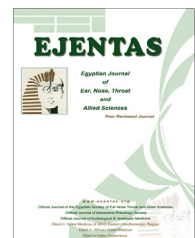




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ORIGINAL ARTICLE

Socioeconomic challenges of chronic suppurative otitis media management in state tertiary health facility in Nigeria

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Abstract Chronic suppurative otitis media (CSOM) is a serious health care concern worldwide due to its substantial financial and non-financial burden. The aim was to determine the socio-economic challenges of CSOM in developing economy.

Methods: It is a nine month prospective study of all patients with a diagnosis of CSOM seen at Kogi State Specialist Hospital in north-central Nigeria. A semi-structured questionnaire was used to collect relevant information from patients/caregiver after an informed consent and ethical clearance obtained from relevant authorities. Information retrieved included socio-demographic data, site and duration of discharge, the financial cost of various stages of treatment and follow up.

Result: Eighty-two new patients were seen during the study period aged 2–56 years with a mean age was 8.84 years, male:female ratio of 2.2:1. About 84.1% of the patients were from within the town. The average cost of consultation per visit was 150 NGN (US\$1.00). The recorded cost of out-patient medical management with basic investigation was about 14,550.00 NGN (US\$97) while those requiring rehabilitation was 85,100 NGN (US\$567.3). The average cost of medication and

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ear dressing was 2475.00 \pm 82.6 NGN (US\$17) and 750 NGN (US\$5) respectively. None was operated.

Conclusion: The socioeconomic cost of CSOM is still very high both financially and non-financially. Children are at the receiving end, there is a need for capacity building to reduce the cost burden and out of pocket expenses through health insurance scheme will go a long way.

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1. Introduction

Otitis media is a generic term¹ and includes the acute otitis media (AOM) and chronic otitis media (COM) and Otitis media with effusion (OME), also referred to as non-suppurative otitis media.² COM equates with the classic term chronic 'suppurative' otitis media that is no longer advocated as COM is not necessarily a result of 'the gathering of pus'. However, the distinction remains between *active* COM, where there is inflammation and the production of pus, and *inactive* COM, where this is not the case though there is the potential for the ear to become active at some time.²

Active COM or CSOM can also be defined as a disease condition of non-healing perforation of the tympanic membrane associated with chronic inflammatory changes of the mucoperiosteum of the middle ear cleft with or without mucoid or mucopurulent otorrhea of more than 3 months duration.¹⁻³ The World Health Organization (WHO) definition requires only 2 weeks of otorrhea⁴, but most otolaryngologists including the authors of this manuscript tend to adopt a longer duration of about 3 months of active disease.⁵

A third clinical entity is *healed* COM where there are permanent abnormalities of the pars tensa, but the ear does not have the propensity to become active because the pars tensa is intact and there are no significant retractions of the pars tensa or flaccida.²

CSOM is a serious healthcare concern worldwide, not only because of the distress it causes to the patient and their family but also because of the substantial economic burden quantifiable and unquantifiable, financial and non financial losses in productivity.⁶ And reduced quality of life which it imposes on the affected individuals.⁶ The chronic otitis media is a phenomenon virtually non-existent in the developed world, however it still constitutes a major public health problem in Africa, Asia and Latin America⁷ Nigeria inclusive. It is commoner among children belonging to rural children and lower socioeconomic group^{4,5} where poverty, overcrowding, illiteracy, poor living conditions, ignorance, poor hygiene, malnutrition and lack of medical facilities, frequent upper respiratory tract infections, low socioeconomic status have been suggested as a basis for the widespread prevalence of CSOM.⁸ A prevalence rate of 7.3% was reported among school children enrolled in nursery, primary and secondary schools in a rural community in Kwara State, Nigeria.^{6,7} There is a close correlation between patients with active chronic otitis media, hearing loss and socioeconomic group with the lower socioeconomic group having a higher incidence.⁴

