

Microbiological Assessment of Chronic Suppurative Otitis Media.

دراسة الأحياء المجهرية المسببة لالتهاب الأذن الوسطى القيحي المزمن

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الخلاصة:

خلفية البحث: يعد التهاب الأذن الوسطى القيحي المزمن من الأمراض الخمجية الشائعة كما ان دراسة الأحياء المجهرية المسببة للالتهاب وحساسيتها للمضادات الحيوية لها دور أساسي في علاج هذا النوع من الأمراض.

الهدف: هو دراسة الأحياء المجهرية المسببة لالتهاب الأذن الوسطى المزمن القيحي وحساسيتها للمضادات الحيوية بين المرضى المشمولين بهذه الدراسة .
المنهجية: أجريت هذه الدراسة للفترة من كانون الثاني 2012 لغاية كانون الاول 2012 في شعبة الانف والأذن والحنجرة وشعبة الأحياء المجهرية في مستشفى الحكيم العام في النجف . شملت الدراسة مائة مريض مصابين بالتهاب الأذن الوسطى المزمن القيحي تم تشخيصهم سريريا في العيادة الاستشارية ، وتم جمع العينات Ear swabs من المصابين ارسلت لدراستها بكتريولوجيا في شعبة الأحياء المجهرية في مختبر المستشفى وتم تحليل النتائج بإعتماد النسب المئوية .

النتائج: ظهر من خلال هذه الدراسة ان 40% من البكتريا التي تم عزلها كانت من صنف الـ *Pseudomonas aeruginosa* تليها الـ *Staph aureus* بنسبة (19%) . اظهر نموج فحص الحساسية للمضادات الحيوية ان الـ *Pseudomonas aeruginosa* كانت حساسة للمضاد الحيوي (Imipenem) بنسبة 100% والـ *Staph aureus* كانت حساسة بنسبة 100% للمضاد الحيوي (Vancomycin) .

الاستنتاجات: تعد الـ *Pseudomonas aeruginosa* البكتريا المسببة الأكثر شيوعا في حالات الإصابة بالتهاب الأذن الوسطى المزمن القيحي تتبعها الـ *Staph aureus* . اصبحت البكتريا *Pseudomonas aeruginosa* مقاومة وبشكل متزايد للمضادات الحيوية شائعة الاستخدام مثل السفالوسبورينات والأوموكسيل والاميسيلين .

التوصيات: يوصى باجراء فحص الزرع والحساسيه للمضادات الحيوية لكل مريض مصاب بالتهاب الأذن الوسطى المزمن ثم وصف المضاد الحيوي المناسب طبقا لنتائج هذا الفحص .

Abstract :

Background : Chronic Suppurative Otitis Media is a common infectious disease . the microorganisms commonly associated with and their antibiotic sensitivity patterns is important for its treatment .

Objectives : to study the microorganisms associated with chronic suppurative otitis media and their antibiotic sensitivity patterns among our patients .

Material and Methods : this descriptive study was carried out from January 2012 to December 2012 at ENT Department and microbiology department . of AL-Hakeem general hospital in Najaf city .

A total of 100 patients with unilateral and bilateral active chronic suppurative otitis media attending the out patients clinic were included in the study , pus sample were collected from the discharging ears and sent to microbiological department.

Results :- from 100 specimens there were 90 (90%) bacterial isolates and 10 (10%) fungi . *Pseudomonas aeruginosa* 40 (40%) was the dominant isolate followed by *Staphylococcus aureus* 19 (19%) and *Proteus* spp. 15 (15%) . Antibiotic sensitivity pattern of *Pseudomonas aeruginosa* showed that imipenem was active in 100% and Vancomycin was active in 100% of *Staphylococcus aureus* isolate .

Conclusion :- *Pseudomonas aeruginosa* is the most common isolates followed by *Staph . aureus* from the cutluer specimens of chronic suppurative otitis media . *Pseudomonas aeruginosa* is increasingly becoming more resistant to the commonly used antibiotic like cephalosporine Amoxicillin & Ampicillin .

Recommendation: We advise to do culture and sensitivity test for every patient with chronic suppurative otitis media (CSOM) and to describe systemic antibiotics according to the result of this test .

