Culture-sensitivity tests for otitis media diagnosed causative bacteria in Kirkuk province

Muna Jalal Ali[1*], Rehab Kurdy[2] and Safaa Sultan[3]

1 Department of Medical Laboratory Technique, Al-Haweeja Technical Institute, Northern Technical University, Mosul 41002, Iraq; Email: munajalal2@gmail.com
2 Department of Biology ,Al-Qalam University
3 Department of Medical Laboratory Technique, Mosul Technical Institute, Northern Technical University, Mosul 41002, Iraq

Abstract, Otitis media is an inflammatory disease of the middle ear. It is an infection of rapid onset that usually presents with ear pain. It results from a sore throat, cold and respiratory or breathing problems through transferring to the middle ear. The objective of this study to investigate the bacteria causing otitis media and testing their antibiotics sensitivity . fifty swabs samples of otitis media patients were collected from Kirkuk hospital for period from 1/ 11/2018 to30/ 3/2019,the patient's age ranged (10-50)years old. The bacterial isolates were calculated and the sensitivity for several antibiotics was tested. We found that *S.pyogen* by 34.8,*klebsiella* 23.2, *S.aureus* 17.4, *pseudomonas* 5.8,*Streptococcus pneumonia* 5.8.*S.epidremidis* 11.6. Amikacin was the highest sensitivity by 38.09, Ciprofloxacin 23.8, the similarity of Ampicillin and Rifampicin by 14.28%, and erythromycin recorded about 9.52 . the higher infection of otitis media reported in male patients about (80%) and the percent in the female about (20%).S.pyogen appear the higher percentage. Male higher than females in infection percentage. All bacteria were sensitive to amikacin. the first age group was the highest infection of otitis media.

Keywords:-Otitis media, bacteria, antibiotics, Kirkuk .

1 Introduction

Otitis media is a group of infectious and complex infections that affects the 'middle ear with various subtypes associated with complications and treatment of otitis media. The main reason for health is visiting all over the world and its complications are important. Hearing loss can be avoided, especially in developing countries (1). Otitis media is very common in children and there is a high level of miscarriage. This is an unavoidable disease in childhood, and is part of the natural maturity of the immune system. Acute otitis media is inflammation of the middle ear cavity and is one of the most common bacterial infections in childhood (3). Chronic otitis media is considered a common disease in childhood, and if it is insufficient or under-treatment it can cause serious complications that can seriously affect the child or the quality of life. Indeed, societies with more than 5% of children affected by perforation of the eardrum of the eardrum, this is the main social problem, the main social problem (4). It is defined as inflammation of the external auditory canal and can also affect the auricle of the valikatal of talecatalal paralatal lactal. One of them “develops” within a few hours of fever and hearing loss (6).

Diagnose acute otitis media 3 criteria need to be met sing and symptoms of middle ear inflammation 2) the presence of middle ear effusion and 3) acute onset (often abrupt)of sing and symptoms of middle ear inflammation and effusion (7). Complications of otitis media These are meningitis, brain abscess, thrombus, sinuses, common abscess, otitis media, hydrocephalus, and encephalitis. Medium (OMA) acute otitis media is a viral and/or bacterial infection of the middle ear and is the “most common childhood infection for which antibiotics are described in the United States (9). Diagnosis From OMA: What The operational characteristics (sensitivity, specificity, and likelihood ratios) of clinical symptoms and endoscopy results (such as swollen eardrum), individual and combined, for the diagnosis of complex AOM and differentiation are from otitis media with effusion (10) SP - liquid isolated from the ear medium bacterial environment reset. Otitis media is inflammation of the middle ear and eardrum, which "often occurs as a result of acute upper respiratory infection. Secondary bacterial infection (12) acute otitis media (AOM) is the most common bacterial infection in children, and, accordingly, the most common cause of antibiotic prescription in this age group (13). Increase injury in middle ear infection about 13%.

IMDC-SDSP 2020, June 28-30, Cyberspace

DOI 10.4108/eai.28-6-2020.2298224

The aim of the study to Isolate, and identify the bacterial isolates of middle ear infection from different patients of the male and female and determined the sensitivity of different antibiotics against bacterial isolates.

