



Chronic Suppurative Otitis Media in Nigerian Children: The Port Harcourt Experience

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Authors' contributions

This work was carried out in collaboration between authors LOO and AEO. Author LOO designed the study, wrote the protocol and wrote the first draft of the manuscript. Author AEO managed the literature searches, analyses of the results and wrote the discussion. Both authors read and approved the final manuscript.

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ABSTRACT

Background: The prevalence of chronic suppurative otitis media in children appears to be on the increase in our society probably due to factors associated with poverty and deteriorating healthcare facilities. This study aimed to determine the prevalence of chronic suppurative otitis media as seen in the University of Port Harcourt Teaching Hospital (UPTH), Port Harcourt with a view to documenting the pattern and highlighting the results of management.

Patients and Methods: A retrospective study of all children that presented to the department of E.N.T surgery of UPTH, Port Harcourt, Nigeria with chronic suppurative otitis media over a ten-year period (January 2003-December 2012). The patient's data were retrieved from the clinic registers, patients' case notes and theatre registers. Demographic data, predisposing conditions, aetiological factors, site of tympanic membrane perforation, affected ear, treatment modalities, complications of treatment and outcome of management were recorded and analyzed.

Results: Seven hundred and twenty three patients were found to have CSOM. These accounted for 9.4% of all otorhinolaryngological cases seen within the study period. There were 385 males and 338 females (male: female ratio of 1.1:1.0). Age range was 3 months to 16 years, mean = 8.2 +/- 3.2 years. Age group 1-5 years has the highest (n=344, 47.6%) number of cases. Bilateral CSOM accounted for the highest number (n=350, 48.4%) of cases. Perforation was found more on

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the antero inferior aspect of the tympanic membrane and the commonest etiological factor was poorly treated acute otitis media (AOM). The commonest mode of treatment was conservative medical treatment.

Conclusion: This study confirmed a prevalence of 9.4% of CSOM in children that attended the ENT clinic in UPTH, Port Harcourt. The commonest type seen was the tubo-tympanic disease with antero-inferior tympanic membrane perforation. However, poorly treated AOM was found to be the commonest etiological factor. The provision of adequate health facilities and eradication of poverty possibly will reduce the prevalence of pediatric CSOM in our environment.

Keywords: Chronic suppurative otitis media; conservative medical treatment; tympanic membrane; perforation; otorrhoea.

1. INTRODUCTION

Chronic suppurative otitis media (CSOM) is one of the diseases that commonly present to Ear, Nose and Throat surgeons worldwide and still remains the commonest chronic infection seen in children worldwide [1]. It is defined as a prolonged inflammation of the middle ear cleft characterized by a persistent otorrhoea through a perforated tympanic membrane, lasting more than 6-12 weeks [2]. The duration of otorrhoea regarded as chronic suppuration is under controversy, such that the World Health Organization (WHO) suggests duration of two weeks [2,3]. Its etiology includes trauma, tympanostomy tube placement or poorly treated acute otitis media [4].

There have been attempts to treat this disease condition even in prehistoric era and the treatment modalities kept improving with a greater understanding of the disease entity. Ancient Egyptians used borax and cow milk to treat CSOM [1]. Hippocrates advised that hot water, breast milk or urine should be instilled into the ear while sun, strong wind and smoky rooms should be avoided [1]. For cases he noted as recurrent, he gave an additional powder of lead oxide and lead carbonate to be applied topically [1].

Globally, about 65-330 million people are affected and 60% have significant hearing loss [3]. The bulk of this is disproportionately on children in developing countries [3]. As compared to adults, there is an increased prevalence of CSOM in children aged 1-5years, due to poor Eustachian tube function [5] overcrowding and poverty.

The risk factors for CSOM are multi-factorial. Poor antibiotic therapy, recurrent upper respiratory tract infection, nasal disease, low socio-economic conditions leading to reduced

access to healthcare, Low level of hygiene, poor nutrition and overcrowded living conditions are responsible for an increased risk to otitis media especially in the Sub Saharan Africa [5,6]. Studies have shown that improvement in these social factors of inequalities will reduce the prevalence of chronic suppurative otitis media [7,8].

There are basically two types of CSOM, depending on the site of perforation on the tympanic membrane resulting in either, attic-antral type or tubo-tympanic CSOM respectively [4]. It can also occur with cholesteatoma (epidermal inclusion cyst), as the unsafe or without cholesteatoma as the safe type [5]. This disease is usually initiated by a bout of acute infection, with resultant inflammation of the middle ear cleft. This leads to mucosal oedema and secondary ulceration with eventual breakdown of the epithelial lining. The inflammation occurring within an inclusion cyst makes it expand and erode into bones [5,7]. An attempt to heal leads to the formation of granulation tissue that can manifest as polyps in the middle ear cavity [9]. The continuation of this sequence to involves surrounding structures, lead to the various complications of chronic suppurative otitis media [5] which include meningitis, brain abscess, hearing loss, facial nerve paralysis, carotid artery blowout, sigmoid sinus thrombosis and possibly otitic hydrocephalus. It is a painless condition unless when complicated [3,5,9].

