

Original Research Article

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## Otitis externa in a tertiary hospital in the South-South region of Nigeria: a three year review

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### ABSTRACT

**Background:** Certain climatic conditions tend to favor the development of some ear infections and inflammations especially of the external ear. Otitis externa connotes the inflammation of the external ear and tends to occur commonly. This study is aimed at determining the frequency of occurrence, the type of otitis externa and management of patients seen in an ear nose and throat clinic in Port Harcourt.

**Methods:** A retrospective review of all patients diagnosed with otitis externa within the period of January 2017 to December 2019. The diagnosis was mainly clinical. The clinic registers and patient's case files were the source of data. Data sought included demographics, clinical features, forms and management of otitis externa. Patients with incomplete data were excluded. Data extracted were then analyzed using IBM statistical package for social sciences (SPSS) 25 version. Results were presented in scientific tables and figures.

**Results:** There were a total number of 1296 of patients with otitis externa. Prevalence of otitis externa in the study was 28.77%. There were 54.2% females and 45.8% males with a ratio of 1.4:1. The age group 21-30 years was the age group most affected; n= 404 (31.2%). Chronic otitis externa was the commonest form seen; 74.8%. Unilateral affection was commoner, seen in n=1073 (82.8%). Debris in the ear was found to be the commonest clinical feature followed by otalgia; 31.1% and 29.6% respectively. The treatment was mainly medical; comprising systemic and topical broad spectrum antibiotics, topical antifungal and steroidal drops, and aural toileting with wick dressing and analgesics. There were no major complications noted.

**Conclusions:** Otitis externa is common in the ORL clinic and the diagnosis is often based on history and physical examination. The chronic form is the commonest type encountered and treatment is mainly empirical.

**Keywords:** Otitis externa, Prevalence, Chronic, Acute

### INTRODUCTION

Otitis externa can involve any part of the external ear. The external auditory canal (EAC) and the auricle can both be affected. It can also occur in any age group however it is uncommon in age less than 2 years.<sup>1-3</sup> The inflammation which could be infectious or non-infectious can be from bacterial or fungal invasion or simply from dermatitis. It can be acute or chronic. It is a condition that can be

commonly seen among patients attending the Ear Nose and Throat (ENT) clinic and often a common cause of earache.<sup>4</sup>

The EAC is covered by hair follicles and ceruminous glands. The cerumen provides a protective barrier and an acidic environment that inhibits bacterial and fungal growth.<sup>5</sup> Therefore when there is disruption of the normal pH of the auditory canal and hence loss of the normal

protective lipid/acid balance of the ear for any reason, otitis externa can result.<sup>6,7</sup> Different factors that can predispose to otitis externa include; High humidity, absence of cerumen, local trauma and this could be from use of fomites in the ear for example cotton swabs, hearing aids, ear plugs, dermatological conditions like eczema etc. The pH suppresses both bacterial and fungal growth hence aquatic sports such as swimming and surfing can predispose to this condition because the constant exposure to water tends to wash out the cerumen, altering the pH and leading to dryness of the canal and resulting in inflammations and infections.<sup>8</sup> There is therefore a fivefold increase in the incidence in swimmers.<sup>9</sup> It is also known that excessive use of topical antibiotics drops can give rise to otitis externa because it tends to alter the normal flora of the external ear hence predisposing to fungal overgrowth and invasion by bacteria other than the normal commensals.<sup>10</sup>

This condition though common globally, has a higher incidence in the tropics due to higher temperatures and humidity. There are different forms of otitis externa; acute diffuse, focal or circumscribed, chronic and malignant or necrotizing otitis externa.<sup>11</sup> It is known that more than 90% of the cases is caused by bacteria and the commonest involved is *Pseudomonas aeruginosa* and *staphylococcus aureus* even though polymicrobial infection commonly occurs.<sup>9,13</sup> Fungal organisms are more common causes of chronic infections than acute infections with the *Aspergillus* species implicated in 60-90% of the cases followed by *Candida* in 10-40%.<sup>12,13</sup> Otomycosis is found 1 in every 8 cases of otitis externa and some researchers postulate that 10% of patients with symptoms of otitis externa are fungal.<sup>14,15</sup> Diagnosis is often made by history and physical examination including otoscopy and otomicroscopy.<sup>16</sup> However, there is a place for audiological assessment so as to rule out middle and inner ear involvement. It is known that although it is a disease affecting the external ear, there could be a middle and inner ear extension attributable to underlying osteitis and osteomyelitis.<sup>3,17,18</sup>

The prevalence of otitis externa available in literature differs, possibly due to the fact that these studies were carried out in different geographic areas. Musa et al in Kaduna had 1.0% while Ayotunde et al in Ibadan had 4.3%.<sup>19,20</sup> In an earlier study of otologic conditions in the South- South region of Nigeria, a prevalence of 21.25% was obtained for otitis externa.<sup>21</sup> This study therefore is to determine the prevalence of otitis externa, the types and their management in UPTH.