2 Methodology

2.1 Sample collection

All otitis media isolates were collected by Kirkuk hospitals from fifty selected individuals from November 2018till march 2019 (period of study) *in vitro*. Sterile swabs were used for selected individuals of both sexes between the ages of 10 and 50. The collected samples were transferred to the laboratory of the Technical University of the North. They were raised on sterile food agar plates and incubated at 37 ° C for 24 hours, then purified, raised on the diagonal of the agar and partially determined against the gram reaction and kept at 4 ° C in refrigerants until use.

2.2 Inoculum Preparation

After initial proliferation, all 24-hour test microbes were grown in nutrient broth medium at 37 ° C, and test vaccines were prepared by diluting. The suspension microbial density was adjusted using a GENESYS 10S UV-Vis spectrophotometer of 0.5 McFarland. (10^7 CFU/ml)(14).

2.3 Biochemical tests

Indol test: Inoculate the liquid peptone water with isolates, incubate at 37 ° C for 24 hours, add 0.5 ml of Kovacs reagent to the incubated tube and shake lightly. The appearance of a red ring on the surface of the medium indicates a positive result(14).

Methyl red test: Inoculate the MR- VP medium with bacteria and incubate at 37 ° C for 24 hours, and add 5 drops of the methyl reagent to the medium. The result is positive when a red appears on the surface of the medium(14).

Voges - Proskauer test: The tubes containing the MR-VP medium were inoculated with bacteria and incubated for 24h at 37 ° C, 6 drops of alpha-naphthol reagent and two drops of potassium hydroxide reagent were added. The results were read after 15 minutes. A change in color to red indicates the positive test(15).

Urease test: Habitats in the urea agar were pollinated with pure isolates from the germs by stabbing and planning method and incubated for 24 hours at 37 ° C. The mid-shift from yellow to pink indicates positive test(15).

Citrate utilization test: The test was performed with a diagonal inoculation of Simon Street Cimmon citrate medium, Bacteria and incubate the medium at 37 ° C for 24 hours. The positive test result is a change in the color of the medium from green to blue(15).

KIA kligler Iron agar oblique growth test: Isolations on the KIA diagonal slant were implanted in a stab-and-plan manner. The tubes were incubated at 37 ° C for 24 hours. It used to detect the ability of bacteria to ferment glucose and lactose sugar by changing the color of the medium due to the red phenol reagent being yellow or remaining red. As the color change of the medium from red to yellow at the bottom of the medium indicates fermentation of glucose sugar, while the change in the color of the medium completely to yellow indicates the fermentation of glucose and lactose sugar, while the change in the color of the medium indicates that no fermentation of glucose and lactose sugar occurs when bubbles appear. Gaseous indication of the production of carbon dioxide as a result of fermentation of glucose and sedimentary black

2.4 Antimicrobial susceptibility test

Selected antibiotic against oral isolates: All antibiotics used in this study were purchased from Mast disctm, Mast Diagnostics, Mast group, Mersey side, using disc diffusion method of Muller-Hinton agar from Hardy Diagnosis. According to the manufacturer's recommendations, the media were sterilized at 121 ° C for 15 minutes and then cooled to 45-50 ° C and then poured into the dishes allowed to be placed on a flat surface at a depth of about 4 mm. five antibiotics disc 6mm were placed in media. After that, they were placed in the coolant for 15 minutes and incubated at 37 ° C for 24 hours, and measured the diameter of each inhibition region. and recorded in mm(15). All plates were prepared in triplicate for each test organism and the mean diameter were collected and represented as antimicrobial susceptibility percentage against all otitis media isolates.

