

# A Survey of the Burden of Management of Chronic Suppurative Otitis Media in a Developing Country

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## Abstract

**Background:** Although the prevalence of chronic suppurative otitis media (CSOM) is much higher in developing countries, most surgical treatment techniques are not easily accessible in many poor resource countries. **Aim:** The survey aims to examine the extent to which health care facilities in Nigeria are equipped to address the management challenges of CSOM. **Subjects and Methods:** Online questionnaires were sent and received from otolaryngologists practicing in across Nigerian public health institutions to evaluate the institutional practice concerning management of CSOM. Information enquired include: Proportion of CSOM among the ear, nose and throat (ENT) patient load, routinely applied treatments and challenges facing availability of standard treatment options. Data were analyzed with Statistical Package for the Social Sciences version 15 (Chicago Illinois, USA), and presented descriptively. **Results:** Responses were returned from 17 otolaryngologists (68% [17/25]) practicing in institutions across the six geopolitical zones with a mean duration of otolaryngology services of 22.4 (14.8) years. The CSOM patients constitute an average of 25.3% (13.1) of ENT patient load, with an average of 31 (15.3) % having significant hearing loss. Surgery have never been tried in 41% (7/17) of the institutions due to lack of facilities and/or expertise. Among institutions that offer surgery, 40% (4/10) offer only cortical mastoidectomy and only 30% (3/10) offer type I tympanoplasty. Achievements of permanent dry ears were reported more in institutions that offer surgery. Unaffordable cost of hearing aid and lack of expertise for tympanoplasty are the major challenging factors for rehabilitation of CSOM induced hearing loss. **Conclusion:** Considering the enormity of CSOM in Nigeria, and the fact that > 40% (7/17) of the public health institutions still lack facilities and/or expertise for surgical treatments for CSOM, public otolaryngological centers should not only be adequately equipped for tympanomastoid surgeries, attention should be focused on further training of experts in the operative techniques from within and outside the country.

**Keywords:** Chronic suppurative otitis media, Ear discharge, Hearing aids, Hearing loss, Mastoidectomy, Tympanoplasty

## Introduction

Chronic suppurative otitis media (CSOM) is a leading cause of mild to moderate conductive acquired hearing loss worldwide, especially in children, and particularly in developing countries.<sup>[1-7]</sup> It is characterized by long-standing ear discharge through a persistent perforation of the tympanic

membrane.<sup>[7-10]</sup> CSOM is believed to develop in early childhood, often following poorly managed acute otitis media, with potential of spilling over into adulthood, accounting for recurrent episodes of chronic discharging ears that can last for many years.<sup>[2,7-9]</sup>

Although CSOM is a major health problem in many indigenous populations around the world, its impacts are often more pronounced in developing countries despite the advances in medicare recorded in the surgical management of CSOM globally.<sup>[2,5-7,11-13]</sup>

Risk factors that have been attributed to the high rates of CSOM in these populations are: overcrowding, poor hygiene, poor nutrition, high rates of nasopharyngeal colonization with

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potentially pathogenic bacteria and inadequate and unavailable health care.<sup>[7,8,13-15]</sup> Often the commonly reported organisms responsible for most cases of CSOM include *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Klebsiella pneumonia*, *Escherichia coli*, and anaerobes.<sup>[3,5,7,8]</sup>

Most approaches to surgical treatment have been unsatisfactory or are very expensive, or techniques are not accessible in many poor resource countries. These issues are of concern to health workers throughout the world. The purpose of the present survey is to examine the extent to which public health care facilities in Nigeria are equipped to address the management challenges of CSOM among her populace.

## Subjects and Methods

This is a prospective study carried out over a period of 5 months ending April 2012, in which otolaryngologists filled out online survey questionnaires to evaluate the availability and adequacy of material and human resources for the management of CSOM in Nigerian public health care facilities. Questionnaires were sent out to E-mail addresses of specialist otolaryngologists practicing in public health institutions across the six geopolitical zones of Nigeria. The institutions were targeted to include the 18 institutions that were accredited (full and partial) by the West African College of Surgeons for postgraduate otolaryngology training in Nigeria. Reminders were sent after 1 week of no response. Following 3 weeks of non-response from the addressees, fresh questionnaires were sent to other otolaryngologist in the same respective institutions. Responses were also returned electronically to the E-mail address of the author. Trainee otolaryngologists were excluded from participating in the survey.

The questionnaire ensured anonymity of the respondents and their institutions and were also pretested for validity and reliability.

