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Research Article

EPIDEMIOLOGY OF OTITIS EXTERNA IN DEVELOPING COUNTRY

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ABSTRACT

Background: Otitis externa is an otological diseases with common presentation in ear, nose, throat, head and neck practice. This study aimed at determining the prevalence, aetiology, clinical presentation, complications and treatment of otitis externa. **Methods:** This is a prospective hospital based study of patients diagnosed with otitis externa in Ekiti state university teaching hospital, Ado Ekiti. The study was carried out between May 2016 and April 2017. Data were obtained by interviewer assisted questionnaire on ages, gender, presenting symptoms, clinical findings, complication and mode of treatment. Data obtained were collated and analyzed using SPSS version 16. **Results:** Total number of patients seen in ear, nose and throat department were 1875 out of which a total of 329 were diagnosed of otitis externa. Consent was obtained from the participants and they were enrolled into the study. Prevalence in this study stands at 17.5%. There were 54.4% males and 45.6% females with male to female ratio of 1:1. The peak age group at third decade (21-30) was 27.7%. On the occupational status, Students/apprentice 33.0% and applicant 21.1% are the majority while 16.4% farmers and 10.3% housewife are the minority. On marital status, 47.3% single and 28.3% married were the majority. Referral were mainly from the general practitioner and casualty officer as 51.7% and 23.4% respectively. Majority 46.3% of the participants presented within one week of the illness. First episode was noticed in 64.7% while recurrent episode was noticed in 35.3%. Both unilateral otitis externa 76.2% and right otitis externa 51.6% were the commonest. Earache was the major 87.8% presenting complaints while commonest clinical findings in this study was tragal tenderness 83.3%. Major type of diagnosed otitis externa in this study were: acute diffuse otitis externa 49.2%. Ear swab microscopy, culture and sensitivity yielded no growth in 6.4% and growth of Pseudomonas spp, 3.6% Klebsiella 5.5% Staphylococcus aureus 19.5% and Streptococcus spp 10.3% were recorded. Common complications of otitis externa were 12.5% myringitis and 10.6% auricular cellulitis. Majority of cases 72.2% were treated with both topical and systemic drugs, while 27.8% were treated with topical, systemic drugs and otological procedure. During the first follow up visit, 79.1% of the patients had complete symptom resolution. **Conclusion:** Otitis externa is a common otological diseases affecting all age group. Most patients were referred to ear, nose and throat clinic by general practitioner. Most of these patients had preventable associated complications at presentation.

INTRODUCTION

Otitis externa is an otological disorder and it is defined as inflammation of the external component of the ear [1,2]. External ear consist of external auditory canal and auricle (pinna). This inflammatory condition may be reactive (allergic) or infective (viral, bacterial or fungal) origin. Epidemiologically, this conditions occurred worldwide, affect both sex and all age groups [1-5]. The prevalence varied in different region depending on factors such as risk factor and geographical location. It is a common disease condition affecting 5-20% of all patients attending otorhinolaryngology clinic [3-5].

Predisposing factors to otitis externa are numerous. The common factors are bathing external ear with soapy water, swimming, self cleaning of the ear with indiscriminate object, chronic suppurative otitis media, ear operation (Mastoid), ear procedure (syringing) and immunosuppressive state such as diabetes mellitus [6,7]. On aetiopathogenesis, ear wax when too much or too little predispose to otitis externa. The skin's natural defense mechanism are usually breaks down by ear picking, water/soap and so on. These lead to multiplication of resident bacteria because of more favorable environment and other organisms such as Staphylococcus

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aureus, Proteus, Escherichia coli and Pseudomonas species [8-10]. Furunculosis is a localized type of otitis externa from gram positive bacteria. This is caused by Staphylococcus aureus infection of a hair follicles of the cartilaginous portion of external auditory canal. This may be single, multiple and recurrence is very common. When its spontaneous evacuation occurs in few days, a generalized infection of the whole of ear canal leading to diffuse otitis externa may occured. Otomycosis is a fungal infection of the external auditory canal either by primary or secondary superimposed on underlying bacterial infection [11-13]. Malignant Otitis externa is an uncommon, progressive debilitating in elderly, poorly controlled diabetic patients resulting from Pseudomonas aeroginosa. The usual microorganism in patients with low resistance, is Staphylococcus epidermidis while Aspergillus may also be responsible [15,16]. Sometimes this infection may be fatal because of its late presentation, diagnosis, treatment and its extension from external meatus, surrounding soft tissues, skull base and intracranial involvement and complication.

