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DETERMINATION OF PREVALENCE, RISK FACTORS AND PATTERNS OF HEARING LOSS AMONG THE ELDERLY WITH HYPERTENSION IN IBADAN, OYO STATE, NIGERIA

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Abstract

Reduced hearing sensitivity among the elderly has been attributed to some risk factors and influence of age-related degenerative conditions such as diabetes, cardiovascular disease, Alzheimer's disease, bipolar disorder and hypertension. Hearing loss, especially the age-related type (presbycusis), has been reported as one of the global burdens affecting the general well-being and quality of life of the elderly with hypertension. Thus, hearing loss has been observed to be associated with hypertension and functional decline in elderly, as this condition makes them experience poor communication, fatigue, reduced social functions, mood -swing and withdrawal syndrome. Emerging research outcomes indicate a strong relationship between hypertension and reduced auditory performance among the elderly. Therefore, this study determined the prevalence, types and patterns of hearing loss associated with hypertension, in a bid to suggest comprehensive management strategies and a model of creating awareness towards promoting good healthy living among the elderly in Nigeria. One hundred and seventy two elderly, aged 65 – 85 with hypertension were purposively selected from patients undergoing treatment for hypertension in some tertiary hospitals in Ibadan, Nigeria for the study. Participants were subjected to Pure-Tone Audiometry (PTA) through the use of Maico 53 Diagnostic Audiometer to determine the degrees, types and patterns of hearing loss among the elderly with hypertension. Results showed that 148 (86.05%) elderly patients with hypertension presented with different degrees, types and patterns of hearing loss. Out of this number, 123 (83.1%) presented with bilateral hearing loss, while 25 (16.89%) had unilateral hearing loss. Degree of hearing loss, 74 moderate hearing loss, 118 moderately severe and 50 severe hearing loss. 36% of the hearing loss appeared as flat audiometric configuration, 24% were slopping, 19.0 % were rising, while 21% were tough-shaped audiometric configurations. The findings showed high prevalence of hearing loss among the elderly with hypertension in Ibadan, Nigeria. Based on the findings, management of the elderly with hypertension should include regular audiological rehabilitation and total adherence to hearing conservation principles, otological management, regulation of blood pressure and adequate counselling and follow-up services.

Key words: Ageing, Reduced auditory performance, Elderly with hypertension, Hearing loss, Hypertension.

Introduction

Ageing is a kind of irreversible biological change that occurs in all living things with the passage of time, eventually resulting in death. Ageing is an important stage of all human societies. It reflects the biological changes as well as cultural and societal conventions. Some dimensions of ageing grow and expand over time, while others decline. In recent years, there has been an increasing awareness of health issues relating to ageing populations. Traditional perceptions of old age have been challenged during the past few years and it is important that elderly people are not taken as a burden on society, but rather as an asset (Szucs, 2001). The health problems of the elderly are complicated by social, economic and psychological interactions to a greater degree than younger people. Moreover, these problems are usually multiple, and are often masked by cognitive and sensory impairments such as hearing loss.

Hearing loss is part of global disease burden that, irrespective of age, affects the quality of life of the people, which appears gradually, and may make the reception of speech sounds difficult (Marchiori, Filho and Matsuo, 2006). Normal conversations use frequencies of 500 to 3,000 Hz at 45 to 60 dB, but after 60 years of age, hearing typically declines gradually annually. For many years, hearing loss in older adults has been perceived as an unfortunate but inconsequential part of ageing, because it is a slow, insidious process, and many people do not realize how bad their hearing has become until they get a hearing test. Several studies have confirmed that hearing loss starts at about 30 years old and that hearing loss is prevalent among the elderly population (Maltby, 2007). This increases progressively along the years and about 2 percent of adults aged 45 to 54 have been observed having hearing loss. The rate increases to 8.5 percent for adults aged 55 to 64 and nearly 25 percent of those aged 65 to 74 and 50 percent of those who are 75 and older have hearing loss. More than 90 percent of older persons with hearing loss have age-related sensorineural hearing loss, which is a gradual, symmetric loss of hearing (predominantly of high frequencies) that is worse in noisy environments (Yueh, Shapiro, MacLean and Shekelle, 2003).

Age-related hearing loss is a highly complex process. It involves a multitude of intrinsic and extrinsic factors, and these factors may include genetic composition and metabolic reactions in the body system. The metabolic changes, such as systemic arterial hypertension (SAH) present in adults may be empowered by the presence of hearing loss or vice-versa. Toscano-Barbosa (2000) stated that hearing changes may derive from systemic arterial hypertension, and a few diseases are responsible for such frequent complications such as cardiac, renal and peripheral vascular insufficiency (Toscano-Barbosa, 2000). Hypertension among the elderly population, according to the Seventh Report of the Joint National Committee on prevention, detection, evaluation, and

treatment of high blood pressure, is regarded as a systolic and/or a diastolic blood pressure measurement consistently higher than an accepted normal value. Normal blood pressure at rest is within the range of 100–140mmHg systolic (top reading) and 60–90mmHg diastolic (bottom reading). High blood pressure is said to be present if it is often at or above 140/90 mmHg. In almost all contemporary societies, blood pressure rises with ageing and the risk of becoming hypertensive later in life is considerable (Vasan, Beiser, Seshadri, Larson, Kannel, D'Agostino and Levy, 2002). Thus, it is pertinent to report that hypertension is one of the risk factors for the acquisition of hearing loss by the elderly, because hypertension is one of the major risk factors of peripheral arterial disease (Emdin, Anderson and Callender, 2015).

