A study of Antibacterial Resistance Associated with Otitis Media Patients in Al-Diwaniyah Teaching Hospital

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الخلاصة

إجراء هذه الدراسة على مجموعة من مرضى التهاب الإذن الوسطى التقيحي في العيادة الاستشارية للأنف والأذن والحنجرة في مستشفى الديوانية التعليمي من كانون الثاني إلى آب 2010 .

مجموع مرضى التهاب الإذن الوسطى التقيحي (55) شخص من كلا الجنسين وتراوحت أعمارهم بين (1-60) سنة. أخذت المسحات من الأذن قبل المعالجة أجريت عليها عمليات العزل والتشخيص ثم فحص الحساسية للمضادات الحيوية لكل عزلة.نتائج الزرع البكتيري(52) موجبة الزرع . البكتريا السالبة لصبغة كرام كانت أكثر تكرارا (56%) من البكتريوجبا لصبغة كرام(44%) . كانت بكتريا(*Pseudomonas aeruginosa*)الأكثر شيوعا(30%) ثم بكتريا *Proteus vulgaris*) (16%) وبكتريا أخرى (12%) بينما البكتريا الموجبة لصبغة كرام كانت (*Staph. aureus*) (38%) و (*Staph. epidermidis*) (4%) .

بينت النتائج هناك زيادة معنوية في نسبة المقاومة البكتيرية للمضادات الحيوية وربما تسبب تكرار الإصابة بالتهاب الإذن الوسطى.

Abstract

This study is conducted on a group of patients with suppurative Otitis media from E.N.T. clinic in Al- Diwaniya Teaching Hospital during January to August 2010.

A total number of (55) individuals of both sexes , as patients with suppurative otitis media, consisting of (25) males and (30)females. The age of patients range from(1-60)years.Samples (ear swab) are taken before treatment .The collected sample is processed for bacterial isolation , identification and antibiotic sensitivity test are assessed for each isolate.

positive results of bacterial culture are (52) (94.54%) of ear swab samples from supurative Otitis media .Gram negative bacteria are more prevalent (29:50)(56%) compared with Gram positive which constitutes (19:50)(44%).

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As Gram negative *Pseudomonas aeruginosa* is the most common bacterial species isolated from patients with otitis media(30%), *Proteus vulgaris* (16%) ,other gram negative bacteria species (12%) . while Gram positive are *Staphylococcus aureus* (38%) and *Staphylococcus epidermidis* (4%).

Antibiotics resistance phenomena was seen for many antibiotics, that may be cause of recurrent of Otitis media .

Introduction

Otitis media was an acute infection/inflammation of the middle ear mucosa which also involves the mastoid air cells most often. AOM is predominantly a childhood infection without sex preponderance ; and 75% of the few adults that have this preponderance [1]; and 75% of the few adults that have this condition are young adults below 44 years of age.[2] In AOM, bacteria are found in approximately 50%–90% of cases[3]. The most common bacteria found in middle ear infections . Viruses can be found in 20%–49% of middle ear fluids and confections with bacteria in up to 66% of cases[3,4] . Risk factors of AOM are parental smoking , use of pacifiers [5], attending large group day-care centers, bottle feeding[6], male sex, large families, sibling history of recurrent otitis media (ROM)[7,8]and viral respiratory infections[9].Interference in Eustachian tube (ET) function can predispose infants to OM. The Eustachian tubes in infants are shorter and more horizontal than those of adults and they are also narrower and less stiff [10] . There is also evidence that the muscular opening function increases with age and that children with ontological diseases have poorer ET function than healthy children[11]

The continuing success of antimicrobial therapy depends on keeping ahead of the ability of the microorganisms to develop resistance to antimicrobics. At times, resistance seems to occur at a rate equal to that of the development of new antimicrobics[12,13].

Since penicillin and sulphonamides were introduced for treatment of AOM, the nature of management of OM has changed[14] . Complications of suppurative OM, most frequently acute mastoiditis, and the incidence of operations because of chronic OM

have declined dramatically, which is partly due to improved welfare and hygiene in Western countries[15], The aetiology of AOM has also altered; about thirty years ago beta-haemolytic streptococci were the most important pathogen [15]. Despite these facts, an increased proportion of antibiotic-resistant bacteria and obscurity in placebo-controlled studies concerning the efficacy of treatment have aroused debate about treatment policies in AOM [16,17]. The goal in the management of AOM is to relieve the symptoms, accelerate the resolution of middle ear fluids in order to elimate hearing loss caused by it and to prevent sequelae. Because bacteria play a major role in the pathogenesis of OM, antibiotics have been indicated in the treatment. Several studies have been conducted in order to clarify whether antimicrobials are beneficial in the management of AOM[18].

Aim of the study

study of antibacterial resistance and associated it with recurrent otities Media.

Materials and methods

Using disposable ear swab , specimen from the ear (exudates, discharges were collected from each patients with otitis media , then cultured on blood agar and MacConky agar . A single colony was taken from each primary positive culture on blood agar , and on Mac Conckey agar and it has been identified depending on its morphology (colony shape, Size ,colour, border, and texture),and then examined by the microscope after being stained with Gram's stain . After staining ,the biochemical test have been done on each isolate to complete the final identification[19] .The antimicrobial susceptibility testing was done by the agar discs diffusion method as that described by (*Commisso et al*., 2000)[14] The antibiotic discs were listed in table are used in the antibiotic sensitivity test.

