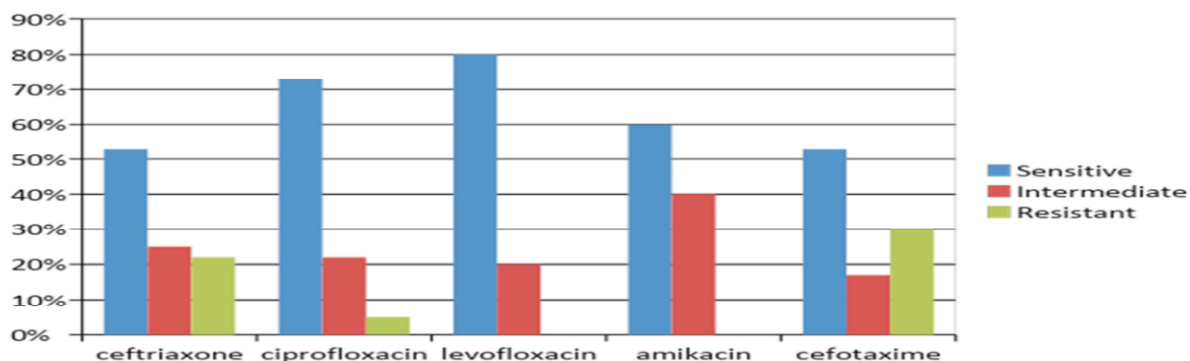


Figure 6. Anti-biotic susceptibility testing for Klebsiella species

As regards susceptibility tests, of the 20 *Pseudomonas aeruginosa* organisms that were tested, 19 (95%) were sensitive to Levofloxacin, 15 (75%) were sensitive to Ciprofloxacin, 10 (50%) were sensitive to Amikacin, 8 (48%) were sensitive to cefotaxime and 5 (25%) were sensitive to ceftriaxone.

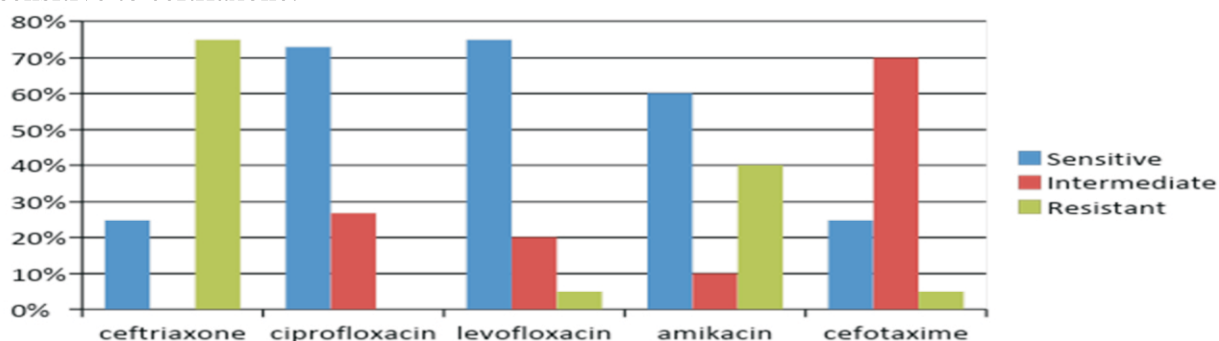


Figure 7. Anti-biotic susceptibility testing for Pseudomonas species

Antibiotic susceptibility testing for the 15 *Pneumococci* species that were isolated showed that it was sensitive to 15 (100%) Levofloxacin, 15 (100%) ceftriaxone, 15 (100%) Amikacin, 15 (100%) Ciprofloxacin, 8 (53%) Cefotaxime.

