

Microbiological Assessment of Chronic Suppurative Otitis Media.

دراسة الأحياء المجهرية المسببة لالتهاب الأذن الوسطى القيحي المزمن

Dr. Imad farhan al-zubaidy/ MB .ch .B - FICMS - CABMS otorhinolaryngologist
ENT department -AL-Hakeem general hospital in Najaf .

Imadfarhan1970@yahoo.com

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 الأول 2012 في شعبة الأنف 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 البكتيريا 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 بسنة 100% للمضاد الحيوي (Vancomycin) .

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

التوصيات: يوصى باجراء فحص الزرع والحساسية 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 countries ¹. It is potentially serious disease and causes a variety of extracranial and intracranial complications like meningitis ². 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 perforation ¹. 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 pneumonia*, *Escherichia coli*, *Aspergillus species* and *Candida species* . But these organism vary in various geographical areas ³. 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 media ⁴.

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 a 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 %
<i>Pseudo. spp</i>	40	40%
<i>Staph. aureus</i>	19	19%
<i>Proteus spp.</i>	15	15%
<i>Kleb. spp</i>	5	5%
<i>E. coli</i>	9	9%
<i>Candida albicas</i>	10	10%
<i>Serriatia spp.</i>	1	1%
<i>Pantoea spp.</i>	1	1%

Table 2 shows that out of 100 swabs 90% showed bacterial growth giving an isolation rate of 96 %. *Pseudomonas aerogenosa* (40%) was the commonest organism followed by *Staph. aureus* (19%), *Proteus spp.* Was isolated in (15%) and *E. cloi* in (9%), *Klebseillia 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 .

The sensitivity pattern of organisms isolated from chronic suppurative otitis

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

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 Imipenem, 84% to Amikacin and 73% sensitive to Piperacillin. Few other studies showed similar result^{19,20,9}.

CONCLUSION :

Pseudomonas aeruginosa is the most common isolates followed by *Staph. aureus* from the cutaneous 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.

REFERENCES

1. Browning GC merchant SN , Kelly G ,SwanIR , Canter R , Mckerrow WS chronic otitis
2. Aslam MA, Ahmad Z, Azim R. Microbiology and drug sensitivity patterns of chronic otitis media. J Coll Physicians Surg Pak 2004;14:459-61.
3. Iqbal SM, Udaipurwala IH, Hasan A, Shafiq M, Mughal S. Chronic suppurative otitis media: disease pattern and drug sensitivity. J Surg Pak 2006;11:17-9.
4. Ahmad S, Iqbal MA, Hassan Z, Khurshid T, Ali L, Pervez Q. Spectrum and bacterial isolates in chronic suppurative otitis media in Khuzdar. Pak J Otolaryngol 2006;22:34-6

5. Sharma S, Rehana HS, Goyal A, Jha AK, Upadhyaya S, Mishra SC. Bacteriological profile in chronic suppurative otitis media in Eastern Nepal. *Trop Doct* 2004;34:102-4.
6. Vikram BK ,Khaja N,udayashankar SG,venkatesha BK,manjunath Dclino-epidemiological study of complicated and un completed chronic sappurative otitis media.j lartgol otol 2007;121 242.
7. Mirza IA, Ali L, Arshad M. Microbiology of chronic suppurative otitis media- experience at Bahawalpur. *Pak Armed Forces Med J* 2008;4:372-6.
8. Jakimovska F, Cakar M,Lazarevski A, Clemmesen J, Dimitrovski E.Chronic suppurative otitis media-microbiological findings. *Balkan JOtol Neuro-otol* 2002;2:104-6.
9. Taj Y, Essa F, Kazi SU. Pathological analysis of 596 cases of chronic otitis media in Karachi. *J Coll Physicians Surg Pak* 2000;10:33-5.
10. Hwang JH, CHU CK, Liu TC. Changes in bacteriology of discharging ears. *J Laryngol Otol* 2002; 116:686-9.
11. Loy AHC, Tan AL, Lu PKS. Microbiology of chronic suppurative otitis media in Singapore. *Singapore Med J* 2002;43:296-99.
12. Biswas Ac,Jorder AH, siddique BH prevalence of csom among rural school going children . *my mensign medical Journal* 2005 Tul:14(2):152-55.
13. Brook I. Microbiology and management of chronic suppurative otitis media in children. *J Trop Pediatr* 2003;49:196-9.
14. Jang CH, Park SY. Emergence of ciprofloxacin resistant pseudomonas in chronic suppurative otitis media. *Cli Otolaryngol* 2004;29:321-3.
15. Masud-ul-Haq, Tariq TM, Jalil S. Chronic suppurative otitis media: a study in children of female hospital workers. *Pak Pediatr J* 2002; 26:155-65.
16. Attaullah MS. Microbiology of chronic suppurative otitis media with cholesteatoma. *Saudi Med J* 2000;21:924-7.
17. Ahmad B, Hydri AS, Afridi AAK, Ejaz A, Farooq S, Zaidi SK. Microbiology of ear discharge in Quetta. *J Coll Phycians Surg Pak* 2005;15: 583-4.
18. Poorey VK, Lyre A. Study of bacterial flora in CSOM and its clinical significance. *Ind J Otolaryngol and Head & Neck Surg* 2002;54: 91-8.
19. Kuczkowski J. Samet A, Brzoznowski W. Bacteriologic evaluation of otitis externa and chronic otitis media. *Otolaryngol Pol* 2000;54:551-6.
20. De A, Mathur M, Bradoo RA. Bacteriology of chronic suppurative otitis media without cholesteatoma. *Indian Practitioner* 2002;55:426-8.