# Bacterial spectrum and their antibiotic sensitivity pattern in children with otitis media in Abeokuta, Ogun State, Nigeria

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**ABSTRACT:** Otitis media is a common infection of middle ear resulting from bacterial infection. Samples were collected from different children with otitis media at two different hospitals in Abeokuta, Ogun State, Nigeria, over a five months period (January 2013 to May, 2013). During this study period, 100 children with atticoantral type otitis media consisting of 42 females and 58 males with an age range of ≤2-14 years were assessed. Patients with persistent otorrhea for more than 3 months with atticoantral type of chronic otitis media were also selected. The exudates were collected under sterile conditions and inoculated onto culture media; bacterial growth and antibiotic sensitivity pattern were studied. Out of the 100 samples, 48(48.0%) were positive for bacterial cultures. Peak prevalence of 50.0% occurred among the 0-2 years age group. Five species of bacteria were isolated from the middle ear aspirate, *Pseudomonas aeruginosa* being the most predominant isolate constituting about 35.4% (17 discharging ears) of the total isolates followed by *Staphylococcus aureus* (29.2% of isolates), *Proteus species* (14.6% of isolates), *Escherichia coli* (10.4% of isolates) and *Klebsiella pneumoniae* (10.4% of isolates). Gram positive bacteria accounted 64.6% of total isolates and gram negative bacteria constituted 35.4% isolates. Generally, high resistance rates were recorded against many of the antibiotics tested. Pseudomonas isolates showed susceptibility to ceftazidime (75.0%) and a high sensitivity (79.2% of isolates) to gentamycin and 62.5% isolates were sensitive to ofloxacin. Gentamycin (83.3%), ceftazidime (81.2%) and ciprofloxacin (79.2%) were the most effective antibiotic to *S. aureus* isolates. About 87.5% of *Proteus species* isolated from inoculates showed sensitivity to ceftazidime and ciprofloxacin. It also showed 83.0% sensitivity to gentamycin and 66.7% to ofloxacin and cefuroxime. The most effective antibiotics to *E. coli* were gentamycin and ceftazidime 44(91.7%). It also showed that 91.7% *Klebsiella pnuemoniae* were susceptible to ceftazidime, 87.5% were sensitive to gentamycin, streptomycin and ceftriaxone, and 81.3% were sensitive to ofloxacin. In conclusion, the findings of this study may contribute to an effective medical management of otitis media, since the most common organisms in this clinical set up being *P. aeruginosa*, S. aureus and *Proteus species* which showed a percentage susceptibility of 62.5% to 91.7% to most of the antibiotic commonly used in Abeokuta, Nigeria. It was observed that gentamycin and ceftazidime antibiotics had good sensitivity pattern across all the tested bacterial isolates obtained from ear infections of children in Ogun State, Nigeria. Continuous and periodic evaluation of bacterial spectrum and antibiotic sensitivity of otitis media is necessary to decrease the potential risks of complications by early institution of appropriate systemic and topical antibiotic alongside mastoid exploration.

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## 1. INTRODUTION

Otitis media, an inflammation of the middle ear, is a common illness in childhood, and also one of the most frequent reasons for outpatient antimicrobial therapy (Okesola and Fasina, 2012). Otitis media is the infection associated with the malfunctioning of the middle ear due to pathogenic micro-organisms that are resident tentatively in the middle ear (Isah and Abubakar, 2003). It also can be define as the inflammation of the middle ear. This is most commonly caused by the building up of fluid behind the ear drum, as a result of a blockage to the Eustachian tube. Otitis media is more common in children, as their Eustachian tube is shorter and more

horizontal than adults and is made up of more flaccid cartilage, which can impair its opening (Bluestone and KLien, 2001). In otitis media, the middle ear is usually affected due to colonization by pathogenic organisms. The damage causes the deficiency in hearing (Damoiseaux, 2005).

Chronic suppurative otitis media (CSOM) is one of the commonest illnesses in ENT practice which requires medical attention all the more in children of poor socio-economic status having in past inadequate treatment and negligent medical care (Saini et al., 2005). Chronic suppurative otitis media (CSOM) is the most common cause of childhood hearing impairment in the developing countries and atticoantral type is associated with increased incidence of intracranial and extracranial complications (Madana et al., 2011). The disease usually begins in childhood as a spontaneous tympanic perforation due to an acute infection of the middle ear, known as acute otitis media which presents with a rapid onset of signs and symptoms, such as pain, fever, irritability; a red bulging ear drum and middle ear effusion (Jahn, 1991). The bacteria may be aerobic (e.g. *Pseudomonas aeruginosa*, *Escherichia coli*, *Staphylococcus aureus, Streptococcus pyogenes Proteus mirabilis, Klebsiella species*) or anaerobic (e.g. Bacteroides, Peptostreptococcus, Proprionibacterium) (Saunders et al., 2009).