Common complications of inflammatory conditions of external ear includes external ear canal stenosis, myringitis and tympanic membrane perforation, regional dissemination of infection (auricular cellulitis, chondritis, and parotitis), septicemia and progression to malignant otitis externa, which may be fatal. Clinical manifestation of otitis external depends on the anatomical region, offending agent and predisposing factors. Common otological symptoms are earache, discharge from ear, plugged feeling in ear, trouble hearing and ear itch. Other symptoms like dizziness, headache and ringing sensation may be associated. On clinical examination usual findings are nasal congestion, fever, sore throat, Cough, chest infection, neck mass.

For effective treatment of otitis externa, thorough understanding of anatomy and physiology of the external ear canal, knowledge of the microbiology of potential pathogens, and familiarity with clinical presentation, are very essential. The treatment can be local or systemic.

There is paucity of literature on otitis externa in developing country Nigeria is inclusive. This study aimed at determining the epidemiological pattern, complication, clinical features and treatment outcome of otitis externa at Ekiti state university teaching hospital, Ado Ekiti, Nigeria.

METHODS

This is a prospective hospital based study of patients with complaints and diagnosis of otitis externa. This study was carried out in ear, nose and throat department of Ekiti state university teaching hospital, Ado Ekiti.

Ethical clearance was sought for this study from the ethical committee of the institution. This was obtained before the commencement of the study.

The study was carried out over a period of one year, from May 2016 to April 2017. Verbal consent was obtained from patients or guardian. A total number of 239 participants were enrolled into the study.

Data were obtained by using interviews assisted questionnaire. The information obtained include their biodata such as age, sex, occupation, religion, marital status and so on. Detailed otological history and other otorhinolaryngological, head and neck history on the various diseases were obtained. Past medical and surgical history obtained and documented. Their family and social history on alcohol, smoking and so on was obtained. Detailed clinical otorhinolaryngological, head and neck examination were done with emphasis on otological/otoscopy and findings were documented. Participants had audiometric investigation done to arrived at diagnosis. Minor ear nose and throat procedure were given where indicated.

All the otorhinolaryngological, head and neck data obtained were collated and analyzed. This was done by using SPSS version 16. The obtained information were illustrated by using frequency tables, bar chart and pie charts.

RESULTS

The total number of patients seen in the ear, nose and throat department during the cause of this study were 1875.

A total of 329 consented otitis externa participants were enrolled into the study. Prevalence stands at 17.5%.

There were 179 (54.4%) males and 150 (45.6%) females. The male to female was ratio 1:1.

From the age groups distribution table all age group were covered but at different prevalence rate of otitis externa. The peak age group was 91 (27.7%) at third decade (21-30). This is illustrated in table 1.

Table I Age group distribution of the patients

Age group	Number	Percentage (%)
1-10	56	17.1
11-20	54	16.3
21-30	91	27.7
31-40	61	18.6
41-50	34	10.3
51-60	22	6.7
≥ 61	11	3.3

Christian religion faith are the majority and accounted for 292 (89.8%). On the occupational status, Students/apprentice and applicant are the major participants and accounted for 109 (33.1%) and 69 (21.0%) respectively. The farmers 54 (16.4%) and housewife 34(10.3%) are the least. On marital status 156(47.4%) single and 94(28.6%) married were the majority. This is illustrated in table 2.

