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RESEARCH ARTICLE

Prevalence of Otitis Media among Patients Attending Ear, Nose and Throat Clinic

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Abstract

Otitis media is a group of inflammatory diseases of the middle ear. One of the two main types is acute otitis media (AOM), an infection of rapid onset that usually presents with ear pain. Otitis media is a significant public health concern, particularly in low-income communities. This study aimed to determine the prevalence of otitis media among patients attending the clinic at Our Lady of Lourdes Hospital Complex, Ihiala, Anambra State, Nigeria. It was analysed using the Cultural, gram staining and identification teste methods. A total of 120 participants were examined, and 12 (10%) showed positive results for otitis media. The isolated pathogens included Staphylococcus aureus, Streptococci, and Pseudomonas aeruginosa. The prevalence of otitis media varied among different age groups, with the highest rate of 30% observed among the 25-34 years age group. The Prevalence of otitis media among different gender is higher in females (12.5%). The findings of this study highlight the need for improved prevention and management of otitis media in this region. Regular ear examination and public awareness campaigns are essential for reducing the burden of otitis media on the public.

Keywords: Otitis Media, Prevalence, Middle Ear Infection, Bacterial Pathogens, Public Health.

1. Introduction

Otitis media is a group of inflammatory diseases of the middle ear. One of the two main types is acute otitis media (AOM), an infection of rapid onset that usually presents with ear pain. (Minovi and Dazert, 2014).

Otitis media describes a group of related conditions that may be acute or chronic in duration, and further categorized into different types based on clinical presentation, onset of symptoms, associated complications, and treatment. The various subtypes include acute otitis media, otitis media with effusion, chronic suppurative otitis media, and adhesive otitis media. In addition, isolated diseases of the tympanic membrane, such as inflammation (myringitis) or the accumulation of granulation tissue on the surface of the tympanic membrane (granular myringitits), are also possible inflammatory disorders of the middle ear.

In young children this may result in pulling at the ear, increased crying, and poor sleep. Decreased eating and a fever may also be present. The other main type is otitis media with effusion (OME), typically not associated with symptoms, although occasionally a feeling of fullness is described; it is defined as the presence of non-infectious fluid in the middle ear which may persist for weeks or months often after an episode of acute otitis media. Chronic suppurative

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otitis media (CSOM) is middle ear inflammation that results in a perforated tympanic membrane with discharge from the ear for more than six weeks. It may be a complication of acute otitis media. Pain is rarely present. All three types of otitis media may be associated with hearing loss. If children with hearing loss due to otitis media effusion do not learn sign language, it may affect their ability to learn.

The cause of acute otitis media is related to childhood anatomy and immune function. Either bacteria or viruses may be involved (Marom *et al*., 2012). Risk factors include exposure to smoke, use of pacifiers, and attending daycare. It occurs more commonly among indigenous Australians and those who have cleft lip and palate or Down syndrome. Otitis media effusion frequently occurs following AOM and may be related to viral upper respiratory infections, irritants such as smoke, or allergies. Looking at the eardrum is important for making the correct diagnosis. Signs of acute otitis media include bulging or a lack of movement of the tympanic membrane from a puff of air. New discharge not related to otitis external also indicates the diagnosis.

A number of measures decrease the risk of otitis media including pneumococcal and influenza vaccination, breastfeeding, and avoiding tobacco smoke. The use of pain medications for AOM is important. This may include paracetamol (acetaminophen), ibuprofen, benzocaine ear drops, or opioids. In acute otitis media, antibiotics may speed recovery but may result in side effects (Sjoukes *et al*., 2016). Antibiotics are often recommended in those with severe disease or under two years old. In those with less severe disease they may only be recommended in those who do not improve after two or three days. The initial antibiotic of choice is typically amoxicillin. In those with frequent infections tympanostomy tubes may decrease recurrence. In children with otitis media with effusion antibiotics may increase resolution of symptoms, but may cause diarrhoea, vomiting and skin rash. (Emmett, 2018).

Worldwide, acute otitis media affects about 11% of people a year (about 325 to 710 million cases). Half the cases involve children less than five years of age and it is more common among males. Of those affected about 4.8% or 31 million develop chronic suppurative otitis media. The total number of people with chronic supportive otitis media is estimated at 65–330 million people. Before the age of ten OME affects about 80% of children at some point. Otitis media resulted in 3,200 deaths in 2015 – down from 4,900 deaths in 1990. (Coker *et al,* 2010).

Otitis media, a common ear infection, poses a significant health burden globally, particularly in developing countries like Nigeria.