Otitis media can be symptomatic and equally asymptomatic, when none of the physical signs accompanying the infection is noticed apart from the sever pains ensuing from the inner ear, it is then said to be asymptomatic but if there are evidences of mucus irritation and rashes on the external meatus, discharges in addition to the pains, such otitis media is said to be symptomatic (Damoiseaux, 2005).

Otitis media varies in complication depending on the level of severity and duration of the infection in relationship to the associated microorganism (Oni *et al*., 2002). In studies that employed adequate method for recovery of anaerobic bacteria polymicrobial aerobic and anaerobic flora was isolated from over half of the children with CSOM (Brook, 2008). The types of pathogens involved in OM have also been found to be dependent on geographical location (Jacobs et al., 1998; Okesola and Fasina, 2012). The predominant aerobic isolates were *Staphylococcus aureus* and *Pseudomonas aeruginosa* and the most frequently isolated anaerobic organisms were *Peptostreptococcus*, *Fusobacterium* spp. and pigmented *Prevotella* and *Porphyromonas* spp (Brook, 2008). The most frequently isolated organism in chronic suppurative otitis media from different parts of the world is *Pseudomonas aeruginosa* (Adoga et al., 2011). The pattern from this bacteriological study from our region is different (Adoga et al., 2011).

Several studies illustrated the efficacy of anti-infective agents effective against anaerobic bacteria in the treatment of CSOM (Brook, 2008). The medical therapy of CSOM should be directed at the eradication of the pathogenic aerobic and anaerobic organisms (Brook, 2008). In view of the polymicrobial etiology of CSOM, prompt appropriate antimicrobial therapy can effectively reverse the disease process thereby preventing longterm sequelae (Saini et al., 2005). Continuous surveillance of susceptibility pattern is suggestive for effective therapy of chronic suppurative otitis media (Sattar et al., 2012). The aim of this study was to determine the bacterial spectrum and their antibiotic sensitivity pattern in children with otitis media in Abeokuta, Ogun State, Nigeria, thereby reducing the potential risks of complications.

## 2. MATERIALS AND METHODS

### 2.1. Collection of samples

Purulent materials were collected from one hundred (100) children suffering from otitis media at two different hospitals in the Ogun State over a period of five months (January - May, 2013). Samples were collected with sterile swab sticks which were properly labelled indicating the source, date, time of collection, age of patients and personal history. The samples were analysed in Medical Microbiology Laboratory unit within 4 - 6 h after collection.

### 2.2. Bacterial Isolation and Identification

Blood Agar, Deoxycholate Agar and MacConkey Agar were used for bacterial isolation. The swab sticks used for the collection of the samples were streaked directly on the labelled agar plates. These plates were incubated at $37^0$C for 24-48 hours. The streak technique in the Nutrient agar was employed for bacterial colony purification. The discrete colonies from these subcultured plates and series of biochemical tests were done for proper characterization and identification. The bacterial isolates were also identified by comparing their characteristics with those of known taxa, as described by Jolt et al. (1994) and Cheesbrough (2004).

### 2.3. Antibiotics susceptibility testing

Bacterial pathogens of acute otitis media and CSOM were isolated and identified from theseaural swabs using standard bacteriological methods. They were subsequently subjected to antimicrobial susceptibility testing according to the recommendation of the Clinical and Laboratory Standards Institute (CLSI) for disc diffusion tests (CLSI, 2007). The susceptibility pattern of the bacterial pathogens were determined towards the following antimicrobial agents, Gentamycin,

Erythromycin, Levoxin, Ampicillin, Augmentin, Ceftriaxone, Cotrimoxazole, Ofloxacin, Tetracycline, Streptomycin, Ciprofloxacin, Cloxacillin, Amoxicillin, Cefuroxime, and Ceftazidime. The diameters of zones of inhibition around the bacterial colonies were measured with a calibrated ruler and interpreted as susceptible or resistant using an interpretive chart (CLSI, 2007).