3 Results and Discussion

The current study included (50) samples of the otitis media infection and its symptoms and causes and treatment,the swabs were collected from several people of different age and both of gender. The growing bacterial colonies diagnosed on blood medium, macconky agar, and mantol salt medium were diagnosed through microscopic, phenotypic and biochemical examinations which included tests for the intestinal family (catalase, oxidase, Simon street, methyl red, Voges - Proskauer, indole, urease, KIA kligler)

This study reveal the bacterial isolates, showed that *S.pyogen* by 34.8, *klebsiella* about 23.2, *S.aureus* 17.4 , the similarly of bacteria pseudomonas and *Streptococcus pneumonia* recorded by 5.8, for the *S.epidemidis* about 11.6% as shown in Table 1

The sources of ear infections are the same as those bacteria. It is necessary that he suffers from irritation of the esophageal duodenum, but it is possible It is noteworthy that the Paran pollution appeared in the sewers since the use of the Incorrect cleaning of the ear helps transport the nurses to any other place then it is permissible to swimming, so long as it collapses and is soaked, it is not considered .The role of an infestation is not to infect bacteria, as these water sources are accidentally exposed For the pollution of human and animal wastes. .

Table.1 The percentage of bacteria isolates from otitis media

Types of Bacteria	Number of Bacteria	Percentage
Streptococcus pyogen	6	34.8
Klebsiella	4	23.2
S.aureus	3	17.4
Pseudomonas	1	5.8
S.epidemidis	2	11.6
Strepto pneumonia	1	5.8

3.1 Antibiotic sensitivity:

The sensitivity test was carried out using five antibiotics used to treat otitis media, for 50 isolated bacterial isolates from the medial ear. The bacterial isolates showed that Amikacin was the highest sensitivity by 38.09, Ciprofloxacin 23.8, the similarity of the two antibiotics were Rifampicin and Ampicillin about 14.28 and erythromycin 9.52%.

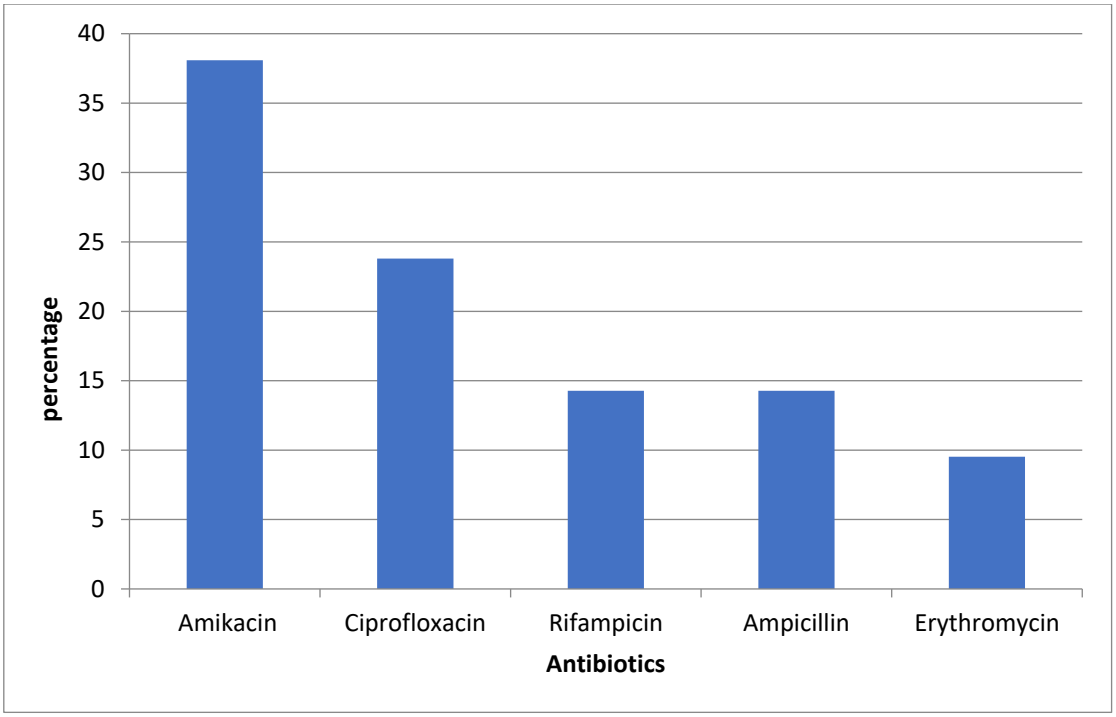

Fig.1. Antibiotic sensitivity against bacterial isolates from otitis media

It is clear from the results of the our study that most bacteria have a relatively less sensetivity to beta-lactam antagonists represented by penicillin. The high bacterial resistance to beta-lactam antagonists is due to several mechanisms, the most important of which is the ability to produce beta-lactamase enzymes which breaks the beta-lactam ring, permeability barrier changes or weakening affinity between the antagonist and target sites P.B.Ps(10)

