Isolation of Some Bacteria from Chronic Otitis Media

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الخلاصة

أن مرض ألتهاب الأذن الوسطى المزمن من الأمراض الشائعه بين الناس وذلك بسبب عوامل متعدده منها أحيائيه ، بيئيه وأجتماعيه . جمعت نماذج من الأذن المريضه للمراجعين للعيادات المتخصصه بالأذن والأنف والحنجره عدد الحالات 75 حاله منها 51 حاله موجبة لألتهاب الأذن الوسطى (68%) و 24 حاله سالبه (32%) . عدد الحالات الموجبة من الذكور 28 (54.9%) والحالات الموجبة من الأناث 23 (45.1%) .

بينت النتائج الرئيسيه نسب عالية من الأصابه في الأعمار بين 20 – 29 سنه و 30- 39 سنه (31.4 % و 25.5 %) على التوالي ، فضلاً عن نسب عالية سجلت في الذكور (54.9 %) أكثر من النساء .

تم عزل ستة أنواع من البكتريا من المرضى ، أثنين منها كانت موجبة لصبغة كرام وهي (*Staphlococcus aureus , Streptococci pyogens*) بينما البكتريا السالبة لصبغة كرام كان عددها أربعة وهي (*Pseudomonas aeruginosa , Proteus vulgaris , E. coli and Enterobacter cloacae*) .

أعلى نسبة بين البكتريا الموجبة لصبغة كرام كانت *S. aureus* (*90.5* %) بينما أعلى نسبة بين البكتريا السالبة لصبغة كرام كانت *P. aeruginosa* (56.6%) .

تم أجراء أختبار الحساسية للمضادات الحيوية وذلك لمعرفة أفضل هذه المضادات لتستعمل كعلاج لألتهاب الأذن الوسطى . أغلب المضادات التي كانت ذو تأثير جيد على البكتريا هي (Cefotaxin , Co-trimaxozole , Gentamycin, Tetracyclin).

Abstract

Chronic Otitis media is a very common disease in people of Diwania due to several factors , microbiological , envirnmental and social .

Swab samples and data were collected from private surgeries of specialized doctors (ENT) . 75 samples were collected , 51 cases were positive (68%) and 24 cases were negative (32%). Number and percent of infected males 28 (54.9%) , while number and percent of infected females 23 (45.1%) .

The main results showed high percents of infection were in ages between 20-29 years old and 30-39 years old(31.4 % and 25.5%) respectively .

Six types of bacteria were isolated from the patients , two of them were gram positive (*Staphylococcus aureus and Streptococcus pyogens)* while gram negative were four (*Pseudomonas aeruginosa , Proteus vulgaris , E. coli and Enterobacter cloacae*) .

The highest percent of gram positive was *S. aureus 90.5%* , and the highest percent of gram negative was *P.aeruginosa 56.6%*) .Sensitivity test was done to know the best antibiotic can be used as treatment for otitis media . The most effective antibiotics for most causative agents were cefotaxin , co-trimaxozole , gentamycin , tetracycline.

Key words: Bacterial Isolates , otitis media**.**

Introduction

Otitis media is a common disease in people all over the world [(1)] , published a review on otitis media and its causes bacterial , viral , fungal ,allergic , but [(2)] , recorded the most common bacterial pathogens as *Staphylococcus sp*. *Pseudomonas sp* . *Proteus sp*. and *E. coli* .

Otitis media is an inflammation of middle ear which is related anatomically

and pathologically with upper respiratory tract , therefore the nasopharynx is a natural reservoir for several bacterial specieses including avirulent bacteria and middle ear pathogens of healthy persons , 20- 40 % accompanied infection together [3] .

Some researchers worked on otitis media of children and recorded several informations of this disease such as duration , occurrence , severity and symptoms . [4] worked on risk factors affecting the occurrence of acute otitis media among 2-3 years old urban children . In Boston , [5] showed the percent of the incidence of otitis media in Boston USA was 43% in children while [6] , reported the incidence of otitis media in Finland was 0.5 million cases occur annully . [7] , emphasized that the incidence of otitis media was very common in children under 6 years old . [8] , published data on relation of age with occurrence of otitis media .

Other researchers worked on the affects and sensitivity of antibiotics on the bacterial causative agents . [9] , worked on antibiotics as treatment to acute otitis media and reported important results about the sensitivity of several types of bacteria , while [10], published a paper on the effects of several types of antibiotics which were used in prevention of acute and chronic suppurative otitis media . (11) , worked on risk factors effect due to use a pacifier . Other researchers worked on prevalence and risk factors during first two years of life (13) .