After ethical approval and informed verbal consent data on the following information were collected: Age of the institution as well as duration of its otolaryngology services, number of employed full-time otolaryngologists, data on residency training for otolaryngology; average proportion of CSOM patients to the overall ear, nose and throat (ENT) patient load, percentage of children as well as hearing loss among the CSOM patients, frequency of cholesteatoma, routinely available and preferred treatment options. Medical treatment refers to all non-surgical treatment option and included antibiotics/antifungal therapy, ear toileting, decongestants, whereas, the surgical treatments enquired, ranged from simple cortical to more complex radical mastoidectomies, and reconstruction of hearing by tympanoplasty surgeries. Also, the reasons, outcomes and limitations of the preferred options, challenges facing availability of standard treatment options as well as hearing rehabilitation, were evaluated.

Data were analyzed with Statistical Package for the Social Sciences version 15, Chicago Illinois, USA and presented descriptively.

## Results

The questionnaires were delivered to a total of otolaryngologists practicing in 25 public health institutions across the six geopolitical zones of the country. Responses were returned from 17 (68% [17/25]) otolaryngologists representing their respective institutions. Seven (41% [7/17]) of the institutions were major federal teaching hospitals which have been rendering otolaryngology services for up to 30 years [Table 1]. The duration of otolaryngology services among the institutions ranged from 3 to 54 years, mean of 22.4 (14.8) years. The number of otolaryngologists engaged in each institution range from 1 to 6, with a mean of four otolaryngologists per institution. The average number of patient turn-out in the ENT clinics among the institutions ranged from 10 to 80/clinic day with a mean of 38 (19). Of this number, the mean proportion of CSOM per clinic day is 25.3 (13.1)%. Significant hearing loss was estimated averagely in 31% (15.3) of the CSOM patients.

Medical treatment is the only treatment option adopted for CSOM patients in 41% (7/17) of the institutions. The major reason offered for adopting only non-surgical treatment option was the unavailability of necessary surgical instruments in 86% (6/7) of the respondents, whereas lack of expertise for operative technique of mastoid and middle ear surgeries was additionally the reason in 57% (4/7) of the respondents. In one institution, it was acclaimed that non-surgical treatment almost always resulted in achieving permanent dry ear. Among the institutions where surgical options are routinely carried out for CSOM, 40% (4/10) can only offer cortical mastoidectomy due mainly to lack of necessary expertise for other forms of tympano-mastoidectomy [Table 1]. The only form of tympanoplasty that three centers can offer at the moment is type 1.

Social embarrassment from recurrent ear discharges was acknowledged by 88% (15/17) of the respondents as the major concern of CSOM patients, whereas hearing impairment on account of CSOM was recognized by 71% (12/17) of the respondents as a major concern of patients.

Concerning ear discharges, 35% (6/17) of the respondents acknowledged that dry ears are achieved in most patients mainly on a temporary basis [Table 2]. Eighty percent of the respondents that reported achieving permanent dry ears in some of their patients were related to institutions that are able to offer surgical treatment options to their patients.

Table 3 outlines the various options adopted by the different institutions in addressing the hearing deficit of the CSOM patient. Most respondents (87% [15/17]) acknowledge the application of hearing aids in their institutions, whereas

**Table 1: Class of the health institutions in relation to the treatment modalities adopted for CSOM**

Treatment modalities adopted	Class of the institutions				Total
	Major federal teaching hospitals	Younger federal teaching hospitals	FMC	State federal teaching hospitals	
Conservative medical treatment only	1	0	4	2	7
Combined medical and surgical treatment					
Cortical mastoidectomy only	2	2	0	0	4
Modified/radical mastoidectomy	2	1	0	0	3
Mastoidectomy/tympanoplasty (only type 1)	2	1	0	0	3
Total	7	4	4	2	17

CSOM: Chronic suppurative otitis media, FCM: Federal medical centers. n=17 respondents

**Table 2: Adopted treatment option for CSOM in relation to the outcome of ear discharge**

Treatment option	Dry ears achieved				Total
	Permanently in most patients	Permanently in few patients	Temporarily in most patients	Never achieved	
Only conservative medical treatment	1	1	4	1	7
Combined surgical and medical treatment	3	5	2	0	10

CSOM: Chronic suppurative otitis media

**Table 3: Management options for addressing hearing deficit from CSOM among the 17 health institutions**

Options	Respondents	Percentage
Control of ear discharge alone	3	18
Use of hearing aids	13	76
Tympanoplasty	3	18

CSOM: Chronic suppurative otitis media

**Table 4: Reported challenges to the management of hearing deficits from CSOM**

Factors	Respondents	Percentage
Unaffordable cost of hearing aids	13	76
Non-availability of hearing aids	9	53
Social unacceptability of hearing aid	7	41
Lack of tympanoplasty expertise	10	59
Patients' ignorance	4	24

CSOM: Chronic suppurative otitis media

tympanoplasty is applied in only 18% (3/17) of the institutions. The major challenges to hearing rehabilitation of CSOM patients were displayed in Table 4, with unaffordable cost of hearing aid and lack of expertise for tympanoplasty as the most prominent factors.