The poorer rural communities have the highest prevalence⁹ and this has been associated with problems of inaccessibility to and affordability of health care.⁷⁻¹⁰

The aims of managing the chronic discharging ear are early detection and timely, appropriate intervention to eradicate the disease permanently or to reduce its effects such as ear discharge, hearing loss and other complications, if eradication is not possible.⁶ This can be solved by regular aural toileting, antibiotic treatment, middle ear reconstruction and the use of hearing aids for rehabilitation. In sub-Saharan Africa, this will seem to be an arduous task due to poverty and the task of prioritizing health care needs in the face of limited and diminishing resources.¹¹

The direct and indirect costs of otitis media in the United States (US) were estimated to exceed US\$3.5 billion about a decade ago¹² however no data is available in Nigeria hence the rationale for this study.

The present study was aimed to determine the prevalence of CSOM and its association with certain socioeconomic factors and the burden of its management in Nigeria.

2. Methodology

It was a prospective cross sectional study of all consecutive patients with a clinical diagnosis of chronic suppurative otitis media attending the Ear, Nose and Throat (ENT) clinic of the Kogi State Specialist Hospital, located in Lokoja, North-central Nigeria. It is an 80-bed tertiary-care health facility, one of two such hospitals serving the needs of about four million people both within and outside the state. It is a tertiary care but serves primary and secondary healthcare function because the institutions responsible for these levels of health care in the state in question do not have the required training, personnel and equipments to care for these patients. The study population included new patients seen in the ENT unit of the hospital with a diagnosis of CSOM over a 10 months period. All new patients with chronic middle ear discharge and persistent tympanic membrane perforation for 12 weeks and above were recruited into the study. All patients were managed conservatively as none of the patients could afford the cost of surgical treatment. Excluded from the study are those patients with aural polyps or masses, bleeding middle ear, patients with previous ear surgery and patients already on ear dressing with antibiotics. A semi-structured questionnaire was administered to each patient/caregiver after an informed consent had been obtained. Information retrieved from the participants include their bio-data (age, sex, occupation), type of clinical presentation, site and duration of discharge, the financial cost of consultation, number of visits, hearing assessment test, cost of radiological and laboratory investigation and cost of oral and topical medication. Other variables assessed are the cost of aural dressing, number of follow ups and estimated non-financial cost such as quality of life, hearing loss, other type of complications seen and the social impact on individuals.

The hospital price list for all health care services provided including drugs, dressing and consultation was used to deduce the direct financial costs. The cost per patient's visits was also calculated and the mean cost was calculated. Patients were followed up throughout the study period until there is improvement in disease condition and hearing which is the outcome measure. All the patients could have benefitted from one form of tympanoplasty however none could afford the cost. All these information were entered into SPSS version 17.0 statistical package and analyzed descriptively and results presented in tables and figures.

3. Results

Eighty-two patients with chronic suppurative otitis media were seen during the study period age range 2–56 yrs with a mean age of 8.84 yrs ($SD = 10.3 \pm 1.1$). CSOM accounted for 40% (205) of otology presentations and 37% of all ENT diseases seen during the study period. There were 56 (68.3%) males and 26 (31.7%) females with a male:female ratio of 2.2:1. Children under the age of five years accounted for about 47.6% of the patients seen (Fig. 1). There were 40 (48.8%) students who comprise of secondary school students (14.6%) and primary school pupils (34.2%), 2 (2.4%) unskilled workers, 6 (7.3%) unemployed individuals and 1 (1.2%) belongs to the class I of the socioeconomic group using the educational status and occupation. Thirty-three (40.2%) were children and unemployed. The duration of symptoms ranged from 3 months to 24 months with a mean duration of 7.7 months (Fig. 2). About 84.1% of the patients were from within the town where the health facility is located while 15.9% were from outside the facility area. Out of the remaining participants, 11% came to the facility from a distance of about 70–100 km radius while 4.9% were from outside the state, a distance of above 200 km with an average transportation cost of 200–300 NGN (US\$1.5–2).