## METHODS

A retrospective review of all patients diagnosed with otitis externa seen in the Ear Nose and Throat Surgery department of University of Port Harcourt teaching Hospital Port Harcourt within the period of January 2017 to December 2019. Ethical approval for the study was obtained from the hospital ethical committee. The

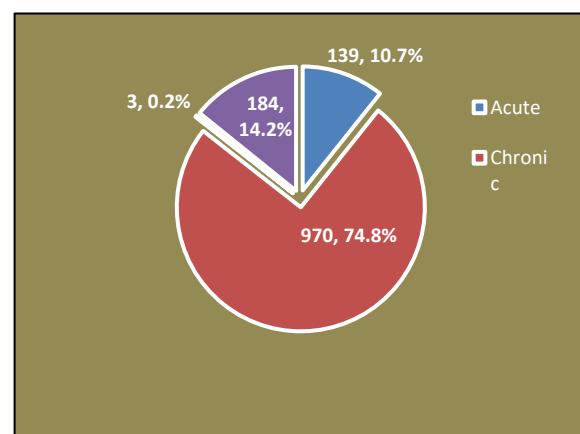
diagnosis was mainly clinical. Presence of discharge or debris in the ear of a patient with complaints of earache, itching with or without ear blockage with an intact tympanic membrane is taken as otitis externa with or without laboratory confirmation. The clinic registers and patient's case files were the source of data. Data sought included demographics, clinical features, forms and management of otitis externa. Patients with incomplete data as well as patients with perforated tympanic membrane in the absence of ear itching and otalgia were excluded. Data extracted were then analyzed using IBM Statistical package for social sciences (SPSS) 25 version. Results were presented in scientific tables and figures.

## RESULTS

There were a total number of 1296 of patients with otitis externa that met the inclusion criteria seen within the period under study. The total number of new cases seen in the ENT clinic within this period was 4,504 therefore giving the prevalence of otitis externa in the period under study as 28.77%.

**Table 1: Sociodemographic distribution of subjects (n=1296).**

Sociodemographic	Frequency	Percentage
<b>Sex</b>		
Male	593	45.8
Female	703	54.2
<b>Age groups (years)</b>		
<1	55	4.2
1-10	72	5.6
11-20	137	10.6
21-30	404	31.2
31-40	208	16.0
41-50	201	15.5
51-60	139	10.7
61-70	50	3.9
71-80	18	1.4
>80	12	0.9



**Figure 1: Distribution of otitis externa.**

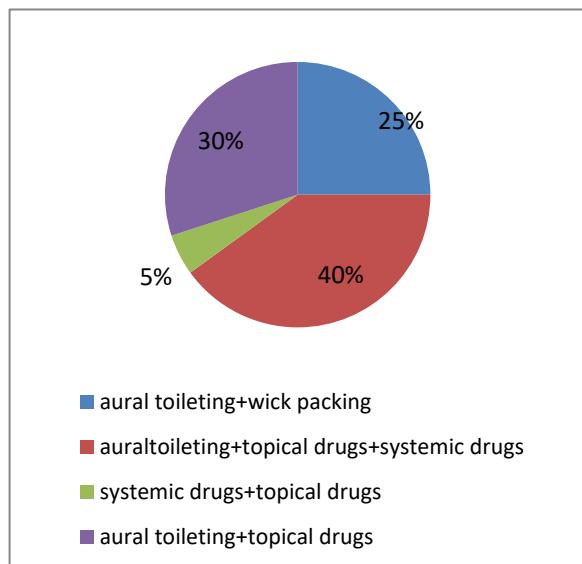
The females comprised 54.2% of this population while the males were 45.8% with a female to male ratio of 1.4:1. However, it was not statistically significant. The age group 21-30 years was the age group most affected; n= 404 (31.2%). The least affected was the age 80+ with 0.9% (Table 1). Chronic otitis externa was the commonest form seen; 74.8% while malignant otitis was least with 0.2%. Acute otitis was seen in n=184 (14.2%) figure 1. Unilateral affection was commoner, seen in n=1073 (82.8%) (Table 2).