As for the group of anti-amino-glucoside (Amikacin), the results of the sensitivity examination showed that the higher sensitivity demonstrated by the bacteria against Amikacine was high compared to other types of this group.As for the Erythromycin antagonist, isolates showed high resistance(11)

We note from the above that the increase in resistance to bacterial isolates may be due to the frequent random use of antigens as well as the possibility of bacteria acquiring the genetic factors that transmit the multiple resistance traits by conjugation.

3.2 Relationship between the gender and otitis media infection

Figure (2) shows that the percentage of samples with significant bacterial growth is higher in males 80 % than in females 20%. This is consistent with what was mentioned in some studies that the ratios of bacterial production are more in females than in males

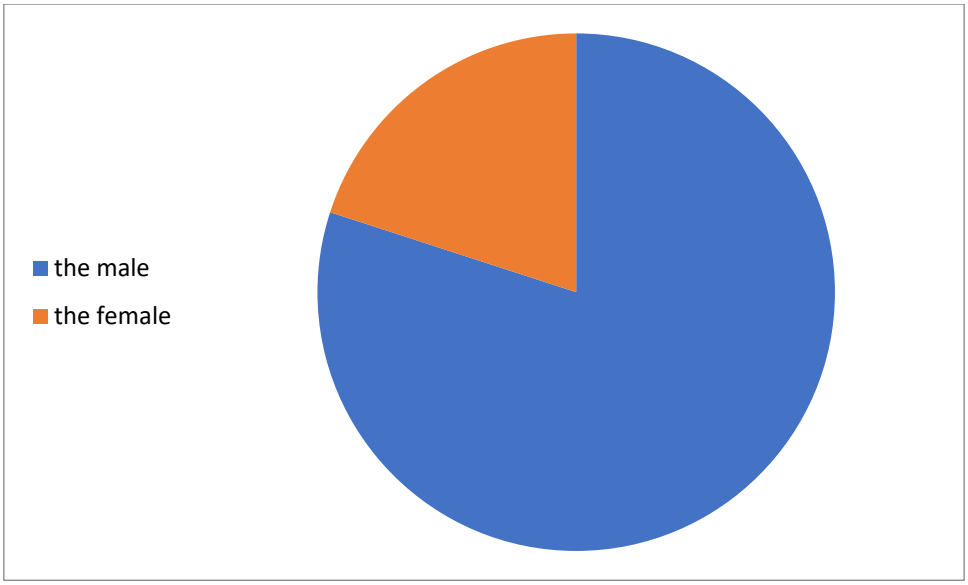

Fig. 2. The relationship between gender and otitis media infection

3.3 Relationship between the age and otitis media infection

The most important factors that play a large role in otitis media infections, and divide the groups of patients according to age groups into three-stage groups. (1-17)year, (18-35), and (36-48) years, as shown in figure 3 prevalence Infection in different age groups. The first age group was the higher infection with otitis media by 45% than other groups