## 3. RESULT ANALYSIS

Out of the 100 ear swabs samples, 48(48.0%) were positive for bacterial cultures. Table 1 shows the prevalence of otitis media with bacterial infection in relation to the age groups of patients. It showed that age group 0-2 years had the highest prevalence of bacterial infections 24(50.0%) while age group 12-14 years had the least prevalence 2(4.2%).

**Table 1: Number of Otitis media showing bacterial growth among the age group**

| Age group (years) | Number of patients | Number with bacterial growth (%) |
|---|---|---|
| ≤ 2 | 48 | 24(50.0) |
| 3-5 | 24 | 14(29.2) |
| 6-8 | 12 | 4(8.3) |
| 9-11 | 10 | 4(8.3) |
| 12-14 | 6 | 2(4.2) |
| **Total** | **100** | **48(48.0)** |

Table 2 shows the prevalence of otitis media with bacterial infection in relation to gender. Of the samples from 42 females enrolled in this study, 20(41.6%) had bacterial infections while 28(58.4%) of the 58 samples from males had bacterial infections.

**Table 2: Prevalence of Otitis media with bacterial infection in relation to gender**

| Gender | Number examined | Number with positive growth (%) |
|---|---|---|
| Females | 42 | 20 (41.6) |
| Males | 58 | 28 (58.4) |
| **Total** | **100** | **48(48.0)** |

Table 3 shows the frequency of occurrence of bacterial isolates obtained. It showed that *Pseudomonas aeruginosa* 17(35.4%) was the most predominant. This was followed by *Staphylococcus aureus* 14(29.2%), *Proteus sp* 7(14.6%), *Escherichia coli* 5(10.4%) and *Klebsiella pneumonia* 5(10.4%).

**Table 3: Frequency of Occurrence of Bacterial Isolates obtained from otitis media**

| Isolates | No. (%) | Males (%) | Females (%) |
|---|---|---|---|
| *Pseudomonas aeruginosa* | 17(35.4) | 9(52.9) | 8(47.1) |
| *Staphylococcus aureus* | 14(29.2) | 10(71.4) | 4(28.6) |
| *Proteus sp* | 7(14.6) | 3(42.8) | 4(57.2) |
| *Escherichia coli* | 5(10.4) | 2(40.0) | 3(60.0) |
| *Klebsiella pneumonia* | 5(10.4) | 4(80.0) | 1(20.0) |
| **Total** | **48 (100.0)** | **28(58.3)** | **20(41.7)** |

**Table 4: Antibiotic susceptibility pattern of bacterial isolates obtained from different clinical samples of otitis media**

| Antibiotics | Pattern | GEN | STR | OFL | CIP | AMP | CXC | CAZ | CXM | CEF | ERY | COT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *P. aeruginosa* | Sensitive (%) | 38(79.2) | 30(62.5) | 30(62.5) | 28(58.3) | 2(4.2) | 1(2.1) | 36(75.0) | 28(58.3) | 28(58.3) | 19(39.6) | 9(18.8) |
| | Resistant (%) | 10(20.8) | 18(37.5) | 18(37.5) | 20(41.7) | 46(95.8) | 47(97.9) | 12(25.0) | 20(41.7) | 20(41.7) | 29(60.4) | 39(81.2) |
| *S. aureus* | Sensitive (%) | 40(83.3) | 34(70.8) | 36(75.0) | 38(79.2) | 20(41.7) | 2(4.2) | 39(81.2) | 28(58.3) | 28(58.3) | 22(45.8) | 18(37.5) |
| | Resistant (%) | 8(16.7) | 14(29.2) | 12(25.0) | 10(20.8) | 28(58.3) | 46(95.8) | 9(18.8) | 20(41.7) | 20(41.7) | 26(54.2) | 30(62.5) |
| *Proteus sp* | Sensitive (%) | 40(83.3) | 24(50.0) | 32(66.7) | 42(87.5) | 6(12.5) | 4(8.4) | 42(87.5) | 32(66.7) | 30(62.5) | 20(41.7) | 18(37.5) |
| | Resistant (%) | 8(16.7) | 24(50.0) | 16(33.3) | 6(12.5) | 42(87.5) | 44(91.7) | 6(12.5) | 16(33.3) | 18(37.5) | 28(58.3) | 30(62.5) |
| *E. coli* | Sensitive (%) | 44(91.7) | 32(66.7) | 42(87.5) | 30(62.5) | 4(8.3) | 19(39.6) | 44(91.7) | 38(79.2) | 32(66.7) | 30(62.5) | 20(41.7) |
| | Resistant (%) | 4(8.3) | 16(33.3) | 6(12.5) | 18(37.5) | 44(91.7) | 29(60.4) | 4(8.3) | 10(20.8) | 16(33.3) | 18(37.5) | 28(58.3) |
| *K. pneumonia* | Sensitive (%) | 42(87.5) | 42(87.5) | 39(81.3) | 30(62.5) | 20(41.7) | 18(37.5) | 44(91.7) | 32(66.7) | 42(87.5) | 30(62.5) | 9(18.8) |
| | Resistant (%) | 4(12.5) | 4(12.5) | 9(18.8) | 18(37.5) | 28(58.3) | 30(62.5) | 4(8.3) | 16(33.3) | 6(12.5) | 18(37.5) | 39(81.2) |

