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RESEARCH ARTICLE

EFFECTS OF GENDER AND SEASONAL VARIATION ON THE PREVALENCE OF OTITIS MEDIA AMONG YOUNG CHILDREN IN OWERRI, IMO STATE NIGERIA

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ABSTRACT

The study is aimed at determining the effects of gender and seasonal variations on the prevalence of Otitis Media among children of five years & younger as well as susceptibility profile of the bacterial agents in Owerri, Imo State Nigeria. Ear discharge from 156 (80 males and 76 female) patients with signs and symptoms of Otitis Media were processed to recover bacterial agents. Susceptibility test was performed on all bacterial Isolates. *Pseudomonas aeruginosa* (40.1%) was the predominant bacterial isolate causing otitis media followed by *Staphylococcus aureus* (29.6%), *Escherichia coli* (16.5%), *Streptococcus pneumonia* (5.3%), *Serratia marcescens* (2.0%), *proteus mirabilis* (3.3%) and klebsiella spp (0.6%).137 had a single organism isolated from the middle ear culture while fifteen (9.9%) patients had mixed organisms isolated. Gender and seasonal variations did not affect the overall prevalence of Otitis Media (P>0.05).All bacterial Isolates showed fairly susceptible to the antibacterial agent used. An overall prevalence of 87.8% of bacteriologically proven otitis media was observed in this study. Following the high level resistance observed, rational use of antibacterial agents is advocated.

INTRODUCTION

Otitis media both acute and chronic is highly prevalent worldwide (Ologe and Nwawolo, 2002). Otitis media is inflammation of the middle ear drum & the inner ear, including a duct known as the Eustachian tube. Otitis media is very common in children (Aich *et al*., 2009). Children below the age of seven years are much more susceptible to otitis media since the Eustachian tube is shorter and at a more of a horizontal angle than in the adult and this is also because they have not developed the same resistance to bacteria, fungi and viruses as found in adults (koksal and Reisi, 2002). Exposure to smoke, crowded living conditions and low socio-economic class are among the risk factor of otitis media (Pukander *et al*., 2012).Over 50 percent of the cases of otitis media are caused by bacteria(Ogisi and Osamor,1992).Occasionally, Otitis media may be caused by fungi, viruses, Mycoplasma pneumonia and Chlamydia trachomatis (Nwabuisi & Ologe, 2002).

To our knowledge, there is no report on the prevalence of Otitis media in Owerri, Imo State. Against this background, this study is aimed at determining the prevalence of Otitis media as well as the effects of gender and seasonal variations on the prevalence. The bacterial aetiology and susceptibility profile will also be assessed.

MATERIAL AND METHODS

Study Area

The study was carried out at Federal Medical Centre Owerri, Imo State, Nigeria from September 2013 to August, 2014. Owerri is the Headquarter of Imo State. The occupants are mainly civil servants, traders, lecturers and students. Federal Medical Centre Owerri, is a tertiary hospital with a referral status and serves the many Private Hospitals, Government owned Specialist Hospitals, Primary Healthcare Centres in the state and neigbhouring States.

Study Population

A total of 156 (80 males and 76 females) patients with signs and symptoms of Otitis media were recruited for this study. Their ages (from O to 5years) were noted. Ear discharges were

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collected from each patient and transported to the laboratory immediately for analysis. Verbal informed consent was obtained from the parents or guardians of the children prior to specimen collection. The Ethical committee of Federal Medical Centre Owerri approved the protocol for this study. Specimen processing; The specimens were inoculated onto blood, chocolate and MacConkey agar plates. All plates were incubated for 48hours aerobically with the exception of chocolate agar that was incubated in a candle jar. Emergent colonies were identified according to standard bacteriological methods. Disc susceptibility test was performed according to NCCLS method.

Statistical Analysis

Data were analyzed using chi square (x2) test using the statistical software Spss v16. P value of less than 0.05 was considered significant.

RESULT

From the 156 patients enrolled in the study, there were 152 isolates including *Candida* species. One hundred and thirty seven patients (90.1%) had a single organism isolated from the middle ear culture, while 15 (9.9%) patients had mixed organisms isolated. *Pseudomonas aeruginosa* was the most prevalent etiologic agent of Otitis media while the least was *klebsiella Spp* (table 1).