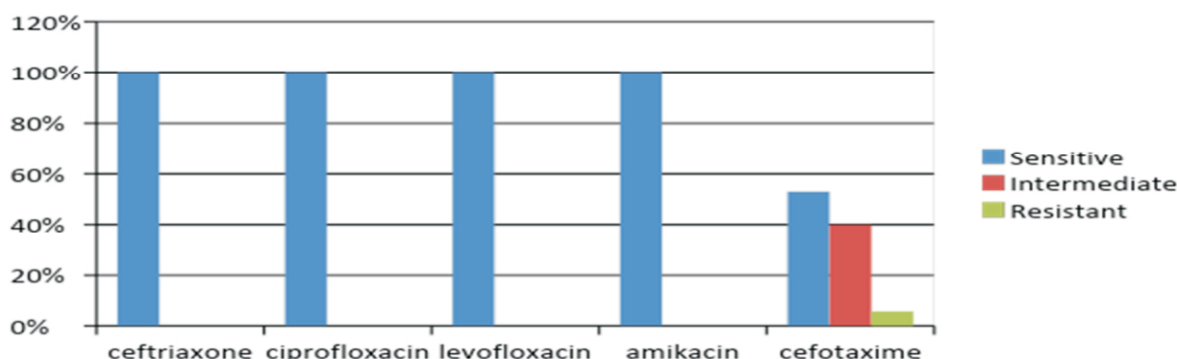


Figure 8. Anti-biotic susceptibility testing for pneumococci species

3 *Staphylococci* species were isolated, antibiotic susceptibility testing for these species showed that all staphylococci species were sensitive to Ceftriaxone (100%), Amikacin (100%), Ciprofloxacin (100%), Cefotaxime 2 (66%), Levofloxacin 1 (33%).

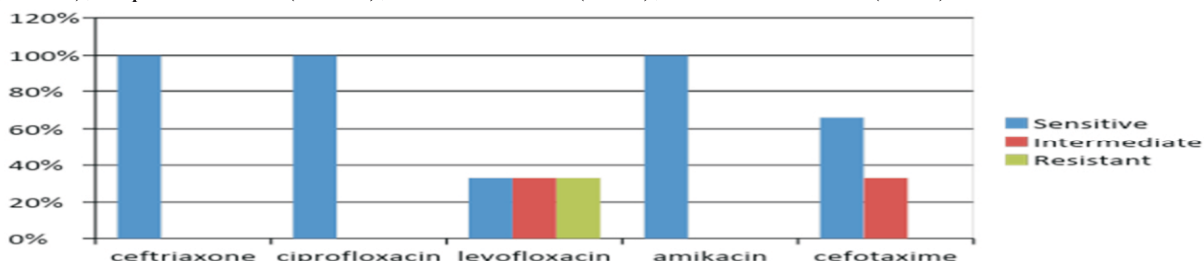


Figure 9. Anti-biotic susceptibility testing for staphylococci species

Antibiotic susceptibility testing for 2 *Meningococci* species revealed that 1 (50%) were sensitive to Ceftriaxone, Amikacin and Ciprofloxacin and resistant to Levofloxacin and Cefotaxime.

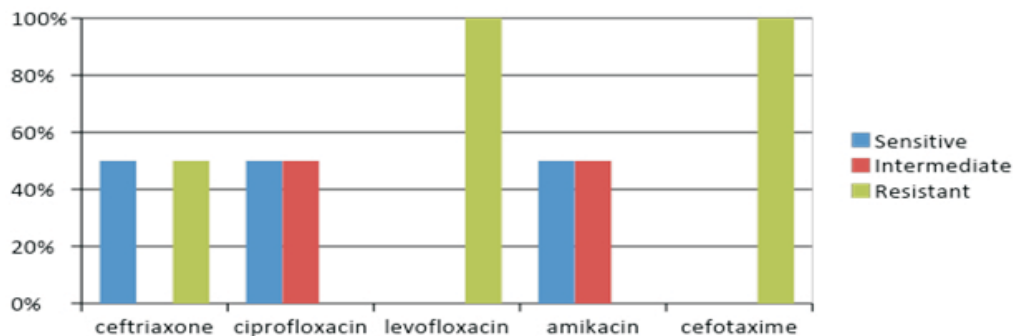


Figure 10. Antibiotic susceptibility for meningococci species

DISCUSSION:

In this cross sectional study, the 110 cases of CSOM were detected and the prevalence of CSOM was 95%. Prevalence of CSOM was more among males than females, mainly the patient were children, below the age of 18 that accounted for 95% among these 25 (22%) were up to the age of 5 years, while adult accounted for 40%. It is clearly evident that CSOM is common in childhood. This is because in this age group of patients, there is short, wide relatively horizontal eustachian tube¹³. This finding is consistent with that of Orgi FT and Dike (2015) they have mentioned that the children having the age lower than 05 years were more affected. In many studies like Monasta et al (2012) the children below 05 years accounted for 22.6% of the cases of CSOM which is also similar to our study findings². The highest distribution of CSOM in our study was between the age of 1 and 20 with the least distribution after the age of 45 years can be due to the increased frequency in seeking health care from traditional healers among patients aged 50 and above as was found by Handi (2018)¹⁴.