Gen = Gentamycin, Ery = Erythromycin, Lev = Levoxin, Amp = Ampicillin, Aug = Augmentin, Cef = Ceftriaxone, Cot = Cotrimoxazole, Ofl = Ofloxacin, Tet = Tetracycline, Str = Streptomycin, Cip = Ciprofloxacin, Cxc = Cloxacillin, Amx = Amoxicillin, Cxm = Cefuroxime, Caz = Ceftazidime, S – Sensitive

The antibiotic susceptibility pattern of the isolates is shown in Table 4. The most effective antibiotic to *P. aeruginosa* obtained from the otitis media were gentamycin 38(79.2%) and ceftazidime 36(75.0%) while high resistance was recorded for antibiotics such as ampicillin and cloxacillin.

Gentamycin, ceftazidime and ciprofloxacin were the most effective antibiotic to *S. aureus* while *S. aureus* was resistant to cloxacillin (95.8%), cotrimoxazole (62.5%) and ampicillin (58.3%). *Proteus sp* was sensitive to ceftazidime 44(87.5%) and ciprofloxacin 44(87.5%), followed by gentamycin 40(83.3%). Also, high resistance was recorded to cloxacillin (91.6%) and ampicillin (87.5%). The most effective antibiotics to *E. coli* are gentamycin and ceftazidime 44(91.7%) while resistance was recorded against ampicillin (91.6%) and cloxacillin (60.4%). *Klebsiella pnuemoniae* was sensitive to ceftazidime 44(91.7%), followed by gentamycin 44(87.5%), high resistance was recorded to cotrimoxazole (81.2%), cloxacillin (62.5%) and ampicillin (58.3%).

## 4. DISCUSSION

Otitis media develops from a bacterial infection. However, the bacteria that caused the initial episode of acute otitis media with perforation are usually not those isolated from the chronic discharge when there is a chronic infection in the middle ear and mastoid infection usually polymicrobial and secondary in nature, derived from the external auditory canal or commensal flora of nasopharynx (Bluestone and Klien, 2001).

The significant risk factors in OM include socioeconomic status, cultural, seasonal, and age factors, as well as family history of middle ear disease (Rotowa et al., 1989; Okesola and Fasina, 2012). Although OM is primarily a disease of infants and young children, it can also affect adults (Gate, 1996; Okesola and Fasina, 2012). Furthermore, the incidence is higher in males than in females (Paradise et al., 1997; Okesola and Fasina, 2012).

In this study, the peak incidence was found in the age group 0-2 years [24(50.0%)] while age group 12-14 years had the least incidence [2(4.2%)]. The peak incidence was also found in males (58.4%) than females (41.6%). This agrees with the findings of most previous studies. In a study by Okesola and Fasina (2012), the peak incidence was found in the age group 0 – 10 years (47%) and a decline with advancement in age. This has been attributed to the shorter, wider, and horizontal Eustachian tube in children than in adults, offering greater opportunities for pathogens to ascend from nasopharynx to the sterile middle ear cavity (Bluestone and Klein, 2001; Okesola and Fasina, 2012).

