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CHRONIC SUPPURATIVE OTITIS MEDIA IN SCHOOL PUPILS IN NIGERIA
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F.E. OLOGE and C.C. NWAWOLO

ABSTRACT

Objective: **To compare the prevalence of chronic supperative otitis media (CSOM) among two populations of school children.**
Design: **A survey-demographic data collection and otoscopy was carried out among the two populations of school children.**
Setting: **A rural government primary school and an urban private primary school**
Subjects: **Six hundred and ninety nine school pupils in the rural school and two hundred and seventy pupils in the urban school.**
Results: **Six per cent of the pupils in the rural schools had CSOM as evidenced by persistent perforation of tympanic membrane of more than three months duration. No tympanic membrane perforations were observed in the children in the urban school at the time of this study. The difference in the prevalence of CSOM between the two populations is statistically significant (P<0.001). The difference in socio-economic status between the two populations is statistically significant in relation to the prevalence of CSOM in the two populations. The poorer rural population had a significantly higher prevalence of CSOM (P<0.001).**
Conclusion: **The two study populations are just seven kilometres apart geographically but there is a world of difference in their socio-economic status, availability of social infrastructure and health facilities. This presumably had reflected in the marked difference in the prevalence of CSOM between the two study populations. A collective effort of government and well meaning indigenes of rural communities in Nigeria can help promote the socio-economic status and enhance the availability of social infrastructure and health facilities of rural areas. This we hope will lead to a decline in the prevalence of CSOM in the rural areas.**

INTRODUCTION

Chronic suppurative otitis media (CSOM) is one of the most common diseases of the ear, particularly in childhood(1-3). Its incidence has been reported to depend on race and socio- economic factors(4). A high prevalence has been reported among the Eskimos, American Indians, Australian aboriginal children and among black South Africans(4).

Poor living conditions, overcrowding, poor hygiene and nutrition have been suggested as a basis for the widespread prevalence of CSOM in developing countries(4,5). A similarly high prevalence has been reported among poor Caucasians and American Indians in Kentucky(6).

In the developing countries, there is differential prevalence among the different socio-economic strata of the community. Okafor found that the majority of the patients with chronic ear disease came from poor communities living in subsistence agricultural or slum areas of the cities(2). His records show that most of the children with CSOM came from the low income group; the bottom rung in the society. There were only a few cases where CSOM affected patients from the higher socio-economic ladder and even then the pathology started before the patient moved up the socio-economic ladder(2). The only exceptions to this finding were a few children born in good circumstances but with special problems such as cleft palate(2). His study was hospital based.

Researchers agree that a combination of a poor, unsupportive, unstimulating background and a hearing defect almost guarantees that a child will not attain his full academic potential(7). Unfortunately, the two factors very often co-exist.

In a survey of Nigerian school children aged 6-15 years, a higher rate of tympanic membrane perforations (evidence of CSOM) was found among rural children than in urban children(8). The ratio was 4:1. Our study sought to compare the prevalence of CSOM among two populations of school children in a rural government primary school and an urban private primary school. The aim was to re-echo the plight of less privileged school children, who have to compete, from a disadvantaged

platform with peers who are better favoured. These children, already disadvantaged in terms of infrastructure, teaching aids and manpower, also run a higher risk of hearing impairment consequent upon increased prevalence of CSOM among them(9).

MATERIALS AND METHODS

The study was carried out among pupils of a private primary school in Ilorin; and pupils of a public primary school in Ganmo, Kwara State. Ganmo is a village located 7km from Ilorin, the capital city of Kwara State of Nigeria.

The pupils in the private primary school in Ilorin are predominantly children of relatively high-income earners in an urban setting. The pupils in the public primary school in Ganmo are predominantely children of farmers and petty traders in a rural setting.

Demographic data collection and otoscopy was performed on the study populations. In both Ganmo and Ilorin, information was obtained from the pupils, their teachers and parents and filled into a questionnaire.

A battery (dry cell) operated auroscope was used to examine the ears. Where applicable, ear discharge was mopped dry; aural wax was evacuated where possible using Jobson Horne's probe. Persistent perforation of the tympanic membrane, with or without otorrhoea of more than three months' duration was taken as evidence of CSOM(10).

RESULTS

Six hundred and ninety nine pupils in Ganmo provided adequate information and had otoscopy performed on them; with clear view of the tympanic membrane. They were found to be aged 8-15 years old. Three hundred and thirty four (47.8%) were males and 365(52.2%) were females.