There were 54% male and 45% female patients (45%) showing the males were more affected of CSOM than females. This finding is similar to that by Idowu (2014). Where 51% were males and 45% were females. Marium et al also found that CSOM is more in males (56%) than females (43%) (84). There are other studies as well which support the same findings.

The dominant microbiological isolate in this study, was streptococci species, a gram positive cocci (31% followed by Klebsella, pneumonia, a gram negative bacilli (30%) and pseudomonas aeruginosa, a gram negative cocci (20%) Streptococcus species shows a maximum sensitivity to ceftriaxone (100%) was the significant ciprofloxacin

(85%) and Amikacin (71% Haider found that streptococcus (26%) was the significant causative organism in children with CSOM¹⁵. Aliyu (2017) found that streptococci species were least responsible (4.3%) for causing CSOM¹⁵. study found that streptococci species were responsible for 6% for causing CSOM, in both these studies streptococci species were among least causative organism for CSOM. and this finding is not similar to our study. Streptococci species were also isolate in various studies as by Neeff (2016) in this study Neeff found that Streptococci species were microbiota of healthy as well as diseased ears⁴. Streptococci species were also isolate from pus sample of CSOM patients in study streptococci species account for 5.2% and shows maximum sensitivity to Ceftriaxone and Amikacin which is similar to our study¹⁶. Study found that streptococci species were least common isolate that is 0.5% and showed maximum sensitivity to Levofloxacin (100%). Klebsilla was second most isolate in our study it showed maximum sensitivity to Levofloxacin (80%) and ciprofloxacin (73%). Klebsilla species were also second most common isolate and it showed maximum sensitivity to Levofloxacin, this finding is similar to our study. Studies found that klebsilla is among common causative organism of CSOM and showed maximum sensitivity to Ciprofloxacin¹⁷. Study found that klebsilla species are 6% common causative organism for CSOM and showed maximum susceptibility to Levofloxacin. Study conducted on causative organisms of CSOM, his study revealed that klebsilla organism were least responsible for CSOM. In this study pseudomonas aeruginosa was third most common isolate and it showed maximum sensitivity to Levofloxacin. Pseudomonas aeruginosa is most common isolate from the patient of CSOM in many

study conduct in different region of Pakistan. The result of this study are consistent with findings of studies conducted. For *Pseudomonas aeruginosa*, the appropriate drugs were observed to be: amikacin, ceftazidime and ciprofloxacin. High resistance was found against ceftriaxone and aztreonam¹⁸. Overall microbiology of 100 samples was studied. *Pseudomonas aeruginosa* (38%) was the most common bacterial isolate. study conducted on etiological profile and sensitivity spectrum of isolate from CSOM. *Aeruginosa* was the common (46.31%). It was found that ciprofloxacin showed highest sensitivity against pathogens¹⁹. The study shows that the common isolate were: *Pseudomonas aeruginosa* (50%), and *Staphylococcus aureus* (23%). Ciprofloxacin (95%) and amikacin (83%) were found to be most effective drugs. *Staphylococcus* species (2.7%) in our study were least responsible for causing CSOM and showed maximum sensitivity to ceftriaxone, Amikacin and ciprofloxacin²⁰. However in many studies conducted in south Asia including Pakistan *Staphylococci* species are among common causative organism for CSOM and in these studies *Staphylococci* species showed maximum sensitivity to Amikacin and Ciprofloxacin. Meningococci species were seen in 2 (1.8%) culture samples out of 110 and showed maximum sensitivity to Ceftriaxone and Ciprofloxacin. Literature we reviewed for this study none of it showed meningococci isolate as causative organism of CSOM.

Conclusion:

In this study the prevalence of CSOM was found to be 95% , most of the patients were children, below the age of 18 that accounted for 59% among these 25(22%) were upto the age of 5 years, while adult accounted for 40%. The dominant microbiology isolate in this study was streptococci species, a gram positive cocci (31%) followed by *Klebsilla pneumoniae*, a gram negative bacilli (30%) and *Pseudomonas aeruginosa*, a gram negative cocci (20%). *Streptococcus* species shows maximum sensitivity to ceftriaxone (100%), Ciprofloxacin (85%) and Amikacin. *Klebsilla* was second most isolate in our study it showed maximum sensitivity to Levofloxacin (80%) and ciprofloxacin (73%). In this study *Pseudomonas aeruginosa* was third most common isolate and it showed maximum sensitivity to Levofloxacin. It is to be noted that pattern of microbiological isolates described in this study differs from other studies. For proper antimicrobial therapy of CSOM, it is

important to consider geographical location for culture and susceptibility tests.

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