**Table 2: Distribution of location by forms of otitis externa.**

	Unilateral	Bilateral	Chi-square (p value)
<b>Acute</b>	119 (11.1)	20 (9.0)	
<b>Chronic</b>	807 (75.2)	163 (73.1)	
<b>Malignant</b>	3 (0.3)	0 (0.0)	4.16
<b>Otomycosis</b>	144 (13.4)	40 (17.9)	(0.244)
<b>Total</b>	1073 (100.0)	223 (100.0)	

The distribution is not statistically significant (p>0.05)

Debris in the ear was found to be the commonest clinical feature followed by otalgia; 31.1% and 29.6% respectively. Oinalgia was the commonest feature seen in acute otitis and malignant otitis while debris in the ear was seen more in chronic form and otomycosis (Table 3).



**Figure 2: Treatment modalities.**

**Table 3: Distribution of presenting symptoms by forms of otitis externa.**

Duration of treatment	Pain	Debris in the ear	Itching	Blockage	Discharge	Chi-square (p value)
<b>Acute</b>	49 (12.8)	42 (10.4)	22 (8.7)	20 (9.3)	6 (15.0)	
<b>Chronic</b>	287 (74.7)	300 (74.4)	197 (77.9)	165 (76.4)	21 (52.5)	
<b>Malignant</b>	2 (0.5)	1 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)	20.24 (0.063)
<b>Otomycosis</b>	46 (12.0)	60 (14.9)	34 (13.4)	31 (14.4)	13 (32.5)	
<b>Total</b>	384 (100.0)	403 (100.0)	253 (100.0)	216 (100.0)	40 (100.0)	

The distribution is not statistically significant (p>0.05)

**Table 4: Duration of treatment by forms of otitis externa.**

Duration of treatment	Acute	Chronic	Malignant	Otomycosis	Chi-square (p value)
<b>2 weeks</b>	38 (27.3)	344 (35.5)	1 (33.33)	61 (33.2)	
<b>3 weeks</b>	29 (20.9)	281 (29.0)	1 (33.33)	56 (30.4)	
<b>4 weeks</b>	46 (33.1)	298 (30.7)	0 (0.0)	63 (34.2)	54.92 (0.0001)*
<b>Lost to follow-up</b>	26 (18.7)	47 (4.8)	1 (33.33)	4 (2.2)	
<b>Total</b>	139 (100.0)	970 (100.0)	3 (100.0)	184 (100.0)	

\*The distribution is statistically significant (p<0.05)

Majority of the patients were treated empirically and resolved on the average, within two to three weeks. About 34.3% of the patients had resolution in 2 weeks. While 31.4% resolved in 4 weeks and 6.0% was lost to follow up. In acute otitis externa, 48.2% resolved in 2 to 3 weeks and 18.7% was lost to follow up. While in chronic, 64.5% were resolved by 2 to 3 weeks and 4.8% was lost to follow up. In otomycosis, 63.6% was treated within 2 to 3 weeks. Malignant otitis had 66.6% resolution within 2 to 3 weeks and the rest was lost to follow up. The three cases of

malignant otitis were also found to have diabetes mellitus. There was no statistically significant difference noted in the distribution for both laterality and symptoms however that of treatment duration and forms of otitis externa was found to be statistically significant with p=0.0001 (table 4).

Ear swab of the ear discharge was not routinely done, it was carried out only in 7 patients and yielded pseudomonas species and staphylococcus species. Most of

the patients were treated empirically. The treatment was mainly medical; comprising systemic and topical broad-spectrum antibiotics, topical antifungal and steroid drops, and aural toileting with wick dressing and analgesics. Majority of the patients were treated with aural toileting, systemic and topical drugs combination; 40%. Only about 5% was treated with systemic and topical drugs only (Figure 2). Ear syringing was the commonest method of aural toileting employed in these patients. There were no major complications noted.

There was no mortality recorded in this study.

