

AEROBIC BACTERIA ASSOCIATED WITH OTITIS MEDIA IN WARRI, NIGERIA.

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Analysis of the middle ear exudates of 150 children (aged 1-10yrs) with otitis media in Warri, Nigeria indicated a bacterial aetiology of this disease. Ear swabs were collected and cultured on suitable laboratory media. Bacteria species isolated included *Pseudomonas* spp. (22.2%), *Staphylococcus epidermidis* (18.1%), *Staphylococcus aureus* (16.7%), alpha-hemolytic streptococci (15.3%), beta-hemolytic streptococci (13.9%), *Klebsiella* species (4.2%), *Proteus* species (2.8%) and *E. coli* (1.4%). Instances of mixed infection occurred in 25 of the ear aspirates.

INTRODUCTION

Otitis media, as defined by Paparella (1982), is the inflammation of the middle ear sometimes associated with an upper respiratory tract infection. Meyerhoff and Giebink (1982) have reported that otitis media could be divided to include the following distinct groups: AOM (acute purulent otitis media), SOM (serous otitis media), MOM (mucoid or secretory otitis media) and COM (chronic otitis media). Acute otitis media (AOM) is encountered in all parts of the world in warm and cold regions alike. The prevalence of AOM has been studied in communities, which lack modern facilities for treatment.

Otitis media can occur in many ways as is observed in Otomycoses (Enweani and Igumbor, 1997). The majority of patients suffer from AOM before the age of seven (7) (Brownlee *et al.*, 1969; Howei, *et al.*, 1975). The incidence peak is at the age of 1-2 years. Cheesbrough (1985) reported that *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Staphylococcus aureus*, *Streptococcus pyogenes* and *Pseudomonas aeruginosa* commonly cause the middle ear infections. Viruses have also been implicated in middle ear infection (Klein, 1980). These include cosackie B₄ or Adenovirus and syncytial virus. Bacterial species, which cause purulent otitis media, have been identified as *H. influenzae* and *Streptococcus pneumoniae* in approximately 70% of all episodes (Howei *et al.*, 1970). Enweani and Igumbor, (1997) studied the prevalence of otomycoses in malnourished children in Edo State, Nigeria and found that out of the 200 ear

swabs examined, 64 (32%) yielded fungal growth. The fungal isolates included *Aspergillus niger*, *A. fumigatus*, *Penicillium notatum*, *Candida albicans* and *Fusarium solani*. The present study is aimed at identifying the bacterial isolates and their prevalence in children with otitis media.

MATERIALS AND METHODS

A total of 150 ear swabs were collected from patients' (aged 1-12 years) showing clinical signs of ear infections (diagnosed by physicians). The samples were collected from Central Hospital, Warri, General Hospital, Ekpan and General Hospital, Ughelli.

Out of the 150 patients sampled, 15 of them had no ear discharge, while 135 of them had ear discharge. Samples were collected with sterile swab sticks after the auditory meatus had been cleaned with 75% ethanol to avoid contamination. The swab specimens containing the purulent exudate were inoculated on Nutrient agar plates, Blood agar plates, MacConkey agar plates, Triple sugar iron plates and Chocolate agar plates. Inoculated plates were incubated at 37°C aerobically and observed for between 24-48h. The bacterial isolates were identified using Bergey's Manual of Determinative Bacteriology. The results were subjected to a two tail ANOVA.

Table 1: Percentage occurrence of aerobic bacteria in otitis media ear swabs.

Bacteria	No. of isolates	% occurrence
<i>Pseudomonas aeruginosa</i>	16	22.2
<i>Staphylococcus epidermidis</i>	13	18.1
<i>Staphylococcus aureus</i>	12	16.7
α-hemolytic streptococci	11	15.3
β-hemolytic streptococci	10	13.9
<i>Klebsiella</i> spp.	3	4.2
<i>Proteus</i> spp.	2	2.8
<i>Escherichia coli</i>	1	1.4
Others	4	5.6
Total	72	100

RESULTS

Growth was recorded in 105 (75%) samples out of the 150 ear swabs collected. From this, 72 bacterial isolates were obtained, characterised and identified. The result shows that aerobic bacteria were isolated in 69.4% (104) of the ear swabs collected. The bacterial species isolated were *Pseudomonas aeruginosa* (22.2%), *Staphylococcus epidermidis* (18.1%), *Staphylococcus aureus* (16.7%), alpha-hemolytic streptococci (15.3%) and beta-hemolytic streptococci (13.9%). Other organisms isolated in lesser amounts include *Klebsiella* species (4.2%), *Proteus* species (2.8%) and *E. coli* (1.4%) as shown in Table 1.

DISCUSSION

The predominant aerobic bacteria isolates present in this study included *Pseudomonas aeruginosa* (22.2%), *Staphylococcus epidermidis* (18.1%), *Staphylococcus aureus* (16.7%), alpha-hemolytic streptococci (15.3%) and beta-

Table 2: Bacterial isolates from patients according to sex.

Bacteria	Female	Male
<i>Pseudomonas aeruginosa</i>	10	6
<i>Staphylococcus epidermidis</i>	8	5
<i>Staphylococcus aureus</i>	6	6
α-hemolytic streptococci	7	4
β-hemolytic streptococci	4	6
<i>Klebsiella</i> spp.	2	1
<i>Proteus</i> spp.	2	0
<i>Escherichia coli</i>	1	0
Others	2	2
Total percentage	58.33	41.67

$t_{\alpha 0.05} df 14 = 2.145$

hemolytic streptococci (13.9%). Other organisms less frequently isolated included *Klebsiella* species (4.2%), *Proteus* species (2.8%) and *E. coli* (1.4%). The results show that *Pseudomonas aeruginosa* is the major organism isolated, and hence the major causative agent of purulent ear discharges. This is in agreement with the report of Kenna and Bluestone (1986) that *Pseudomonas aeruginosa* is the major aetiologic agent of otitis media. The prevent rate of *Staphylococcus epidermidis* is in line with the work of Lim and DeMaria (1982) and Healy and Teele (1979).

The results also show that females had a higher incidence of bacterial isolation compared to the males (Table 2). This was statistically different in the two sexes. The high isolation rate could be due to some environmental factors and personal hygienic measures. Although the children sampled are not matured enough to take good care of themselves, parents and housemaids, perhaps, do not take enough time to clean the children especially their ears.

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DISCUSSION