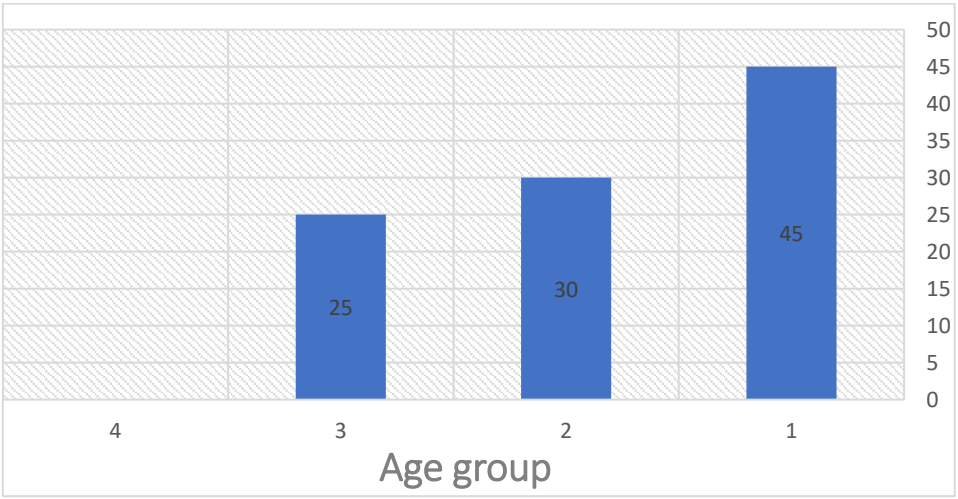

Fig. 3 The relationship between age group and infection :1.(1-17)year, 2.(18-35), 3.(36-48)

Perhaps the reason for the appearance of the highest rate of infection is in the first age group any exhaust that completes the two immune system's robustness leads to a loss and doubles the construction. As for the lowest percentage of infection, it was in the third age group 25% and this is the return of the reviewers, so this is not the reward for the clinics. Counseling due to their advanced age, the results of this study are consistent with both(12,13) .

4 Conclusion

Streptococcus pyogen was a higher infection with otitis media. The first age group a higher infection than other groups and males showed higher than females in infection percentage. Amikacin higher effective against the bacteria isolates from otitis media.

Reference

[1] Monasta L, Ronfani L, Marchetti F, et al. Burden of disease caused by otitis media: systematic review and global estimates. PLoS One.pp 226-236. (2012).

[2] Rovers MM, Schilder AGM, Zielhuis GA, Rosenfeld RM. Otitis media. Lancet pp.465–473. (2004).

[3] Lieberthal AS, Carroll AE, Chonmaitree T et al. Diagnosis and management of acute otitis media. Pediatrics .pp. 64-74.(2013)

[4] Morris PS, Leach AJ. Acute and chronic otitis media. Pediatr Clin North Am. pp:1383-1399.(2009).

[5] Rosenfeld RM, Schwartz SR, Cannon CR et al. Clinical practice guideline: acute otitis externa. Otolaryngol Head Neck Surg pp.150-159 (2014)

[6] Lieberthal AS, Carroll AE, Chonmaitree T et al. Diagnosis and management of acute otitis media. Pediatrics pp.131-141.(2013)

[7] Lieberthal AS, Carroll AE, Chonmaitree T et al. Diagnosis and management of acute otitis media. Pediatrics pp: 964-974.(2013)

[8] Bales CB, Sobol S, Wetmore R, Elden LM. Lateral sinus thrombosis as a complication of otitis media: 10-year experience at the Children's Hospital of Philadelphia. Pediatrics.pp.123-134 (2009)

[9] Laine MK, Tahtinen PA, Ruuskanen O, Huovinen P, Ruohola A. Symptoms or symptombased scores cannot predict acute otitis media at otitis-prone age. Pediatrics. Pp.1154-1161.(2010)

[10] Little P, Gould C, Williamson I, Moore M, Warner G, Dunleavey J. Pragmatic randomised controlled trial of two prescribing strategies for childhood acute otitis media. BMJ. Pp.336-342. (2001)

[11] Jacobs MR. Antibiotic-resistant Streptococcus pneumoniae in acute otitis media: overview and update. Pediatr Infect Dis J. pp.947-952.(1998)

[12] Morris PS, Leach AJ. Acute and chronic otitis media. Pediatr Clin North Am pp.1383–1399.(2009)

[13] -Teele DW, Klein JO, Rosner B. Epidemiology of otitis media during the first seven years of life in children in greater Boston: a prospective, cohort study. J Infect .Dis. pp:83-94.(1989).

[14]**.** Ali, Muna Jalal, & Obaid, RashaFadhelObaidandRana Fadhil. Antibacterial Activity for Acne Treatment through Medicinal Plants Extracts: Novel Alternative Therapies for Acne. *J Pure Appl Microbiol, pp.* 1245-1250.(2019)

[15]**.** Ali, Muna Jalal, Makky, Essam A, & Yusoff, Mashitah M. IMPACT OF ANTIMICROBIAL AGENTS ON BACTERIAL ISOLATES FROM DENTAL DECAY.pp.123-133.(2016)