Common organisms isolated from an ear swab microscopy and culture includes *Pseudomonas aeruginosa*, *Staph aureus*, proteus species, *Klebsiella pneumonia* and *Diphtheroids* [6]. Anaerobes and fungi can also be present [7] in other words, it can also be multi-microbial [2]. However, studies have shown that there is little or no role for swab culture in the effective management of this condition [6]. Plain

radiographs of the mastoid and Computerized Tomography scan can be done to know the integrity of the mastoid air cells [4].

Conventional management of this condition is conservative medical treatment, with surgical intervention reserved for cases of unsafe ear and complicated CSOM. Conservative form of management is achieved by aural toileting to reduce debris, antibiotics to control infection, decongestants to reduce mucosal oedema and antihistamines to control allergy. Antibiotics can be topical alone or topical and systemic. As much as aural toilet is a very effective aspect of this conservative treatment, some authorities argue that topical antibiotics alone is good enough, that there is no additional value added by the concomitant use of systemic antibiotics [6,10]. Reason given for this is that due to poor vascularization of the middle ear mucosa, drugs delivered through this route; do not really penetrate the ear [3,6,10]. Surgical interventions usually include tympanoplasty, cortical mastoidectomy or a modified radical mastoidectomy. The end result is usually to achieve a safe, dry ear [10].

A review of existing literature in our environment revealed that there is paucity of information on CSOM especially in children. Therefore, this study aimed to determine the prevalence of CSOM as seen in the University of Port Harcourt Teaching Hospital (UPTH), Port Harcourt with a view to documenting the pattern and highlighting the results of management.

2. PATIENTS AND METHODS

It was a retrospective study which included all the children aged between 0 to 16 years that presented with chronic suppurative otitis media to the department of E.N.T surgery clinic of UPTH, Port Harcourt, Nigeria covering a period of ten years, from January 2003 to December 2012.

The patient's data were collected from the clinic registers, their case files and the hospital theatre registers. Any patient that had a record of otorrhoea due to otitis externa was excluded, also patients aged 18 years and above were excluded. Information taken into consideration included their Demographic data, predisposing conditions, aetiological factors, site of tympanic membrane perforation, affected ear, treatment

modalities, complications of treatment and outcome of management.

Conservative medical treatment employed included the use of ear toileting+ototoxic antibiotics+nasal decongestants; ear toileting+oral antibiotics+ototoxic drugs+nasal decongestants; ear toileting+ototoxic ear drops alone; ear toileting+topical antibiotics sensitive to organisms cultured+nasal decongestants; examination under anaesthesia+aural polypectomy. Results are represented in percentages, frequency tables and bar charts. All statistical analysis was done using the SPSS version 21 software.

3. RESULTS

Seven hundred and twenty three patients were found to have CSOM. These accounted for 9.4% of all otorhinolaryngological cases seen within the study period. There were 385 males and 338 females, which puts the male to female ratio as 1.1:1.0. Age of patients identified to have CSOM ranged from 3 months to 16 years, with the mean age being 8.2 ± 3.2 years. The Age group 1-5 years had the highest (n=344, 47.6%) number of cases (Table 1). Patients with bilateral CSOM made up the highest number (n=350, 48.4%) of cases (Table 2). Tympanic membrane Perforation was found more on the antero-inferior aspect of the tympanic membrane (Table 3) and was indicated to be central. The commonest etiological factor was poorly treated acute otitis media (Table 4). Conservative medical treatment was offered most of the patients, (Table 5) and considerable success was achieved, evidenced by the achievement of dry ear in about 62% of the patients. The predominant type of CSOM was the tubo-tympanic type, with central perforation and absence of cholesteatoma. About 8 patients had aural polyps and 4 patients had mastoiditis. There was no mortality in our series.

4. DISCUSSIONS

Our study showed that the prevalence of CSOM among children in Port Harcourt is 9.4%. In 1985, Okeowo reported a prevalence of 0.6% in urban Lagos and 3.6% in rural school children in Lagos [11]. However in 2002, Lasisi et al. [12] noted that 20% of ENT visits by children in University College Hospital, Ibadan, were for chronically discharging ears.