In Nigeria, otitis media is a leading cause of hearing loss, ear pain, and discomfort, affecting individuals of all ages, especially children and adults in low-income communities. The lack of adequate healthcare infrastructure, limited access to specialist care, and inadequate health education contribute to the high prevalence of otitis media. Our Lady of Lourdes Hospital Complex, Ihiala, Anambra State, Nigeria, serves as a primary healthcare provider for the local population. However, there is a low data on the prevalence of otitis media among patients attending this clinic. The consequences of untreated or inadequately treated otitis media are severe, leading to complications such as hearing loss, speech impairment, and cognitive delays in children, and decreased productivity and quality of life in adults. Furthermore, otitis media increases the risk of developing chronic conditions like chronic suppurative otitis media and cholesteatoma. Factors contributing to the high prevalence of otitis media in Nigeria include poor environmental sanitation, inadequate vaccination, and limited access to healthcare services. Additionally, cultural and socioeconomic factors, such as self-medication and traditional practices, exacerbate the problem.

To address this critical concern, it is essential to determine the prevalence of otitis media among patients attending the clinic at Our Lady of Lourdes Hospital Complex, Ihiala.

2. Materials and Methods

2.1 Study Area and Population

The study was carried out among 120 patients attending clinic in Our Lady of Lourdes Hospital Complex, Ihiala Anambra State, Nigeria.

2.2 Sampling Techniques

Ear swab was collected for Isolation and identification of pathogens using culture method with blood agar

2.3 Study Design

This was a cross-sectional study

2.4 Ethical Approval

A letter of introduction was obtained from the head of department and approval was received appropriately from the patients.

2.5 Materials

- Report book and pen

- Sample
- Sterile swab stick
- Petri dish
- Incubator
- Culture media(blood agar)

2.6 Method of Analysis

- The melted Agar was poured aseptically in a sterile petri dish
- It was allowed to solidify and set
- The sample was inoculated on the media
- It was incubated at 370c for 24hrs

2.6.1 Identification of bacteria using Gram staining procedure

- A smear was fixed in the glass slide by passing it twice on the bursen flame
- It was stained with crystal violet for 2 minutes.
- It was washed with water.
- It was stained with a mordant using Lugol's iodine for 2 minutes.
- It was washed with water.
- It was decolourise with acetone for 2 seconds.
- It was washed with water.
- It was counterstained with 0.5% aqueous solution of neutral red
- It was washed with water, blot dry and examined with oil immersion.

Results

Gram positive bacteria: blue-black

Gram negative bacteria: : red

2.6.2 Identification using Biochemical Tests

Catalase test

- The colony of the organism was emulsify in distilled water on a clean slide placed in a petri dish.
- Two drops of H2O was added and the dish was covered
- Gas bubbles indicates a positive reaction.

Result: Staphylococus species- positive

Streptococcus species - negative

Oxidase test

- A few drops of the oxidase reagent was added to the colony on the culture plate
- The colony was observed until it become blue to deep purple within 5-10 secs

Results: *Pseudomonas aeruginosa* - positive

E.coli- negative

3. Results

A total number of hundred and twenty (120) participants were examined to determine the Prevalence of otitis media in Our Lady of Lourdes Hospital Complex, Ihiala Anambra State Nigeria.

Table 1 shows that Out of 120 samples examined, 12(10%) showed positive while 108(90%) showed negative. Out of the twelve (12) positive samples staphylococcus aureus, streptococci and *Pseudomonas aeruginosa* were isolated as the casuative agent of otitis media and *staphylococcus aureus* appears as the most prevalent bacteria that causes otitis media

Table 2 shows the Prevalence of otitis media among different age groups, Out of 63 samples, 4(7%) tested positive while 59(93%) tested negative. *Staphylococcus aureus* and Streptococci were isolated from this group. From the age group of 25-34yrs, 20 samples were examined 6(30%) tested positive while 14(70%) tested negative. *Staphylococcus aureus*, Streptococci and *Pseudomonas aeruginosa* were isolated. Out of 37 samples examined from the age group of 35-46yrs, 2(5%) tested positive while 35(95%) tested negative. Pseudomonas aeruginosa and *Staphylococcus aureus* were isolated from these groups.

Table 3 shows that Out of 56 male participants examined, 4(7%) tested positive and *Staphylococcus aureus* and Streptococci was majorly isolated from these groups while the female participants had the highest Prevalence of 8(12.5%) out of the 64 samples examined and yielded growth of *Pseudomonas aeruginosa* and *Staphylococcus aureus*

Table 1. *Prevalence of otitis media among participants*

Out of 120 samples examined, 12(10%) tested positive to otitis media while 108(90%) were negative.

