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The prevalence and correlates of self-reported hearing impairment in the Ibadan Study of Ageing

Akeem O. Lasisi[a,*], Taiwo Abiona[b], Oye Gureje[b]

[a] Department of Otorhinolaryngology, College of Medicine, University of Ibadan, Ibadan, Oyo State, Nigeria
[b] Department of Psychiatry, College of Medicine, University of Ibadan, Ibadan, Oyo State, Nigeria

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ABSTRACT

This cohort study of 1302 persons aged ≥65 years, conducted in the Yoruba-speaking regions of Nigeria, determines the prevalence and correlates of hearing impairment (HI) in the elderly population. Self-reports of HI and its putative risk factors among several indices were obtained using face-to-face interviews, and confirmed by observer's evaluation. Hearing impairment was found in 79 respondents, giving a prevalence of 6.1%. Gender difference was not significant but increasing age was associated with higher prevalence. Logistic regression analysis, adjusted for age and sex, revealed that history of recurrent suppurative otitis media [odds ratio (OR) = 4.6, 95% CI 2.34–8.99, $P = 0.01$], head injury (OR = 2.2, 95% CI 1.14–4.26, $P = 0.02$) and current hypertension (OR = 2.1, 95% CI 1.18–3.57, $P = 0.01$) were significantly associated with HI. No identifiable risk factors were found in 32 (40.5%) of the 79 respondents with HI. We conclude that the prevalence of HI among the elderly in Nigeria is comparable to reports from other countries. Identified risk factors were preventable or controllable. The large proportion of elderly with no identifiable risk factors, presumably presbyacusis, suggests a need for further study. The strategies for control of these risk factors and hearing aid support should be integrated into health care policy initiatives for elderly persons in sub-Saharan Africa.

1. Introduction

Hearing impairment (HI) is the most common sensory deficit among older adults and its effects can be socially and psychologically devastating, leading to loneliness, isolation, anxiety and depression, and associated with other sensory impairment.[1,2] The projected global rise in the proportion of persons aged ≥65 years is likely to be associated with increasing prevalence of HI among the elderly.[3,4]

The control of risk factors offers the prospect of stemming the rise in the prevalence of HI. Studies from developed countries have documented age, noise, head trauma and chronic medical illnesses as significant risk factors for HI.[3,5,6] Risk factors may be different in developing countries. For example, in view of large sections of the population residing in rural areas in developing countries, noise may be a less important factor. On the other hand, poor access to medical services may mean that medical conditions that could otherwise be promptly treated may become chronic and therefore predispose to HI. For example, poorly controlled hypertension or diabetes may predispose to HI through the occurrence of chronic arteriosclerosis which in turn causes a reduction in the blood supply to the inner ear.[4–6] It is also plausible to speculate that the presence of chronic recurrent rhinosinusitis and chronic ear discharge will predispose to HI in the elderly.

Even though the majority of elderly persons in the world reside in developing countries and the proportion of the elderly population in these developing countries is

* Corresponding author. Present address: P.O. Box 22040, University of Ibadan, Ibadan, Nigeria.
E-mail address: akeemlasisi@gmail.com (A.O. Lasisi).

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projected to rise even further, there has been little study of the major causes of disability among them. Specifically, there is a paucity of studies addressing the prevalence and correlates of HI in the elderly in these countries with a consequent gap in our knowledge about effective strategies to prevent the problem.[5,6] In this report, we present the results of an epidemiologic study of hearing loss in a community sample of elderly persons. The report examines the prevalence and putative risk factors associated with hearing loss in the elderly.

2. Methods

2.1. Sampling

The Ibadan Study of Ageing is a longitudinal cohort study of the mental and physical health status as well as the functioning and disability of elderly persons (aged ≥65 years) residing in the Yoruba-speaking areas of Nigeria, which consists of eight contiguous states in the southwestern and northcentral regions (Lagos, Ogun, Osun, Oyo, Ondo, Ekiti, Kogi and Kwara). The population of these states is approximately 25 million people, which is about 22% of the Nigerian population. The baseline survey was conducted between November 2003 and August 2004 and the methodology has been described in full elsewhere;[7,8] only a brief summary is provided here. Respondents were selected using a multistage stratified area probability sampling of households. In households with more than one eligible person (aged ≥65 years and fluent in Yoruba, the language of the study), the Kish table selection method was used to select one respondent.