Table 1 Prevalence of bacterial etiological agents of Otitis media

Organism isolated	Total No of isolates (%)
Staphylococcus aureus	45 (29.6)
Escherichia coli	25 (16.5)
Klebsiella spp	1 (0.6)
Proteus spp	5 (3.3)
Streptococcus pneumonia	8 (5.3)
Pseudomonas aeruginosa	61 (40.1)
Serratia marcescens	3 (2.0)
Candida spp	7 (4.6)
Total	152

Table 2 Effect of gender in prevalence of otitis media

Gender	No tested	No infected (%)
Male	80	69 (86.3)
Female	76	68 (89.5)
Total	156	137 (87.8)

Male versus female x 2 test P > 0.05

Table 3 Effect of gender and seasonal variation in the prevalence of bacterial otitis media

	Male		Female		Total
	No treated	infected No (%)	No treated	infected No (%)	No treated
Dry	29	24 (82.8)	37	31 (83.8)	66
Rainy	51	45 (88.2)	39	37 (94.9)	90

The effect of male gender on prevalence of Otitis media was not significant to that of female gender (P>0.05).

Out of 156 patients enrolled in the study, presenting with clinical manifestation of otitis media 137 patients (87.8%) were found with otitis media of bacterial etiology.

Seasonal variation (dry versus rainy season) did not affect the overall prevalence of otitis media (P > 0.05), though it was 83.3% in the dry season and 91.1% in the rainy season.

DISCUSSION

Otitis media is frequently encountered in tropical and subtropical (supiyanphun and luengvarinkul,1997). Diagnosis of this disease is often based solely on the clinical symptoms. This study aimed at determining the effect of gender and seasonal variation of the prevalence of Otitis media among children of five years and younger, as well as to identify their bacterial and fungal agents and their susceptibility patterns.

An overall prevalence of 87.8% patients with signs and symptoms of Otitis media had bacterial and fungal aetiologies. *Pseudomonas aeruginosa* was the predominant isolate causing the otitis media generally. This is in agreement with the previous studies in Nigeria but different from studies in developed countries where *Streptococcus pneumonia*, *Haemophilus influenza* and Moraxella catarrhalis predominate other bacterial isolates recovered in descending order where *Staphylococus aureus*, *Escherichia coli*, *Streptococcus pneumonia*, *Proteus Spp*, *Serratia marcescens* and *klebsiella Spp*. Despite the fact that fungal cultural techniques were not carried out, about 4.6% of the entire recovery was accredited to Candida spp. It was reported that middle ear infection without bacteria may contain viruses, *Chlamydia trachomatis* and pneumonae are possible pathogens as well fungi (Brook and Gober, 1998). Virological, fungi, Chlamydia and Mycoplasma culture or studies were not carried out and thus may be responsible for culture negative Otitis media.

Male gender was observed not to be significant risk factor for Otitis media which contradicts the previous reports (Nwabuisi and Ologe, 2002). Seasonal variation did not affect the prevalence of the Otitis media. The susceptibility profile of the bacteria isolates recovered revealed high level resistance. Prescriptions of antibiotics without laboratory guidance as well as over the counter sales of antibiotics without prescription is common in the Nigeria setting and have been suggested as possible reason for increase resistance observed in the country.

Table 4 Antibiotics susceptibility profile of the bacterial isolates

		Antibacterial Agent						
Isolate	No of isolate	AMX	E	AUG	CN	CAZS	CRX	CFX
Staphylococcus aureus	45	10 (22.2)	8 (17.8)	20 (44.4)	25 (55.6)	34 (75.6)	23 (51.1)	28 (62.2)
Escherichia coli	25	4 (16.0)	4 (16.0)	9 (36.0)	10 (40.0)	15 (60.0)	10 (40.0)	12 (48.0)
Klebsiella spp	1	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)	1 (100.0)	1 (100.0)
Proteus spp	5	1 (20.0)	0 (0.0)	2 (40.0)	3 (60.0)	3 (60.0)	2 (40.0)	2 (40.0)
Streptococcus pneumonia	8	2 (25.0)	4 (50.0)	3 (37.5)	2 (25.0)	6 (75.0)	5 (62.5)	4 (50.0)
Serratia marcescens	3	0 (0.0)	0 (0.0)	1 (33.3)	2 (66.7)	2 (66.7)	2 (66.7)	1 (33.3)
Pseudomonas aeruginosa	61	0 (0.0)	0 (0.0)	1 (1.6)	43 (70.5)	32 (52.5)	27 (44.3)	23 (37.7)

Amx: Amoxycillin,E: Erythromycin, Aug: Augmentin, Cn: Gentamicin, Caz: Ceftazidine, Crx: Cefuroxime: Cfx: Ceftriaxone

CONCLUSION

An overall prevalence of 87.8% of otitis media was observed among patients attending the ear, nose and throat clinic in Federal Medical Centre, Owerri, and Imo State, Nigeria. *Pseudomonas aeruginosa* was the predominant bacterial isolate causing Otitis media. Susceptibility profile was generally poor and rational use of antibiotics is advocated.

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