Table II Sociodemographic features of patients

Symptoms	Number	Percentage (%)
Sex		
Male	179	54.4
Female	150	45.6
Religion		
Islam	33	10.0
Christianity	292	88.8
Others	4	1.2
Occupation		
Students/apprentice	109	33.1
Applicant	69	21.0
Housewife	34	10.3
Civil servant	63	19.2
Farming	54	16.4
Maritalstatus		
Single	156	47.4
Married	94	28.6
Widow	32	9.7
Divorced	47	14.3

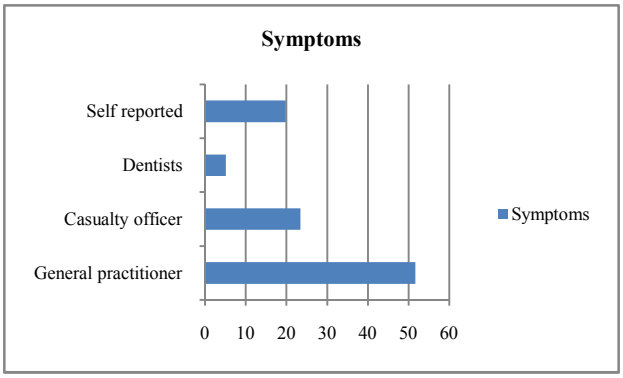

Figure I Sources of referral of otitis external patients

Participants with diagnosis of otitis externa were mainly referred to ear, nose and throat department by the general practitioner and casualty officer as 170(51.7%) and 77(23.4%) respectively. Figure 1 demonstrated this in detailed.

Majority 152 (46.3%) of the participants presented with symptoms of otitis externa within one week of the illness. Presentation at second and third week of illness were 110 (33.4%) and 67 (20.3%) respectively. First episode was noticed in 213 (64.7%) while recurrent episode was noticed in 116 (35.3%).

Earache was the major 286 (87.8%) presenting complaints in this study. Others were 229 (69.6%) ear discharge and 188 (57.1%) hearing loss. This is shown in figure 2.

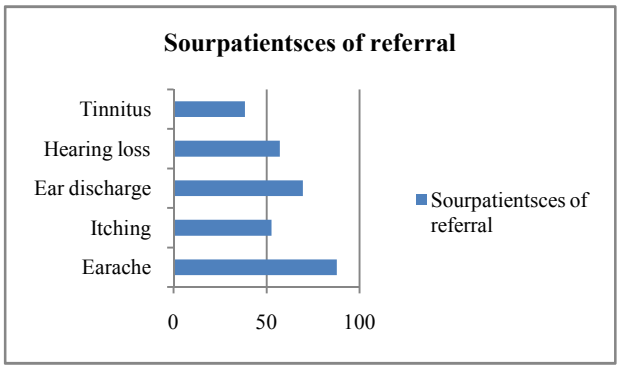

Figure II Presenting complaints of the patients

Common clinical findings in this study were: tragal tenderness 274(83.3%), hyperaemic/edematous ear canal 256 (77.8%) and ear discharge 246 (74.8%). This is demonstrated in table 3.

Table III Clinical signs among the patients

Signs	Number	Percentage (%)
Tragal tenderness	274	83.3
Hyperaemic/edematous ear canal	256	77.8
Scaly debris	82	24.9
Discharge	246	74.8
Ear wax	144	43.8
Stenosed canal	61	18.5
Rashes	42	12.8
Foreign body	23	7.0

Unilateral otitis externa 251 (76.2%) was commoner among the participants than bilateral otitis externa 78 (23.7%). Right ear otitis externa was commoner than left ears otitis externa and were as follows: 170 (51.7%) and 81 (24.6%) respectively. This is illustrated in figure 3.