Sample	No of sample examined	No of positive sample	No of negative sample
Ear swab	120	12(10%)	108(90%)

Table 2. *Prevalence of Bacteria Isolates*

Out of the 120 samples examined, 12(10%) tested positive and *Staphylococcus aureus* is the most prevalent bacteria.

Sample	No of Isolates	Bacteria isolates
Ear swab	7	*Staphylococcus aureus*
	3	Streptococcus
	2	Pseudomonas aeruginosa
Total	**12(10%)**	

Table 3. *Prevalence of otitis media among different age groups*

Out of 63 samples examined from the age group of 18-24 yrs, 4(7%) were positive and yielded growth to *Staphylococcus aureus* and streptococci. 20 samples were examined from the age group 25-34yrs and 6(30%) tested positive. They yielded growth of *Staphylococcus aureus,* Streptococci *and Pseudomonas aeruginosa.* From the age group of 35-46 yrs, 37 samples were examined, 2(5%) tested positive and yielded growth of *Pseudomonas aeruginosa and Staphylococcus aureus.*

Age group	Sample	No of sample Examined	No of positive sample	No of negative sample	Isolates
18-24yrs	Ear swab	63	4(7%)	59(93%)	*Staphylococcus aureus Streptococci*
25-34yrs		20	6(30%)	14(70%)	*Staphylococcus aureus, streptococci, pseudomonas aeruginosa*
35-46yrs		37	2(5%)	35(95%)	*Pseudomonas aeruginosa, Staphylococcus aureus*
Total		**120**	**12(10%)**	**108(90%)**	

Table 4. *Prevalence of otitis media among different gender*

Out of 56 male participants examined, 4(7%) tested positive while the female participants had the highest Prevalence of 8(12.5%) out of the 64 samples examined.

Gender	No of sample examined	No of positive sample	No of negative sample	Isolates
Male	56	4(7%)	52(93%)	*Staphylococcus aureus, streptococci*
Female	64	8(12.5%)	56(87.5)	*Pseudomonas aeruginosa, Staphylococcus aureus*
Total	**120**	**12(10%)**	**108(90%)**	

4. Discussion

The results of this study shows prevalence of otitis media among patients attending the clinic at Our Lady of Lourdes Hospital Complex, Ihiala, Anambra State, Nigeria. Out of 120 samples examined, 12 (10%) showed positive results for otitis media, while 108 (90%) showed negative results. The isolated pathogens included *Staphylococcus aureus, Streptococci,* and *Pseudomonas aeruginosa* and *staphylococcus aureus* is the most prevalent bacteria Isolate. The age group distribution of otitis media revealed varying prevalence rates. Among the 18-24 years age group, 4 (7%) out of 63 samples tested positive, with Staphylococcus aureus and Streptococci being the isolated pathogens. This age group is more susceptible to otitis media due to their frequent exposure to respiratory tract infections. Lifestyle habits etc. The 25-34 years age group had the highest prevalence rate, with 6 (30%) out of 20 samples testing positive. *Staphylococcus aureus, Streptococci,* and *Pseudomonas aeruginosa* were isolated from this group. This age group may be more prone to otitis media due to increased exposure to environmental factors, such as air pollution and tobacco smoke, which can compromise the middle ear's defense mechanisms.

In contrast, the 35-46 years age group had a relatively low prevalence rate, with 2 (5%) out of 37 samples testing positive. Pseudomonas aeruginosa and Staphylococcus aureus were isolated from this group. This age group may be less susceptible to otitis media

due to increased immunity and better ear hygiene practices. The isolated pathogens, *Staphylococcus aureus, Streptococci,* and *Pseudomonas aeruginosa*, are common causes of otitis media.

The results of the study revealed that the prevalence of otitis media was higher among female participants (12.5%) compared to male participants (7%). This finding suggests that females may be more susceptible to otitis media than males. One possible reason for the higher prevalence of otitis media among females is the difference in ear anatomy between males and females. Females tend to have smaller ear canals, which can make them more prone to ear infections (Masuda *et al*., 2021). Additionally, hormonal changes during menstruation and pregnancy may also contribute to the higher prevalence of otitis media among females (Swain, 2022; Swain *et al*., 2020; He and Ren 2018). Another possible reason for the higher prevalence of otitis media among females is the difference in exposure to risk factors. Females may be more likely to engage in activities that increase their risk of developing otitis media, such as swimming or using earbuds (Zia *et al*., 2019).

The lower prevalence of otitis media among males (7%) may be due to various factors, including better ear hygiene practices, reduced exposure to risk factors, or differences in ear anatomy.

5. Conclusion

In conclusion, the prevalence of otitis media among patients attending clinic in Our Lady of Lourdes Hospital Complex Ihiala is relatively low. However, there is need to fight against this disease in order to improve the patients and community health.

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