In present study concentrated on bacterial causes of otitis media , isolation , epidemiological distribution in people of Diwania / Iraq and antibiotic sensitivity of causative agents.

Materials and Methods

Sterile cotton swabs were used for collection samples from ear exudate (75) patients suffered Otitis media attended to private surgery for diagnosis and treatment during ten months from the 1st of January till the end of October . Fifty one cases were positive for bacterial infection , while the rest 24 cases without growth .

Culturing : All collected samples were cultured directly in following media :

Blood Agar , MacConkey Agar , Chocolate Agar .

Swabs were moved near the edge of petridish , then to spread the streaks with sterilized wire loop to obtain very well spread growth of colonies . Overnight incubation (24) hours , the colonies were examined and diagnosed , then classified depend on shape , color , margin , diameter and zone of hemolysis (12) .

Diagnosis of Isolated Bacteria :

Direct smear ; Direct smear were done directly from the samples before and after culturing with using gram stain to identify gram positive and gram negative bacteria.

Biochemical tests :

IMVIC test , Oxidase test , TSI , Catalase test , Coagulase test / slide test [12] .

Antibiotic Sensitivity disc :Anti-bacterial susceptibility was determined by using Kirby-Bauer disc . The following antibiotics were used for testing the sensitivity of bacteria and its quantities per disc (mg/ disc) .

Agumentin ; 30 , Amikacin ; 30 , Amoxicillin ; 10 , Ampicillin 10 , Cephalexin ; 30 , Cefotaxin ; 30 , Chloramphenicol 30 , Ciprofloxacin 5 Clindamycin ; 30 , Co-trimoxazole ; 2 , Doxycycline Erythromycin ; 15 , Gentamycin ; 10 , Rifampin ; 15 Norflaxin ; 10 ,Streptomycin ; 10 , Tetracycline ; 30 ,Tobramycin ; 10

Results

Relation of sex of patients with types of bacteria : All cases (75) were diagnosed but only 51 cases were positive for bacterial isolation (68%) while the negative cases were 24 (32%) . Positive cases most of them were males 28 (54.9%) while females were 23(45.1%) table (1) .

Relation of Positive cases of Otitis media with age of Patients were distributed in , table (2) .

So the ages in between 20- 29 years old recorded the highest percent of infection (31.4%) , while the ages in between 1-9 years old recorded the lowest percent of infection 9.8% , Figure (2) .

Types of Isolates :

Gram positive bacteria were isolated from 21 cases 41.1 % while the gram negative were isolated from 30 cases 58.7% , table (3) .

The highest percent in gram positive bacteria was *Staphlococcus aureus* (90.5%) , while the highest percent in gram negative bacteria was *Pseudomonas aeruginosa* (56.6 %) .

As well as table (4) show the frequency and percents of bacteria as and mixed infection were recorded . *S . aureus* was the higest percent among the isolates (27.4%) , while *the Streptococci* , *E. coli , Enteric bacteria* were the lowest (3.8)% . Single infection was higher than mixed (78.4% , 21.6%) respectively .

Susceptibility to antibacterial agents :

There were six types of isolated bacteria recorded *(Staphylococcus aureus* 37.1% , *Pseudomonas aeruginosa* 33.2% , *Proteus vulgaris* 17.6% , *E. coli* 3.8% , *Streptococci pyogens* 3.8% , *Enteric bacteria cloacae* 3.8%).

Antibacterial susceptibility test was useful as a guid for treatment . The sensitive antibiotics were taken in consideration for using in treatment of otitis media .

Antibacterial susceptibility was determined by using Kirby – Bauer disc .

The results showed that *S.aureus* was sensitive to most antibiotic (45%) and the Cefotaxin was the highest (12.3%) ,the resistance of this bacteria was 55% while the resistance of *p. aeruginosa* was 69.8% ,Co-trimoxazole and Cefotaxin were the highest (12.5% , 11.4%) respectively while the sensitivity was 30.2% , Gentamycin was the highest percent (12.5%) among all tested antibiotics .

Sensitivity of *Proteus* against antibiotic (37.7%) Gentamycin was the highest (8.8%) and its resistance to Ampicillin , Cefotaxin and Tetracyclin was 62.3% . *E.coli* was highly resistant to the most antibiotic (83.4%) and its sensitivity was to Amikacin , Rifampin and Gentamycin (table 5) .

Table (1) Number and percents of infected bacteria in relation to the sex of patients .