Key words: CSOM : chronic suppurative otitis media , ENT: Ear Nose and throat

INTRODUCTION:

Chronic suppurative otitis media is a common infectious disease in both developing and developed countries¹. It is potentially serious disease and causes a variety of extracranial and intracranial complications like meningitis². chronic suppurative otitis media is defined as an infection of the middle ear that lasts more than 3 months and is accompanied by tympanic membrane perforation¹. The disease is more common in children belonging to lower socioeconomic group. most common micro- organisms found in chronic suppurative otitis media are *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Proteus mirabilis*, *Klebsiella pneumoniae*, *Escherichia coli*, *Aspergillus* species and *Candida* species . But these organism vary in various geographical areas³. Changes in the microbiological flora following the advent of sophisticated synthetic antibiotics, antiphlogistic and antihistamic drugs increase the relevance of reappraisal of the modern date bacterial flora in chronic suppurative otitis media⁴.

The study of the microorganism commonly associated with chronic suppurative otitis media and their in vitro antibiotic sensitivity pattern is very pertinent for the clinician to plan a general outline of treatment for the average patients with achronically discharging ear.

This study was carried out to identify the common microorganism involved and their antibiotic sensitivity patterns in patients with chronic suppurative otitis media .

MATERIAL AND METHODS :

This study was carried out at outpatients department of ENT and microbiology department in AL-Hakeem general hospital from 2nd January 2012 to 30th December 2012 . A total of 100 patients of all age groups and both genders were included . Inclusion criteria consisted of all the patients having unilateral or bilateral chronic discharging ears with tympanic membrane perforation . patient on local or systemic antibiotic treatment within the previous 5-7 days were excluded from this study . pus swabs were taken from the affected ear on sterile swab in ENT outpatient clinic and sent to the microbiology department. samples of discharge were obtained after cleaning the external auditory canal by suction under aseptic condition. swabs were taken from the deeper part of external auditory canal and were inoculated on Blood & MacConkey & Chocolate & Sabouraud Dextrose agar and incubated at 37 C° for 24- 48 hr. The isolates were identified using colony morphology, gram staining, catalase, coagulase, oxidase and biochemical strips. In case of fungal growth, lactophenol cotton blue was used for final identification.

The antimicrobial susceptibility testing was performed on Mueller Hinton agar using the modified Kirby-Bauer disc diffusion method. The antibiotics tested were Amikacin, gentamicin, ciprofloxacin, ceftazidime, ceftriaxone, imipenem, augmentin, Piperacillin, Cefatoxim, Cefixim, Azithromycin, Cefalothine, Trimethoprim, Ampiclox, Vancomycin.

RESULTS :

Table (1) Age and sex distribution

| Age | Male | Female | Total | % |
|--------|------|--------|-------|------|
| 0 - 10 | 6 | 9 | 15 | 15% |
| 11-20 | 7 | 10 | 17 | 17% |
| 21-30 | 12 | 21 | 33 | 33% |
| 31-40 | 6 | 4 | 10 | 10% |
| 41-50 | 7 | 8 | 15 | 15% |
| 51-60 | 5 | 1 | 6 | 6 % |
| 61-70 | 3 | 1 | 4 | 4 % |
| Total | 46 | 54 | 100 | 100% |

Table (1) shows The age of patients included in this study ranged from 1-65 years with peak age group being 21-30 years. (33%) . females 54 (54%) outnumber the males 46 (46%)

Table 2 : Types of organisms isolated from chronic suppurative otitis media patients .

| Type of organism | Total | Percentage % |
|-------------------------|-------|--------------|
| Pseudo. spp | 40 | 40% |
| Staph. aureus | 19 | 19% |
| Proteus spp. | 15 | 15% |
| Kleb. spp | 5 | 5% |
| E. coli | 9 | 9% |
| Candida albicans | 10 | 10% |

| | | |
|-----------------------|---|----|
| Serriatia spp. | 1 | 1% |
| Pantoea spp. | 1 | 1% |

Table 2 shows that out of 100 swabs 90% showed bacterial growth giving an isolation rate of 96 %. *Pseudomonas aeruginosa* (40%) was the commonest organism followed by *Staph. aureus* (19%), *Proteus* spp. Was isolated in (15%) and *E. coli* in (9%), *Klebsiella* spp. was isolated in (5%). *Serriatia* spp. was isolated in (1%), and *Candida* spp. accounted for (10%) of all isolates.