Otoscopy revealed unilateral CSOM in 51 (62.2%) out of which 34 (41.5%) were found on the right side and 31 (37.8%) were bilateral chronic middle ear discharge with tympanic membrane perforation. The number of clinic visits after diagnosis ranged from 2 to 6 with a mean clinic visit of 3.2. The average cost of consultation per visit was 150 NGN

(US\$1.00). Twelve patients (14.6%) attended clinic only once and did not come for subsequent follow up (Table 1).

Out of the 82 patients only 19 (23.2%) had X-rays of the mastoid series done with estimated cost between 1500 and 3000 NGN and a mean cost of 1578.95 NGN (US\$10.5). Thirty-eight patients (46.3%) with otorrhea had ear swabs taken for microscopy, culture and sensitivity (MCS) with a mean cost of 1500 NGN (US\$10).

Hearing assessment test with pure tone audiometry was available at a distance of about 200 km at a cost of about 1200NGN (US\$8.00) however only 10 (12.2%) of the patients could afford it, using a clinical audiometer Damplex AS 67 equipped with well fitting standard head phones (TDH39) at an average cost of 5000 NGN (US\$33.3). The equipment was calibrated with sound level meter (Testo 815) initially and periodically to ensure accuracy of measurement. Twenty-nine (31.7%) patients could not afford the cost of hearing assessment test while 43 (56.1%) did not give any response to the reason why the hearing test was not done.

The conservative management of patients involved; keeping ear dry, regular aural toileting and alternate daily ear wick dressings with steroid containing quinolone antibiotics for a minimum of 2 weeks and a maximum of 4 weeks and the use of oral decongestants and antibiotics. All the patients with otorrhea had oral medication prescribed for them which included quinolones antibiotics, decongestant and multivitamins with cost ranging from 1900 to 4500 NGN (US\$13–30) with a mean cost of 2475.00 ± 82.6 NGN (US\$17). The average cost of aural toileting and dressing per patient was between 750 NGN (US\$5) for unilateral otorrhea and 1500 NGN (US\$10) for bilateral conditions with a mean cost of 750 ± 19.7 NGN. The average number of clinic follow up visits was 3.3 per patient, with about 40.2% of the respondent having about 4 follow up visits, 35.4% having 3 follow up visits, 19.5% having 2 clinic follow up visits and 4.9% having 5 clinic follow up visits. The recorded financial cost of initial outpatient medical management with basic investigation of patient with CSOM was about 14,550 NGN (US\$97). However those requiring hearing aids for rehabilitation after the disease have been controlled had significantly higher costs of 85,100 NGN (US\$567.3). Hearing test was carried out in double walled sound proof booth and single frequency threshold values were obtained at 125, 250, 500, 1000, 2000, 3000, 4000 and 8000 Hz in accordance with the established procedure.¹³ In the case of bone conduction, a vibrator placed on the corresponding mastoid bone was used in place of ear phones and frequency evaluated were 250, 500, 1000, 2000 and 4000 Hz. The result revealed moderate pure conductive hearing loss in 3 (30%) patients, moderate mixed hearing loss with high conductive component in 5 (50%) patients and mixed hearing loss with high sensorineural hearing loss component in 2 (20%).

Twenty-nine (35.4%) out of the 82 patients will require surgical intervention for closure of the tympanic membrane perforation after microscopic reassessment of the middle ear but could not afford.

Only two (2.4%) of the patients could afford hearing aid from which they benefitted. None of the patients reported the loss of their job or any sanctions because of the illness, two (2.4%) of the pupils were reported by their caregiver to suffer poor academic performance from poor hearing.