In Ilorin, pupils aged 8-12 years were found in classes 4-6 and so they were the target population. Two hundred and seventy of them were enrolled in the study. One hundred and fifty two (56.3%) were males and 118(43.7%) were females.

Table 1 shows the determinants of socio-economic status found among the pupils studied. Majority of the fathers and mothers of the children in the urban school had at least secondary education (92.2% and 83.3% respectively).

On the other hand, only 24.8% of the fathers and 15.6% of the mothers of children in the rural school had at least secondary education. While 12.2% of the parents of pupils in the urban school had five or more children; 70.1% of parents of pupils in the rural school had five or more children. Thus overcrowding is more likely among the children in the rural school than those in the urban school.

Figure 1 shows that 42(6%) of the children in Ganmo primary school had CSOM as evidenced by perforation of the tympanic membrane, with or without otorhoea. None of the pupils in the urban school had evidence of CSOM. The difference in the prevalence was statistically significant($P<0.001$).

Table 1

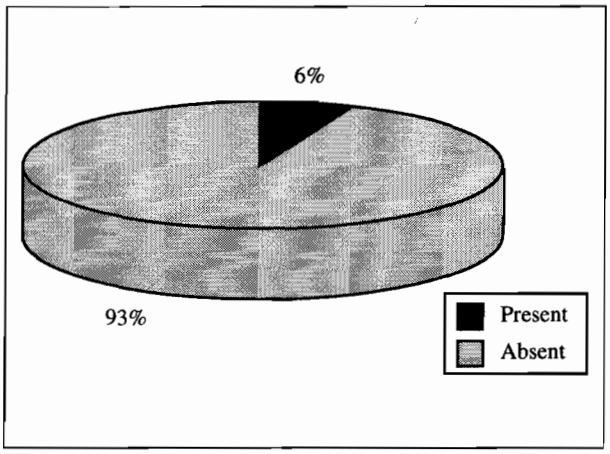
Determinants of Socio-economic status

Parameter	Frequency (%)		P-value
	Ilorin (n=270) Urban	Ganmo (n=699) Rural	
Father's education			
Primary or less	21 (7.8)	526 (75.2)	0.00000
Secondary	56 (20.7)	130 (18.6)	
Tertiary	193 (71.5)	43 (6.2)	
Mother's education			
Primary or less	45 (16.7)	590 (84.4)	0.00000
Secondary	87 (32.2)	71 (10.2)	
Tertiary	138 (51.1)	38 (5.4)	
Father's occupation			
*Business	68 (25.2)	574 (84.4)	0.00000
Civil servant	125 (46.3)	123 (17.6)	
Professional	77 (28.5)	2 (0.3)	
Mother's occupation			
Housewife	27 (10)	29 (4.2)	0.00001
*Business	84 (31.1)	642 (91.8)	
Civil servant	122 (45.2)	27 (3.9)	
Professional	37 (13.7)	1 (0.1)	
Number of sibs			
One	21 (7.8)	8 (1.2)	0.00001
Two	68 (25.2)	24 (3.4	
Three	86 (31.9)	59 (8.5)	
Four	62 (22.9)	118 (16.9)	
Five or more	33 (12.2)	490 (70.1)	

*Business includes farming, trading, craft-work etc.

Figure 1

Prevalence of CSOM among primary school children in Ganmo



Among the 42 pupils with CSOM in Ganmo 20 (47.6%) were males and 22 (52.4%) were females. Only one (2.4%) had an attic perforation. Others had safe or tubo- tympanic CSOM. The right (51%) and left (49%) ears were equally affected. Only seven (16.7%) had bilateral disease.

Table 2 shows the socio-economic parameters of pupils with chronic suppurative otitis media.

In majority of children in the rural school (73.8%) with CSOM, their fathers had primary or no education at all. Also in 81% of children with CSOM, their mothers had primary or no education at all. Similarly 64.3% of the pupils with CSOM came from homes with five or more siblings.

Eight (19%) of the pupils with CSOM had active disease during the period of the study; and 81% had inactive disease (Table 3).