Table 3 : sensitivity pattern of organism isolated from chronic suppurative otitis media patients .

| Type of organism | Total | PRL | AK | CAZ | CRO | CTX | CIP | GM | IPM | AUG | CFM | AZM | KF | TMP | APX | VA |
|-------------------------|-------|-----|----|-----|-----|-----|-----|----|-----|-----|-----|-----|----|-----|-----|----|
| Pseudo. spp | 40 | 19 | 34 | 5 | 13 | 3 | 25 | 23 | 40 | 0 | 0 | 14 | 0 | 20 | 0 | 0 |
| Staph. aureus | 19 | 14 | 16 | 5 | 5 | 4 | 13 | 10 | 18 | 0 | 1 | 9 | 0 | 11 | 0 | 19 |
| Proteus spp. | 15 | 11 | 9 | 2 | 5 | 2 | 14 | 7 | 15 | 0 | 0 | 5 | 0 | 9 | 0 | 0 |
| Kleb. spp | 5 | 3 | 3 | 1 | 3 | 1 | 4 | 4 | 5 | 0 | 1 | 2 | 0 | 3 | 0 | 0 |
| E. coli | 9 | 6 | 7 | 1 | 4 | 1 | 8 | 7 | 9 | 0 | 1 | 3 | 0 | 5 | 0 | 0 |
| Candida albicans | 10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Serriatia spp. | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Pantoea spp. | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

The sensitivity pattern of organisms isolated from chronic suppurative otitis media shown in (Table 3).

DISCUSSION :

Chronic Suppurative Otitis Media is still a challenging problem in developing and under developed countries, owing to its high incidence (5.3%) and high mortality (36%) for economical, social and medical reasons⁵. The mainstay of treatment for uncomplicated CSOM is twofold: meticulous aural toilet and instillation of a topical antimicrobial agent. The therapeutic use of antibiotics is usually started empirically prior to results of microbiological culture & sensitivity test. Selection of any antibiotic depends on its efficacy, resistance of bacteria, safety, risk of toxicity and cost.

In our study, CSOM was found mostly in children and young adults. Same results were obtained in India and Nigeria⁵. In our study females were more than males (54%) in contrast to other studies in which male outnumbered females⁶. other studies showed equal distribution between gender.

In our study majority of isolate were aerobes this correlates well with other studies^{7,8}. Also, *Pseudomonas aeruginosa* was the commonest isolate followed by *Staphylococcus aureus*. This is also supported by literature^{1,9,10}, but few studies showed *Staphylococcus aureus* to be the commonest^{9,11}. In our study fungi were 10 % of the total isolate all of them were *Candida albicans*, other studies showed that fungi were only 3.7% all of them were *Aspergillus* spp.^{11,10}.

Antimicrobial sensitivities of *P. aeruginosa* in our study revealed that 100% of isolates were sensitive to imipenem while 85 % of isolates were sensitive to Amikacin and 62.5% of isolates were sensitive to Ciprofloxacin, this is also supported by other studies^{12,13}.

The sensitivity of *P. aeruginosa* against quinolones has shown a downward trend globally in the recent past. A study carried out in Turkey in 1996 revealed only 6% of *P. aeruginosa* isolates to be resistant to ciprofloxacin¹⁴, where as in South Korea in a study carried out in 2004 ciprofloxacin resistance was noted in 100% of isolates¹⁵. Other studies revealed that more than 90% of isolates were sensitive to ciprofloxacin^{16,20}. The declining sensitivity trend may be due to number of factors

including injudicious use, inappropriate dosage, and easy accessibility and developing enzymatic resistance of organisms against quinolones. Similar differences have been noted in literature regarding activity of aminoglycosides against *P.aeruginosa*^{17,11,18}.

In our study *Staphylococcus aureus* was the second most common isolate, and was 100% sensitive to Vancomycin, 94% sensitive to Imepemem, 84% to Amikacin and 73% sensitive to Pipracillin. Few other studies showed similar result^{19,20,9}.

CONCLUSION :

Pseudomonas aeruginosa is the most common isolates followed by *Staph. aureus* from the cutluer specimens of chronic otitis media. *Pseudomonas aeruginosa* is increasingly becoming more resistant to the commonly used antibiotic like cephalosporine Amoxicillin and Ampicillin.

RECOMMENDATION :

We advise to do culture and sensitivity test for every patient with CSOM and to describe systemic antibiotics according to the result of this test.

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