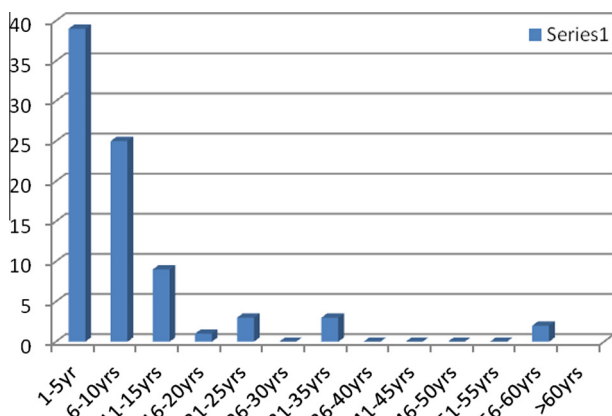


Figure 1 Age-Frequency distribution chart.

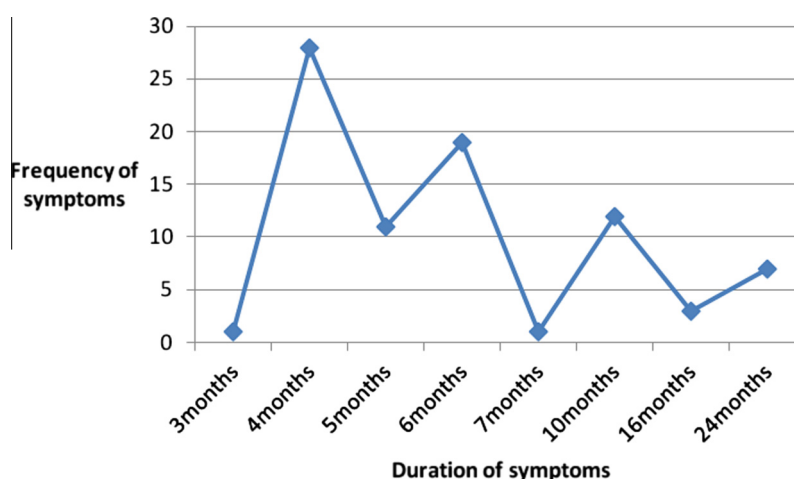


Figure 2 Duration of symptoms-Frequency chart for the CSOM.

Table 1 Clinic visit-Frequency.

| Number of clinic visits | Frequency (%) |
|-------------------------|---------------|
| 1 | 12 (14.6) |
| 2 | 26 (31.7) |
| 3 | 29 (35.4) |
| 4 | 12 (14.6) |
| 6 | 03 (3.7) |
| Total | 82 (100) |

4. Discussion

Nigeria is the most populous country in Africa and indeed in the black nation of the world with a population of 140 million people, based on the 2006 National Population Census and 163 million based on National Population Commission's estimates.¹⁴ Despite the fact that Nigerian economy is paradoxically growing, the proportion of Nigerians living in poverty is increasing every year. The proportion of the population living below the poverty line increased significantly from 1980 to 2010 using the Harmonized Nigeria Living Standard Survey 2009/2010.¹⁴ The scourge of poverty goes beyond mere measurement of a household's expenditure or welfare. Poverty has many dimensions and may include inadequate access to government utilities and services such as our health facility that is located in the state capital, environmental issues, poor infrastructure, illiteracy and ignorance, poor health, insecurity, social and political exclusion some of which were not evaluated in this study. In urban areas, the burden of demand of services has effects on school enrollment, access to primary health care, and growth of unsanitary urban slums. Also in rural areas, poverty manifests itself more in the agricultural sector and food security.¹⁴ For any meaningful economic growth and poverty reduction, there is the need to enhance and improve access to social services, including health which is the basis of our research. Kogi state is one of the states in the North-Central zone with negative income inequalities of about 15.7% with an average of US\$67.3 per day based on an adjusted poverty profile.¹⁴