Table 1. Showing patient age range

Age range (years)	Number	Percentage (%)
3months-1 year	77	10.6
1-5	344	47.6
6-10	157	21.7
11-16	145	20.1
Total	723	100

Table 2. Showing side of ear affected

Side of ear affected	Number of patients	Percentage %
Bilateral cases	350	48.4
Left ear	220	30.4
Right ear	153	21.2
Total	723	100

Table 3. Showing types of tympanic membrane perforation

Types of perforation	Number of patients	Percentage %
Antero-inferior aspect of TM	505	69.8
Marginal	32	4.4
Postero-superior aspect	12	1.7
Total	75	10.4
Subtotal	99	13.7
Total	723	100

Table 4. Showing aetiological factors of CSOM

Trauma following the use of cotton bud to clean ear	34	4.7%
Trauma from foreign bodies insertion	87	12.0%
Poorly treated Acute Otitis Media	305	42.1%
Not documented	297	41.1%
Total	723	100%

Table 5. Showing treatment modalities

Ear toileting+use of ototopic antibiotics+nasal decongestants	276	38.17%
Ear toileting+oral antibiotics, ototopic drugs+nasal decongestants	350	48.41%
Ear toileting+topical antibiotics sensitive to organisms cultured+nasal decongestants	58	8.02%
Ear toileting+ototopic ear drops alone	31	4.29%
Examination Under Anaesthesia+Aural Polypectomy	8	1.11%
Total	723	100%

The increase in the prevalence can be attributed to the apparently increased number of presentations to the ENT clinics. However, it can also be due to the growing degree of poverty among the low socio-economic class in our environment which is worsened by high cost of transportation to the tertiary hospital, leading to poor access to expert management. This factor combined with exorbitant hospital bills [12,13] results in late or no presentation to ENT clinics, or eventually to poor treatment of acute otitis media by the General Practitioners.

Furthermore, this can explain the placement of Nigeria on W.H.O. profile, as one of the nations with high CSOM prevalence [3,9,11] alongside countries like Angola, Vietnam and Mozambique [3].

The male to female ratio was 1.1:1.0, which shows a slight male preponderance. similar to hospital-based studies in Maiduguri by Zaria et al. [14]. Kodiya et al. in Kaduna [15] and Oyeka et al. in Enugu [16]. This is similar to the rural finding in the study done by Ologe and Nwawolo,

in [17]. Several studies have shown that CSOM possibly has equal gender incidence in distribution [3,5,8,10,11,13].

The mean age in this study was 8.2 ± 3.2 years and the age group 1-5 years had the highest number of cases (Table 1). Ologe and Nwawolo [17] also noted that children under five years had the highest number of cases in their series. This is the age group most vulnerable to CSOM because the anatomical disposition of the Eustachian tube at this age makes them prone to poor aeration of the middle ear with an increased risk to middle ear infections [3-5].

In this study, bilateral disease had the highest occurrence being 48.4% of all cases, with slight left ear predominance (Table 2), similar to the findings of Ezeanolue et al. [18], where up to 60% had bilateral disease and also noted slight left ear predominance. On the contrary, Ologe and Nwawolo in [17] had bilateral disease in only 16.8% with right and left ear equally affected. Tiedt et al. [7], recorded 31.4% of bilateral disease with slight right side majority. Nnebe-Agumadu et al. [19] in Ebonyi State University Teaching Hospital, observed 83% unilateral disease in children. This shows that CSOM has no predilection for any particular ear [7-9].

The tubo tympanic type of CSOM predominated in this study, similar to findings by Ibekwe & Oghenekaro in [20]. Studies by Salisu in Kano [21] and Okafor in Enugu [22] showed comparable findings. This goes to show why there were relatively reduced cases of complicated CSOM in our environment as compared to the high prevalence of the disease. A Study carried out by Adhikari in Kathmandu valley, Nepal also imply that tubo-tympanic disease is associated with less complications [1,3,5-8,23].

5. CONCLUSION

This study confirmed a prevalence of 9.4% of CSOM in children that attended the ENT clinic in UPTH, Port Harcourt. The commonest type seen was the tubo-tympanic disease with antero-inferior tympanic membrane perforation. Poorly treated Acute Otitis Media was found to be the commonest etiological factor. Furthermore, conservative medical treatment (aural toileting, the use of either ototopic antibiotics or systemic antibiotics coupled with nasal decongestants) was found to be the commonest mode of treatment.

However, increased awareness campaign for early detection of ear diseases and its complications are essential to curb this disease besides, the provision of affordable and more accessible healthcare facilities especially to the rural populace [24].

CONSENT

Patient consent not applicable: The study was a retrospective study.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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