Table of Antibiotic Discs Used with Their Remarks

Antibiotic	Symbol	Concentration microgram /ml	Manufacturer/ State
Gentamicin	CN	10	Bioanalyse/ Turkey
Ampicillin	Am	10	
Azithromycin	AZM	15	=
Ciprofloxacin	CIP	5	=
Cephalothin	C	30	=
Sulfamethazole	Su	300	=
Doxycycline	DO	30	=
Ceftriaxon	cefr	30	=
Augmentin	Ag	30	=
Rifampin	R	10	=

Results

Patient's ear swab have subjected to aerobic cultivation on different types of culture media, the results reveal that 52 samples are given positive results , whereas 3 samples have shown no negatives results for culture . the negative results may be due to the consumption of antibiotics by the patients or the presence of other causative agents for Otitis media as anaerobic bacteria or viral agents . The result show that gram negative bacteria constitutes about (56%)(29:50) from the total isolates and compared with Gram positive bacteria which constitutes only (44%)(19:50) as in figure. The high percentage of Gram negative bacteria may be due to it high percentage of normal flora in ear canal ,Eustachian tube ,and nasapharanx , anatomic cause as shortness canal of Eustachian tube[20,21].

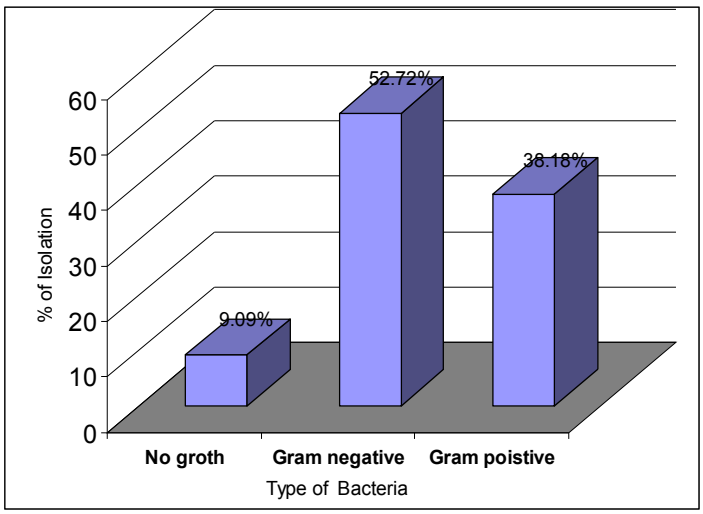

Figure (The percentage of bacteria with Gram stain)

In this study *Pseudomonas aeruginosa* is the most common bacterial species isolated from patient with Otitis media (30%)this result is in consistent with that of Joki-erkkila ,(2003)[22],Who finds more common results (Ryan *et al*., 2004)[23] is reported (*Pseudomonas aeruginosa* is the most common causative pathogen). This may be due to the antibiotics resistance of pseudomonas ,this bacteria which is opportunistic , in immunocompromise patients . *Proteus vulgaris* (16%) is in the second order of Gram negative bacteria isolates from the patient under study .

Other Gram negative bacteria isolated from Otitis media with low percentage are *Enterobacter spp*. (6 %) , *Acintobacter baumanni* (4%) , *E. coli* (2%) respectively.

the Gram positive bacteria isolate in this study are *Staph. aureus (*38%*)* , *Staph* . *epidermidis* (4%) this result correspond with (Ryan et al., 2004)[23] this association may be due to the fact that staphalococci is a part of normal flora of ear canal and Eustachian tube .

The results of this study reveal that there is a remarkable increase in bacterial resistance as explain in table of sensitive test .

Table of sensitive test

Antibiotic	*Pseud. spp.* S %	R %	*Proteus spp.* S %	R %	*Staph. aureus* S %	R %	*Staph. epidermidis* S %	R %
cefriazone	15	85	70	30	25	75	0	100
Augmentin.	10	90	25	75	65	35	0	100
Ciprofloxacin.	95	5	75	25	35	65	100	0
Rifampin.	0	100	10	90	35	65	0	100
Sulfamethazole.	10	90	0	100	30	70	100	0
Cephalothin.	10	90	15	85	60	40	35	70
Gentamycin.	40	60	40	60	40	60	-	-
Ampicilin	0	100	70	30	0	100	100	0
Doxycycline	25	75	15	85	40	60	-	-
Azithromycin	10	90	15	85	15	85	100	0
chi-square tests	429.714 DF=9 Significant		323.308 Df=9 Significant		147.03 Df=9 Significant		715.525 Df=7 Significant	

S=sensitive R=resistant

Discussion

Patient's ear swab have subjected to aerobic cultivation on different types of culture media ,our results revealed that 52 samples were given positive results , whereas 3 samples have shown no negatives for culture . the negative results may be due to the consumption of antibiotics by the patients or the presence of other causative agents for Otitis media as anaerobic bacteria or virual agents. The result shown that gram negative bacteria constitutes about (56%) (29:50) from the total isolates & compared with Gram positive bacteria which constitutes only (44%)(19:50). The high percentage of Gram negative bacteria may be due to it high percentage of normal floura in ear canal ,Eustachian tube ,and nasapharanx , anatomic cause as shortness canal of Eustachian tube [21].

For each species of bacterial isolated from Otitis media patients There significant increase of resistance as in above table .that may be one causes of recurrent Otitis media in some cases . therefore sensitive antibiotics test must be done for each patient. Use narrow-spectrum rather than broad-spectrum antimicrobics

when the specific etiology of an infection is known, if possible. Epidemiologically monitor resistant organisms or resistance determinants in an institution and apply enhanced control measures.

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