Globally, it has been estimated that premature deaths resulting from hypertension annually are approximately 7.1 million, which account for 64 million disability-adjusted life years (DALYs) (Witworth, 2003). Hypertension as a disease ranks third, after underweight and unsafe sex, in the list of six major risk factors contributing to the global disease burden warranting some form of treatment (Witworth, 2003). In Nigeria, according to The National Expert Committee on Non-Communicable Disease (1992), a report of a national survey on population studies have put the prevalence of hypertension at about 25% in the adult population in Nigeria and the percentage continued to increase. *Hypertension* is common, and associated with numerous diseases. Several studies have suggested a correlation between *hearing loss* and *high blood pressure* and *vice versa* (Elise, Kempen, Kruize, Boshuizen, Ameling, Staatsen and de Hollander, 2002; Marchiori, Rego Filho, and Matsuo, 2006; Nagaoka, Marcelo, Takata, Renan, Flavia and Penido, 2010). *However, the association between hypertension and hearing loss remains unclear (Umesewa, Sairenchi, Haruyama and Nagao, 2019), but some cross-sectional studies have reported a positive association between hypertension and hearing loss in Korea and Indian workers in the Iron and Steel Industries (Hong, Jeon, Ku, et al., 2015). Also some other studies have shown a high correlation between hypertension and noise exposure, others have shown no correlation. Some have suggested that noise exposure may increase stress and blood pressure and others have suggested that the tendency toward hypertension is associated with greater risk of hearing impairment (Elise, et al., 2002; Narlawar, Surjuse and Tharke, 2006). Further, Talbott, Matthews, Kuller, Cottington and Redmond (1978) have suggested that noise-induced hearing loss may be a marker of hypertension in older noise-exposed population. Sataloff and Sataloff (2006) explained that some conditions such as hyperlipoproteinemia are associated with increased risks of both hypertension and hearing loss with or without noise exposure. However, the effects of the drug cannot be totally neglected, as poorer hearing levels might be anticipated during*

the ageing process and possibly as a result of the continued long duration of drug usage due to persistent hypertension. Therefore, the continuous investigation of the audiometric configurations and its patterns among the elderly with hypertension are pertinent as it would help to detect damage to the hearing organ and help initiate informed decision to curtail the menace of hearing loss among the older generation.

Most of the reports on hearing impairment in adults were from studies done in Europe and America while few studies have been done on hearing impairment among black population (Ogah, 2014). Though, hearing loss has been observed on having impact on the quality of life of the affected hypertensive individuals, as well as the changes of cochlear activity that occur due to the disease, not much data is available on the risk factors associated with purely hearing loss among adults and elderly with hypertension in Nigeria. *In addition*, Nagaoka, Marcelo, Takata, Renan, Flavia and Penido (2010) stated that idiopathic sudden sensorineural hearing loss co-occurring with hypertension, diabetes mellitus or dyslipidemias, in older patients, is associated with a higher prevalence of cerebral microangiopathy, revealed by magnetic resonance imaging, and associated with a slower hearing recovering, showed by later improvements in speech discrimination tests. To buttress this point, Duck, Prazma, Bennett and Pillsbury (1997) submitted that, hypertension appeared to increase the hearing thresholds among diabetic subjects, though there is still limited body of research showing significant relationship between hypertension and hearing loss among the elderly.

Ologe, Segun-Busari, Abdulraheem and Afolabi (2003) tried to determine the pattern of ear diseases among elderly Nigerians, so as to provide an objective basis for cost-effective health care planning for the emerging geriatric population. A retrospective study of 320 patients aged 60 years or older presenting with ear diseases at the University of Ilorin Teaching Hospital, Ilorin, Nigeria, between January 1996 and December 2001 was carried out. The researchers reported that impacted cerumen was the most common ear disease, occurring in 110 (34.4%) patients of the study population. Chronic suppurative otitis media (CSOM) was the most common infectious disease, affecting 28 (8.8%) patients. Their results further showed that, of the 88 patients with hearing loss, 63 (71.6%) had sensorineural, 20 (22.7%) had presbycusis, 1 (1.1%) had conductive, and 4 (4.6%) had mixed hearing losses. Based on the data, the researcher suggested that impacted cerumen, hearing loss, and infections, are the common ear diseases among elderly Nigerians.