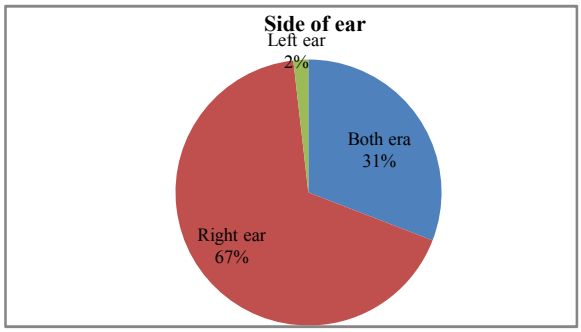

Figure III Side of ear affected by otitis external in the patients

Major type of diagnosed otitis externa in this study were: acute diffuse otitis externa 162 (49.2%) and acute localized otitis externa (furunculosis) 89 (27.1%). Minor type of otitis externa were 4 (1.2%) malignant otitis externa and 2 (0.5%) herpes zoster oticus. This is shown in figure 4.

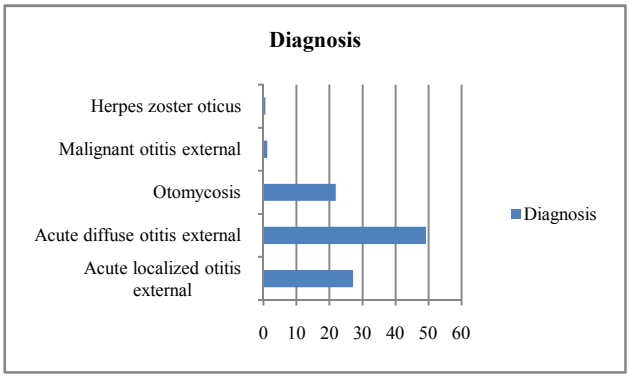

Figure IV Type of otitis externa among the patients

Discharge was noticed in 246 (74.8%) patients. Patients that had ear swab microscopy, culture and sensitivity are minority 127 (38.6%) in number. Ear discharge yield no growth in 21 (6.4%) and growth in 106 (32.2%). The growth of Pseudomonas spp, 12 (3.6%) Klebsiella 18 (5.5%) Staphylococcus aureus 64 (19.5%) and Streptococcus spp 34 (10.3%) were recorded. This is illustrated in table 4.

Table IV Type of offending microorganisms among the patients

Microorganism	Number	Percentage (%)
Nil growth	62	18.8
Staphylococcus aureus	79	24.0
Streptococcus	60	18.2
Pseudomonas aeruginosa	3	0.9
Klebsiella sp	52	15.8
Fungal growth	44	13.4
Others	18	5.5

Otitis externa is associated various kind of ontoward conditions in this work. Common complications were 41 (12.5%) myringitis and 35 (10.6%) auricular cellulitis. Less common complications were 4 (1.3%) osteomyelitis and 4 (1.3%) facial nerve palsy. See table 5 for further illustration.

Table V Complications of otitis externa

Complications	Number	Percentage (%)
Stenosis ear canal	20	6.1
Auricular cellulitis	35	10.6
Facial nerve palsy	4	1.2
Osteomyelitis	4	1.2
Myringitis	41	12.5
Tympanic membrane perforation	32	9.7

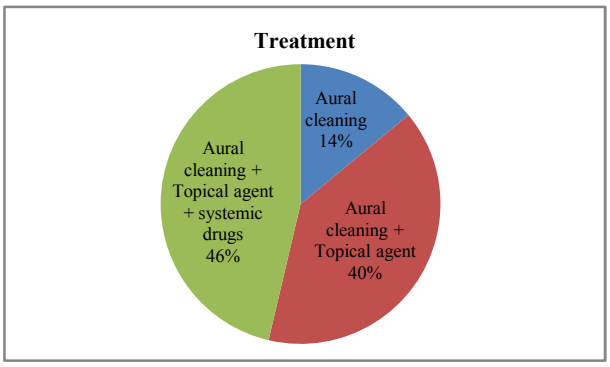

Figure V Treatment of otitis externa

Majority of cases 238 (72.3%) were treated with both topical and systemic drugs, while 91 (27.7%) were treated with topical, systemic drugs and otological procedure. Major procedure were ear syringing and wig dressing in majority of the participants. This is demonstrated in figure 5.