Otitis media (OM) is one of the most common childhood infections, the leading cause of doctors' visits by children in ENT clinic.¹⁵ This finding was also confirmed in our study where almost half of the respondents were children under the age of five years. It is the most common diagnosis made by otolaryngologists among children in Nigeria.¹⁶ The study also showed that males are more affected than females, similar to previous reports.¹⁰ It is an incidence that has been reported to depend on race and socio-economic factors² and studies have shown in particular recurrent and chronic forms, associated with high economic and societal costs¹⁷ as majority were either children or students who have no means of income. Only one patient in our study was in the socioeconomic class I,¹⁸ a finding that is similar to results of studies from developed and developing countries.^{10,19–23}

The duration of symptoms before presentation was found to have an average of 7.7 months; this was late as it can be extrapolated to be due to either poor awareness about the treatment of ENT diseases, non availability or financial problems however none of this was deduced from the study. However in this study we used the 3-month limit for chronic suppurative otitis media although some authors have used 2 weeks as the reference for selecting OM and CSOM, similar to studies.^{20–23}

Despite the fact that some of the study participants reside close to the health care facility, late presentation was still a common problem observed among the participants due to finances. This could be responsible to an extent for the patronage of alternative medical practitioners²⁴ or use of self medication as documented in the previous study from this center²⁵ which may be harmful to the patients although not covered in this study. Another problem is the distance to the health facility^{13,25}; almost one-fifth of them have to travel a distance of > 70 km to access health care at an average cost of about US\$1.5–2. This is expensive for a developing country like Nigeria^{26,27} where the daily income is less than US\$2.00 per day^{13,26–28} and presents the patient and their families a very big dilemma; either to take care of their everyday daily needs such as food and clothing or spend the available meager resources on their health. There is a need for capacity building, especially at the level of the primary health care in the area of

basic ENT care where adequately trained, skilled community health workers, nurses and doctors are available²⁹ to do the basic ear care. The WHO Primary Ear and Hearing Care Training Resource are helping in this regard³⁰ but the need to intensify this effort in Nigeria is needed to reduce the burden of this disease. This intervention will help in reducing the burden and severity of CSOM through early presentation and reduce the cost of treatment especially as it relates to the travelled distance by the patients.

The clinic visits vary from 2 to 6 with an average of 3.2 visits. Although the cost of transportation for each participant was not evaluated in this study, it could be contributory most especially as some have to travel a far distance to assess the facility thus discouraging multiple visits.^{13,26} Economic cost was found to affect the patient's investigation as only 23.2% had X-ray and only 10 (12.2%) could afford the hearing assessment.

Reducing the burden of hearing loss is a worthwhile goal even as attempts are made to prevent CSOM. All the patients in this study had various types of hearing impairment from clinical assessment, a significant cause of non financial disability affecting their quality of life. However financial difficulty made it impossible for majority of them to do hearing assessment tests, this disability was the reason for the poor performance loss in academics in two of our patients, a cost which is unquantifiable for each individual and their various families.^{13,23}

Audiological rehabilitation and hearing amplification through the provision of hearing aids for effective communication strategies are an alternative for those who desire hearing rehabilitation after the ear is dry. These include standard hearing aids and bone conductors; however the high costs of hearing aids (the least cost in Nigeria being about 50,000 NGN i.e. US\$333.3) in an environment where the minimum wage per month is 6500 NGN (US\$43.3).

5. Conclusion

The socioeconomic cost of chronic suppurative otitis media (CSOM) is still very high both financially and non-financially for the study despite the fact that CSOM is a common disease. There is a need for capacity building to reduce the burden of cost of chronic as well as the associated risk. This if done at the level of the primary health care especially in the area of basic ENT care, will encourage early presentation and appropriate management. Reducing out of pocket expenses by patients through the introduction of some form of health insurance in the community as against what is being practiced now which is limited to only federal workers is another intervention worth exploring. Provision of the basic amenity in ENT practice at a secondary care level like ours will minimize the cost and encourage presentation of patients.

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