## Discussion

CSOM is commoner in developing countries, with its prevalence being reported as high as 11%,<sup>[8,13,15]</sup> whereas it is a vanishing disease in more developed part of the world where incidence is less than 2%.<sup>[8,14,16]</sup> In the developing countries still, poverty, ignorance, dearth of specialists and limited access to medical care amongst others conspire to worsen the course and complications (sometimes life-threatening) of CSOM.<sup>[13]</sup>

Randomized clinical trials comparing medical and surgical intervention are not available. Hence, the treatment of CSOM

is almost exclusively based on empirical experience.<sup>[17]</sup> Most otolaryngologists often adopt conservative medical treatment as the first line approach, with surgery as a secondary option when conservative treatment fails. Ear discharge from CSOM is often recalcitrant to management and prone to recurrences and occasionally, with life-threatening complications; hence it is recommended that all cases of CSOM be referred to otorhinolaryngologists for prompt management.<sup>[13,16-20]</sup> The otorhinolaryngologist will add little or is unlikely to add to patient's improvement if the expertise and facilities are not there at his/her disposal.<sup>[19,20]</sup>

In the present survey, social embarrassment from frequent ear discharges as well as hearing loss were identified by 88% (15/17) and 71% (12/17) of the respondents respectively as the major concerns of CSOM patients. But permanent dry ears were acknowledged in only 18% (3/17) of the patients which were more likely if surgeries were combined with medical treatments. Despite poorer results acknowledged in the control of ear discharges, more than 40% (7/17) of the institutions continued to adopt medical treatments as their only treatment option for CSOM. The major reasons for this adopted practice being the lack of facilities and expertise for tympanomastoid operations. These challenges were similarly identified as factors militating against the improvement of medicare of CSOM in developing countries.<sup>[13,16,18,19]</sup>

There are few reports in the literature of tympanomastoid surgeries being carried out in Nigeria for CSOM,<sup>[17,18]</sup> but are in agreement with results of this survey in recognizing that relatively lack of expertise and facilities for the tympanomastoid operation are identifiable challenges to the management outcome of CSOM in Nigeria. This invariably means limited or poor exposure of trainee otorhinolaryngologist to tympanoplasty/mastoid surgery in the country.<sup>[18]</sup> Also the range of tympanomastoid surgeries being carried out among

the institutions in this survey at the moment, seem inadequate for the surgical demand of the relatively teeming population of CSOM patient (23% of clinic attendance). It was observed that cortical mastoidectomy constitutes the major tympanomastoid surgery. In the case of tympanoplasty, only type 1 is carried out among the institutions in this present survey. This implies that more complex tympanomastoid surgeries for CSOM may not be in practice in Nigeria. There is therefore urgent need to focus attention towards the training of trainee otolaryngologists as well as retraining of otolaryngologist in the techniques of tympanomastoid surgery in institutions where these techniques are available both within and outside the country.

This survey also identified unaffordability of hearing aids (76% [13/17]) followed by lack of tympanoplasty expertise as the major challenges in the management of hearing deficit in CSOM patients. Disabling hearing impairment has been identified as a major health problem in patients with CSOM particularly in poor resource countries where CSOM is a recognized course of hearing impairment.<sup>[1-7,20,21]</sup> Although some degree of hearing improvement can be achieved via tympanoplasty, hearing aid may become a valuable option, if for any reason surgery cannot be carried out in a CSOM patient. Reports indicated that the production of hearing aids meets less than 10% of global need. In developing countries, fewer than 1 out of 40 people who need a hearing aid have one.<sup>[22]</sup>

## Conclusion

Lack of expertise and facilities constitute a major problem in rehabilitation of CSOM patients. Training trainee resident doctors and retraining of otolaryngologist in techniques of tympanomastoid surgery should be vigorously pursued from such centers within and outside the country.

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