During the follow up period the findings were 121(79.1%) complete symptom resolution by second visit 56 (17.0%) third visit and 14 (4.2%) fourth visits.

DISCUSSION

Otitis Externa is a common otological diseases in otorhinolaryngological, head and neck surgical practice. Prevalence of otitis externa in this study was 17.5%. Otitis externa was a common otological diseases in a study [4]. This findings is different from results recorded in other studies [5]. This high prevalence rate may be due to narrow ear canal, extensive ear wax formation, high humidity in the study area and high level of recurrent otitis externa. In addition to the causes of prevalence otitis externa are trauma to external canal from self-induced objects or cotton bud scratch with subsequent superimpose infection. The practice of ear self cleaning was the most common predisposing factors because during the process of ear cleaning the protective ear wax layer are removed and this leads to infection of external auditory canal [7].

It was noted in this work that prevalence of otitis externa is highest in the third decade (21-30) age groups. The likely reason may be due to higher outdoor activities of this age groups. This also exposes them to excessive heat, humidity, dust and so on. This findings were replicated in other studies [14-17].

Otitis externa was commoner in male than female counterpart in this study. Although this difference is not wide enough while some studies reported significant sex preponderance in their findings. Christian accounted greatest participants with otitis externa in this study. This has nothing to do with the faith. This is a true reflection of the Christian dominated Ekiti state. About 95% of the community are of Christian faith. Students/apprentice including applicants constituted the younger age groups and they accounted for highest proportion of the population with otitis externa. This is not a surprised because younger age groups are found of personal hygiene of the orifices in the head and neck. This findings is similar to findings in other research work [4,5]. Contributions of the marital status cannot be overemphasized in this study as majority of the patients with otitis externa were single. This findings may be due to the greater proportion of the studied population with otitis externa were younger age groups.

Majority of the studied participants presented with otalgia and ear discharge these are due to the acute inflammation of the epithelial coverage and subcutaneous tissue and the exudation from the offending agent [17-19]. The clinical findings of tragal excitation tenderness and hyperaemic/oedematous ear canal were the majority findings and they are due to similar mechanism. Right ear otitis externa was more common than both left and bilateral otitis externa. This is mostly likely due to right ear self cleaning than left ear.

There are different types of otitis externa based on the extent or agent of otitis externa. In this study both acute localized otitis externa and acute diffused otitis externa were the commonest findings. This work findings is similar to findings in other studies [20-22].

Regarding the implicated pathogens microscopy and culture from the ear swab culture, bacterial growth were more than fungal growth while negative results are very few. Some studies confirmed similar growth of fungi and bacteria while others defined fungi as a rare pathogens causing otitis externa [23]. Factors such as humidity and temperate weather most likely played a major role in making fungal infection and bacterial infection to grow. Major isolated bacterial growth in this study were Staphylococcus aureus, Streptococcus sp and Klebsiella. This findings goes with other studies findings [24]. Microscopy, culture and sensitivity test revealed no growth in some specimens and this result is similar to findings in other study [25].

Like any other diseases in the body otitis externa is not exempted from on toward outcomes. The most common complications of otitis externa in this study were myringitis and auricular cellulitis. This is most likely due to poorly or delayed treatment. Virulence or immune status of the patients may also be a contributing factors.

Treatment of otitis externa in this work were divided into three types. The first treatment is meticulous cleaning of the external auditory meatus. If the disease is severe and symptoms such as swelling and pain persist. Then the second line of therapy for otitis externa which is cleaning and topical agent such as steroid based antibiotics is applied. Third mode of treatment is systemic, topical medications and cleaning are prescribed if second line of therapy failed. The systemic oral antibiotics prescribed are mainly active against Staphylococcus aureus, Streptococcus and Pseudomonas aeruginosa which are the most common bacterial pathogens in otitis externa In this study.

CONCLUSION

Otitis externa is a common otological diseases with prevalence of 17.5%. General practitioner are the major first contact and

major sources of referral to the specialist. Timely diagnosis and appropriate treatment would abolish preventable complications seen in this study.

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