Sex	*Staph*		*Pseudo*		*Proteus*		*E.coli*			*Strep*		*Enter*
	No	%	No	%	No	%	No	%	No	%	No	%
M	8	15.6	11	21.5	5	9.8	1	1.9	1	1.9	2	3.8
F	11	21.5	6	11.7	4	7.8	1	1.9	1	1.9	-	-
Total	19	37.1	17	33.2	9	17.6	2	3.8	2	3.8	2	3.8

Table :(2) relation of positive cases with age .

Age	1-9	10-19	20-29	30-39	40-49	Total
No .	5	9	16	13	8	51
%	9.8	17.6	31.4	25.5	15.7	100

Table (3) : Number and percents of gram positive bacteria and gram negative .

Type of bacteria	No.	%
G +ve		
Staphlococcus aureus	19	90.5
Streptococci pyogens	2	9.5
Total	21	41.1
G –ve		
Pseudomonas aeruginosa	17	56.6
Proteus vulgaris	9	30
E.coli	2	6.6
Enterobacteria cloacae	2	6.6
Total	30	58.7

Table (4) : The numbers and percents of single and mixed infection.

Bacteria	Single		mixed		Total	
	No.	%	No.	%	No.	%
S.aureus	14	27.4	5	9.7	19.	37.1
P.aeruginosa	15	29.3	2	3.8	17	33.2
P.vulgaris	7	13.7	2	3.8	9	17.6
E.coli	1	1.9	1	1.9	2	3.8
S.pyogens	1	1.9	1	1.9	2	3.8
E.cloacae	2	3.8	-	-	2	3.8
Total	40	78.4	11	21.6	51	100

Table -5- demonstrate the number and the percents of sensitivity and resistances of bacteria .

Bacteria	Sensitive		Resistance		Total No.
S.aureus	40	45.1	49	55	
P.aeruginosa	29	30.2	67	69.8	96
Proteus	17	37.7	28	62.3	45
E.coli	2	16.6	10	83.4	12
Streptococci	2	33.3	4	66.7	6
Enterobacter	4	66.7	2	33.3	6

Table (6) include types of antibiotic prevent growth of bacteria and that not worked (bacteria resist the antibiotic) . There are variations in sensitivity and resistance of isolated bacteria .

Types of bacteria	I sensitivity	I resistance
S.aureus	Chlorm. Rifa. Clind. Augm. Amik.Doxy	Co-tri. Cefo. Gent. Ampi.Tobr. Eryth.
P.aeruginosa	Gent. Chlorm. Cipro. Cefo.Tobr.	Ampic. Tetra. Rifa. Co-tri. Augm. Doxy.
P.vulgaris	Cipro.Tobr.Amik. Cefo. Cefi. Chlorm.	Augm. Rifa. Gent. Tetr. Amp. Eryth.
E.coli	Gent. Amik.	Amp. Tetra. Chlorm. Eryth. Augm. Rifa.
S.pyogens	Clind. Augm. Rifa. Tetr.	Gent. Tobr. Cefo. Co-tri. Cefi
E.cloacae	Cipro. Cefo . Gent. Co-tri.	Tetr. Eryth. Cefo. Cefi .

Discussion

There were wide variations in incidence of otitis media that occur in different ages in present research high percents were in between 20- 29 , 30- 39 years old (31.4% and 25.5 % respectively) due to these ages exposed to several predisposing factors for occurrence otitis media , these factors include smoking, different soures of diet and environmental factors . In

comparison with results of Paradise *et al (* 1997) who found the highest percent was in age between 6- 12 months old , these results among the children were studied , as well as the differences depend on the risk factors that patients exposed to .

Most research work for otitis media not presented any significant differences between male and female due to most these researches were done on children . In present study there was significant difference recorded between males and females (54.9% , 45.1%) respectively , (14) found nearly the same of our result (53%) percent of infection in males , but (15) reported high percent of infection in females 60% . Hence social relations and social factors play an imporitant causes in is distribution of infection between sex.Differences in types of isolated bacteria depend on different types of environmental factores , geographical regions and health of people , while the differences in the results of sensitivity , this is depend on differences between virulence , strain of bactria and resistance of people . There is no significant differences between the percent of infection with gram negative and gram positive , but there was wide variation between single and mixed infections (78.4% ,21.6%) respectively , this is depend on codition of the patients (pesional factors) such as health and immunity .

Mos bacteria were sensitive to Ciprofloxacin ,Amikacin , Rifadin, Augmentin, Gentamycin , while it resist Ampicilin , Erythromycin , Tetracyclin . It seems , most bacteria have adapted with common antibiotics and not sensitive to it .

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