The most common bacterial pathogens of otitis media in this study were *Pseudomonas aeruginosa* (35.4%), *Staphylococcus aureus* (29.2%), *Proteus sp* (14.6%), *Escherichia coli* (10.4%) and *Klebsiella pneumonia* (10.4%). However, other authors had claimed that the most common bacterial pathogens of otitis media are *Streptococcus pneumoniae*, *Hemophilus influenza* and *Moraxella catarrhalis* (Kilpi et al., 2001; Okesola and Fasina, 2012). Other pathogens responsible for otitis media are *Staphylococcus aureus*, *Escherichia coli, Klebsiella* species, *Pseudomonas aeruginosa* and *Proteus* species (Klein, 1994; Okesola and Fasina, 2012). In the Okesola and Fasina (2012) study, *P. aeruginosa* (43.7%) was found to be the most prevalent bacterial pathogen of otitis media and CSOM in this Ibadan, followed by *Klebsiella* species (31.0%), *Proteus mirabilis* (14.1%), *Escherichia coli* (7.0%), *H. influenzae* (2.8%) and *S. aureus* (1.4%).

Among the isolates, *Pseudomonas aeruginosa* 17(35.4%) was the most predominant bacterial isolate. This is in agreement with Verhoeff *et al*. (2006) who reported that *P. aeruginosa* was the most prevalent bacteriological agent in chronic otitis media, followed by *S. aureus*. It is also in agreement with earlier studies carried out by Adedeji et al. (2007); Ogisi and Osamar (1982) and Selina (2002) who also reported *P. aeruginosa* as the most common bacteria isolated from mild to severe form of external otitis and chronic suppurative otitis media. It is also in agreement with a study conducted by Kawo et al in the Northern part of Nigeria (Kawo et al., 2010) and Okesola and Fasina (2012) in Southwestern Nigeria. In contrast with previous studies, our finding is disagrees with that of Aslam *et al*. (2006) and Saunders *et al*. (2009) that stated that *S. epidermidis* species was the most prevalent bacteriological agent in chronic otitis media. The commonest bacterial aetiologic agents of CSOM in a study by Nwabuisi and Ologe (2002) in Ilorin, Nigeria were *Pseudomonas aeruginosa* (26.0%) and *Proteus spp* (21.8%). the most common bacteria in a study by Gül et al. (2006) was *Pseudomonas aeruginosa* (23%), followed by *Staphylococcus aureus* (18%), and *Proteus* spp. (17%). However, in a study conducted in Iran, the most frequently isolated pathogen of otitis media was *S. aureus* followed by *P. aeruginosa* and *Proteus* species (Ettehad et al., 2006; Okesola and Fasina, 2012). In the United States of America, Israel and Eastern Europe, the commonest bacterial pathogens of OM were *Streptococcus pneumoniae*, *H. influenzae* and *Moraxella catarrhalis* (Jacobs et al., 1998; Okesola and Fasina, 2012).

*S. aureus* was the second most common isolates in this study. This disagrees with Okesola and Fasina (2012) who reported *Staphylococcus aureus* (1.4%) to be the least common bacteria isolated organism in acute otitis media and chronic suppurative otitis media. According to Saunders *et al*. (2009), pus production is a common manifestation of infections due to *S. aureus* in tissues and sites with lowered host resistance such as damaged skin and mucous

membrane, where it may produce skin lesion such as boil or surgical site infections. This possibly explained the high incidence of *S. aureus* from bacterial isolates obtained in this study. Saini et al. (2005) reported *Staphylococcus aureus* to be the commonest aerobic isolate in paediatric CSOM, while in adult CSOM, *Pseudomonas aeruginosa* was the commonest one.

In this study, *Klebsiella* species were isolated from patients suffering otitis media. According to Bluestone et al. (1974) patients infected by Enterobacteriaceae such as *Klebsiella* species, most of them are children and infants group, because the Eustachian tube in children is shorter and wider than adult. This permits a reflex from nasopharynx to the middle ear with the consequence of bacterial contamination. *P. aeruginosa* is well known as a hardy and difficult organism that constitutes problems to researchers (Brooks *et al*., 2001).

According to Okesola and Fasina (2012), many antimicrobial agents have been used for the treatment of otitis meida infection and these include penicillin, cephalosporins, vancomycin and azithromycin. However, bacterial resistance to these antimicrobials has become an increasing problem in the treatment of otitis media (Alsaimary et al., 2010; Okesola and Fasina, 2012). *Klebsiella* sp., *Escherichia coli* and *Streptococcus sp.* are the leading pathogenic organisms in chronic suppurative otitis media in our region and their sensitivity rates are highest to the quinolone antibiotics, which are relatively cheap, readily available as ototopic agents and lack ototoxic effects (Adoga et al., 2011). In-vitro drug sensitivity pattern of all isolates in a study by Adoga et al. (2011) shows that they were more sensitive to ofloxacin, ciprofloxacin and perfloxacin.