## DISCUSSION

The prevalence of 28.77% noted in this present study, appears higher than the findings of 1.0%, 4.3%, 3.4% respectively in Kaduna, Ibadan and Enugu.<sup>19,20,22</sup> Similar to the findings of low prevalence in some of these regions is that found in the United Kingdom and Netherlands which is 1.0%.<sup>23</sup> It is known that the condition is commonly found in areas of high humidity and it is a common condition in swimmers.<sup>8,12</sup> Port Harcourt is an area of high humidity with swimming as a common leisure among the inhabitants; these therefore could explain the high prevalence. It is also noted that the closest to this prevalence is the study in Ado Ekiti with a prevalence of 17.5%.<sup>24</sup> Moreover an earlier study of otologic diseases in the same region gave a prevalence of 21.8% for otitis externa depicting that there is a slight increase in the prevalence.<sup>21</sup>

It is a commonly seen condition in the ORL clinic agreeing with other studies.<sup>4</sup>

The condition was found to be commoner among females similar to a study by Rowlands et al however, the difference was not significant statistically.<sup>2</sup> In contrast, Satish et al had a male preponderance.<sup>15</sup> Though otitis externa can affect all age groups, the adult age groups were more affected with the age group 21-30 years having the highest point prevalence similar to findings of other researchers.<sup>6,15</sup> The prevalence was also noted to decrease after age 60 years similar to the finding in a study in Enugu, but differing from that of Abraham et al where age >65 years were found to be more affected.<sup>22,25</sup> In contrast some other researcher found the peak age to be in 7-12 years age group.<sup>26</sup>

In the present study, chronic otitis externa was found to be the commonest form encountered. This was contrary to some other studies that found the acute otitis externa commoner.<sup>3,26</sup> Malignant otitis was the least type seen similar to most other studies.<sup>24</sup> It was also noted in this study, that otomycosis was the third commonest form. It is known that otomycosis is implicated in about 10% of all cases of otitis externa.<sup>15</sup> Majority of the patients had unilateral affection; 82.8% and this was noted in all the forms of otitis externa similar to other works.<sup>19,22</sup> This could be because most people are more likely to insert

fomites which is a common known predisposing factor of the condition, into their ears one ear at a time. In contrast, Kesser et al found more of bilateral affection.<sup>27</sup>

Debris in the ear and otalgia were the commonest clinical features noted in the study with otalgia being commoner in the acute forms and debris commoner in the chronic form. Similarly the study in Kaduna and Ado Ekiti also found otalgia to be a common clinical feature of acute otitis externa while in contrast, Kesser et al in a study in the USA, found itching and ear blockage to be a common feature in chronic type.<sup>19,24,27</sup> In this study, the diagnosis was clinically based using history and physical examination and only very minimal fraction of these patients had ear swab of the ear discharge carried out. Majority of the patients were also empirically treated. This form of diagnosis was noted to be common in other studies.<sup>16,19,24</sup> The common organisms found in the few that had laboratory investigation yielded pseudomonas and staphylococcus spp similar to the findings from other researchers.<sup>9,19</sup> However, in the study in Ado-ekiti, *Staphylococcus* and *Streptococcus* spp were found to be the commonest organisms involved.<sup>24</sup> This could be because they had more of acute otitis externa. The observation of bacterial infection being a common cause of otitis externa was also noted by Medina-Blasini et al.<sup>28</sup>

Majority were treated medically using systemic and topical drugs. These were often instituted after aural toileting. The commonly employed modality of treatment in these patients was aural toileting with both systemic and topical drugs. The second commonly used modality was the use of topical drugs only, after aural toileting while some had in addition to aural toileting, aural wick dressing done. These gave some good results since most, averagely resolved within two to three weeks of treatment. Other researchers had similar findings.<sup>24,29</sup> The three patients with malignant otitis were among the number that had laboratory investigation and while two resolved with aural toileting, systemic and topical antibiotics and wick dressing one was lost to follow up. There were no complications noted in this study, in similarity to the study in Kaduna.<sup>19</sup> In the present study, there was no statistical significant difference in distribution noted for sex, age and types of otitis externa similar to what was depicted in the study from Tanzania however; there was a statistically significant difference in the distribution of treatment duration and types of otitis.<sup>25</sup> Otitis externa therefore was found to be a common otologic condition seen in the ORL clinic and chronic type was the commonest form encountered in our environment.

## CONCLUSION

Otitis externa is commonly seen in the ORL clinic. The diagnosis is often based on history and physical examination. The chronic form is the commonest type encountered and treatment is mainly empirical with majority resolving within 2 to 3 weeks of such treatment.

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