2.2. Data collection

Face-to face interviews were carried out at baseline in 2003 on 2152 respondents who provided consent to participate, representing a response rate of 74.2%.

An annual three-wave follow-up of the cohort was begun in 2007. Of the baseline sample, 1413 were alive in 2007. This cohort was enlarged by the addition of 461 new respondents, thus resulting in a total of 1874. A second-wave assessment was conducted in 2008. A total of 1474 persons (78.7%) were successfully interviewed in 2008. Those who could not be interviewed consisted of 112 (6.0%) who had died, 275 (14.7%) who had relocated or could not be found after repeated visits (a maximum of 5 visits were made) and 13 (0.7%) who refused to be interviewed. Of the 1474 persons who were successfully interviewed, 1302 provided complete information about hearing and the correlates examined in this report.

The interviews were done by 24 trained interviewers, all of whom had at least 12 years (high school) education. Many interviewers had previously done field surveys and had experience of face-to-face interviews. Interviewers undertook two weeks of training, consisting of an initial 6-day training given by one of the authors (OG) (which included item-by-item description of questionnaires and role play), followed by a further two days of debriefing and review after every interviewer had done two practice interviews in the field. Six supervisors, all of whom were university graduates and had survey experience, underwent the same level of training and monitored the day-to-day implementation of the survey.

2.3. Measures

Along with several other assessments, a checklist of chronic physical and pain conditions was included in the Ibadan Study of Ageing.[9] At the 2008 follow-up respondents were asked if they had been told by a physician that they had diabetes or hypertension. The Rose Angina Questionnaire[10] was used to assess presence of angina. Questions were asked about hearing-related problems. Specifically, respondents were asked: if they had (a) 'difficulty hearing clearly'; (b) 'recurrent pus discharge from the ear in the past'; (c) 'recurrent nasal congestion and rhinorrhoea' and (d) 'any previous head injury'. Respondents were required to give a yes or no answer to each of these questions. The diagnoses of recurrent suppurative otitis media and recurrent rhinosinusitis were made based on positive response to questions 'b' and 'c' respectively. At the end of assessment, lasting an average of one hour, interviewers completed a set of questions reflecting their observation during the interview. One of the items was whether difficulty of hearing had been noted during the interview. In this report, only persons with reported hearing difficulty that was complemented by interviewer observation were regarded as having HI.

2.4. Data analysis

We present the unweighted estimates of the occurrence of HI. Univariate analysis was used to determine the significance of the differences in the occurrence of the demographic and clinical variables between the subjects with and without HI. Associations with socioeconomic variables and comorbid conditions were explored using logistic regression and the results are presented as odds ratios (ORs) with 95% confidence intervals. Economic status was assessed by taking an inventory of household and personal items such as chairs, clocks, buckets, radios, television sets, fans, stoves or cookers, cars and telephones; the list was composed of 21 such items. This is a standard and validated method of estimating economic wealth of elderly persons in low income settings.[7] Respondents' economic status is categorized by relating each respondent's total possessions to the median number of possessions of the entire sample. Thus, economic status is rated low if its ratio to the median is 0.5 or less, low-average if the ratio is 0.5–1.0, high-average if it is 1.0–2.0, and high if it is over 2.0. Residence was classified as rural (less than 12 000 households), semi-urban (12 000–20 000 households) or urban (greater than 20 000 households). The odds for the occurrence of variables were determined with multivariate analysis. The clinical correlates were explored with logistic regression analysis after adjusting for age[11] and the estimates of standard errors of the ORs obtained were made with Stata version 7.0 (Stata Corp., College Station, TX, USA). All of the confidence intervals reported are at 95% and are adjusted for design effects. In order to take account of the sample design, we used the jackknife