In this study, gentamycin and ceftazidime were the most active antibiotics to *P. aeruginosa.* Generally, high resistance rates were recorded against many of the antibiotics tested. This is in agreement with our previous study on *P. aeruginosa* (Akingbade *et al.*, 2012). Pseudomonas isolates showed susceptibility to ceftazidime (75.0%) and a high sensitivity (79.2% of isolates) to gentamycin and 62.5% isolates were sensitive to ofloxacin. Also in a study by Gül et al. (2006), *P. aeruginosa* strains were susceptible to ceftazidime (100.0%), ciprofloxacin (92.0%), and gentamycin (85.0%). In a study by Okesola and Fasina (2012), ciprofloxacin demonstrated the highest susceptibility rates for *P. aeruginosa* (77.4%) and *Klebsiella* species (59.1%). In that same study, all the pathogens demonstrated nil susceptibility towards cefixime except *E. coli* where the susceptibility rate was 40%.

Ciprofloxacin is an effective and safe therapy for AOM and chronic suppurative otitis media (CSOM) (Force *et al*., 1995). Zipfel (1999) reported that the efficacy and safety of a combination of topical dexamethasone 0.1% and ciprofloxacin 0.3% in children with (AOM), otorrhoea resolved more rapidly with that combination preparation than with ciprofloxacin alone and produce significantly greater clinical responses early after completion of seven days course of treatment. The high susceptibility demonstrated towards ciprofloxacin is similar to what was reported in another study where *P. aeruginosa* demonstrated 100% susceptibility to ciprofloxacin (Ettehad et al., 2006; Okesola and Fasina, 2012).

Also in this study, gentamycin (83.3%), ceftazidime (81.2%) and ciprofloxacin (79.2%) were the most effective antibiotic to *S. aureus* isolates. Sensitivity of *S. aureus* to cefuroxime and cefotaxime was 58.2%. This study disagrees with Saini et al. (2005) who reported that sensitivity of *S. aureus* to cefuroxime was 72.2% while that of gram negative bacilli was higher to cefotaxime (90 to 100%). Gül et al. (2006) reported *S. aureus* strains to be susceptible to vancomycin (100.0%), ciprofloxacin (91.0%), and gentamycin (63.0%).

About 87.5% of *Proteus species* isolated from inoculates showed sensitivity to ceftazidime and ciprofloxacin. It also showed 83.0% sensitivity to gentamycin and 66.7% to ofloxacin and cefuroxime. Gül et al. (2006) reported that *Proteus strains* were susceptible to ciprofloxacin (100.0%), ceftazidime (90.0%), and gentamycin (70.0%). The most effective antibiotics to *E. coli* were gentamycin and ceftazidime 44(91.7%). The study also showed that 91.7% *Klebsiella pnuemoniae* were susceptible to ceftazidime, 87.5% were sensitive to gentamycin, streptomycin and ceftriaxone, and 81.3% were sensitive to ofloxacin.

Ofloxacin produced 62.5% to 87.5% sensitivity in both gram positive and gram-negative organisms tested while erythromycin and cloxacillin were not very effective against the isolates.. This slightly differs from the report of Nwabuisi and Ologe (2002) who reported 100.0% sensitivity and that ceftazidime and cefuroxime were highly active (80.0%) against the gram-negative bacteria while erythromycin and cloxacillin were very effective (80.0%) against the gram-positive isolates.

In conclusion, otitis media is still highly prevalent in our environment, affecting mainly children (Nwabuisi and Ologe, 2002). The findings of this study may contribute to an effective medical management of otitis media, since the most common organisms in this clinical set up being *P. aeruginosa*, *S. aureus* and *Proteus species* which showed a percentage susceptibility of 62.5% to 91.7% to most of the antibiotic commonly used in Abeokuta, Nigeria. It was observed that gentamycin and

ceftazidime antibiotics had good sensitivity pattern across all the tested bacterial isolates obtained from ear infections of children in Ogun State, Nigeria. The antibiotic susceptibility pattern of pathogenic isolates is different from those of other regions of Nigeria with increasing resistance recorded for some organisms (Nwabuisi and Ologe, 2002). Appropriate knowledge of antibacterial susceptibility of microorganisms will contribute to rational antibiotic usage and the success of treatment for otitis media (Gül et al., 2006).

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