Table 2

Parameters in children with CSOM

Parameter	Ganmo		P-value
	With CSOM (%) (n=42)	Without CSOM (%) N=657	
Father's education			
Primary or less	31 (73.8)	495 (75.3)	0.956689
Secondary	8 (19)	122 (18.6)	
Tertiary	3 (7.2)	40 (6.1)	
Mother's education			0.653665
Primary or less	34 (80.9)	556 (84.6)	
Secondary	6 (14.3)	65 (9.9)	
Tertiary	2 (4.8)	36 (5.5)	
Father's occupation			-
*Business	33 (78.6)	541 (82.3)	
Civil servant	9 (21.4)	114 (17.4)	
Professional	-(0.0)	2 (0.3)	
Mother's occupation			-
Housewife	5 (11.9)	24 (3.6)	
*Business	36 (85.7)	606 (92.2)	
Civil servant	1 (2.4)	26 (4.0)	
Professional	-(0.0)	1 (0.2)	
Number of sibs			-
One	2 (4.8)	6 (0.9)	
Two	3 (7.1)	21 (3.2)	
Three	3 (7.1)	56 (8.5)	
Four	7 (16.7)	11 (16.9)	
Five or more	27 (64.3)	463 (70.5)	

*Business includes farming, trading, craft work etc

Table 3

Active and inactive CSOM

	Ganmo (Rural)	Ilorin (Urban)
Active CSOM	8(19%)	0
Inactive CSOM	34(81%)	0
Total	42(100)	0

DISCUSSION

The two study populations are just 7km apart geographically but there is a world of difference in their socio-economic status, availability of social infrastructures and health facilities. This presumably had reflected in the marked difference in the prevalence of CSOM between the two study populations($P<0.001$). CSOM was only one fourth as prevalent in the urban Eskimo children as in the rural Eskimo children ($P<0.0005$) (9). Similar results were observed by Oduntan in Nigeria(8). Okeowo observed a statistically significant difference in the prevalence of CSOM among rural school children (3.6%) and urban school children (0.6%) (11). Hoborow *et al.* two decades ago, found a much higher incidence of middle ear abnormality including CSOM in Ilorin than Ibadan(12). This they thought could be as a result of a more rural environment.

Educational status and occupation are main determinants of socio- economic status. The parents of children in the rural school have significantly poorer education and occupations when compared with the parents of the children in the urban private school. The rural populations low income had to spread sparsely over a significantly increased family size. Thus malnutrition and poor living conditions are more highly likely among the children in the rural school. Also over crowding is more likely in the rural community because of a significantly higher number of siblings in an environment where houses are generally smaller and less spacious than the urban centres.

Poor housing and overcrowding predispose to recurrent upper respiratory tract infection and hence may contribute to chronic middle ear infection. The vast majority of infecting organisms reach the middle ear by way of the eustachian tube in both children and adults, most commonly from an ordinary head cold(13).

Pipe-borne water and modern sanitary facilities are unavailable in Ganmo. At the time of the study there was only one Government Health centre manned intermittently by a non-resident doctor on short term attachment (a Youth Corper). Even this health centre is very poorly patronized as the population prefer the services of chemists and traditional medicine men. Only 10% of patients with CSOM had reported to the hospital for treatment. This again is a reflection of the educational level and health awareness of this rural community. Poverty is another reason for the lack of patronage of the health center. In this kind of setup, acute suppurative otitis media rapidly progressed to a chronic disease. Adequate and appropriate antibiotics could have aborted and ensured resolution of the acute disease.

Chronic suppurative otitis media is a recognised cause of mild to moderate hearing loss(12). In general, the hearing loss associated with CSOM is conductive and tends to increase with posterior location and increasing size of the tympanic membrane perforation. The level of hearing loss is within 0-45 dB if there is no associated ossicular destruction or sensorineural component(1). Complete destruction of the ossicular chain and tympanic membrane usually produces a hearing loss of 50-60 dB. Rao and Jayakar found CSOM to be the single major cause for conductive deafness in India, being present in 66.3% of cases(14,15). In Kenya, Uganda and Jamaica, 12-15% of deafness had been reported to be due to otitis media(12,16-18).

Potential loss of hearing as a result of otitis media has important consequences on the development of speech and cognitive abilities, including academic performance of children(5,19). Thus the gap between the fortunate and the less privileged is further widened by an innate difficulty in learning occasioned by CSOM.

A collective effort of government and well-meaning indigenes of rural communities in Nigeria can help promote the socio-economic status and enhance the availability of social infrastructures and health facilities of rural areas. This we hope will lead to a decline in the prevalence of CSOM in the rural areas.

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