Lasisi, Abiona and Gureje (2010) had a longitudinal cohort study to determine the prevalence and correlates of tinnitus among community elderly people and its impact on their quality of life in Yoruba-speaking communities in Nigeria. A face-to-face interview of 1302 subjects of 65 years or older were

selected by the use of a multistage stratified sampling of households. Participants were assessed for subjective tinnitus, chronic health conditions, functional impairment, and quality of life by use of the brief version of the World Health Organization quality of life instrument. By the end of the research, Lasisi et al. (2010) reported tinnitus in 184 (110 female and 74 male subjects), giving a prevalence of 14.1 percent (SE = 0.49). Gender, age, economic status, educational level, residence, smoking, and alcohol consumption were not significantly associated with tinnitus.

Investigating the possible relation of presbycusis to cardiovascular disease (CVD), Gates, Cobb, D'Agostino and Wolf (1993) assessed the hearing status of a group of 1662 elderly men and women which was determined and compared with their 30-year prevalence of cardiovascular disease. Age-adjusted multivariate logistic regression was used to calculate odd ratios (ORs) and 95% confidence intervals (95% CIs) to describe the relation of hearing to cardiovascular disease events, cardiovascular disease risk factors, and both events and risk factors separately for the 676 men and for the 996 women. Five groups of risk factors were studied: hypertension and blood pressure; diabetes, glucose intolerance, and blood glucose level; smoking status and number of pack-years of cigarettes; relative weight; and serum lipid levels, including cholesterol, triglycerides, and lipoprotein fractions.

Gates et al. (1993) records that low-frequency hearing (using low pure-tone average, 0.25 to 1.0 kHz) was related to cardiovascular disease events in both genders but more in the women. For women, the OR of having any cardiovascular disease event for a low pure-tone average of 40 dB hearing level was 3.06 (95% CI, 1.84 to 5.10); for a high pure-tone average (average of 4 to 8 kHz) of 40-dB hearing level, the OR for any cardiovascular disease event was 1.75 (95% CI, 1.28 to 2.40). In men with a low pure tone average of 40-dB hearing level the OR for stroke was 3.46 (95% CI, 1.60 to 7.45) and for coronary heart disease the OR was 1.68 (95% CI, 1.10 to 2.57). In the women, a low pure-tone average of 40 dB hearing level was associated with an OR for coronary heart disease of 2.14 (95% CI, 1.21 to 3.79) and for intermittent claudication the OR was 4.39 (95% CI, 2.02 to 9.55). The researchers also note that of the risk factors, hypertension and systolic blood pressure were related to hearing thresholds in both men and women, and blood glucose level was related to low pure-tone average in the women and there was a small but statistically significant association of cardiovascular disease and hearing status in the elderly that is greater for women than men and more in the low than the high frequencies.

Duck et al. (1997) examined diabetic end-organ damage of the cochlea in relation to hypertension. The purpose of the study was to support the hypothesis that diabetic end-organ damage of the cochlea is augmented in the setting of

hypertension. Previous studies carried out implicated diabetes and hypertension as risk factors in the development of sensorineural hearing loss, as well as study the basic scientific and medical cause of the diseases and the disturbance of the renal and vascular effects of diabetes and hypertension was presented. Both humans and animals were observed in the study and the results of audiologic findings in insulin-dependent diabetic patients, both normotensive and hypertensive, were analysed and correlated with the results of animal studies to support the hypothesis that sensorineural hearing loss in patients and cochlear hair cell loss in animal studies result from the effects of hypertension in conjunction with insulin-dependent diabetes mellitus. Unfortunately, few studies have investigated the pattern of hearing loss amongst the elderly patients receiving treatment for hypertension, despite the fact that a large population of the elderly are been affected in Nigeria. Consequently, the potential appropriate identification and intervention are lacking for the hypertensive patient. Hence, hearing loss became an additional stress, along with reduced capacity and poor health, to the hypertensive individual. These have led to the decline in sensory abilities and their negative effects on older individuals' daily life adjustment, physical and psychosocial functioning which had been widely discussed. Therefore, this study investigated the prevalence, risk factors and patterns of hearing loss among the elderly with hypertension in Ibadan metropolis, Nigeria.

Methodology

The study adopted the descriptive research design of the *expost-facto* type. This research design was adopted because the researcher does not have direct control over the variables, as it has already occurred. 127 elderly patients, aged 65 years and above with hypertension in Adeoyo Hospital, Ibadan, Oyo State, Nigeria were purposively sampled. The study engaged the use of an otoscope and the audiometer (MAICO 53) to measure the threshold of hearing of the respondents for pure tones with which an audiogramme was plotted to ascertain the pattern and degree of hearing loss among the patients. The study also adapted the PAHO/WHO Multinational Survey Questionnaire of Risk Factors for Non-Communicable Diseases. The questionnaire comprises two sections: A and B. Section A is made up of the participants' personal data, while section B consisted of 41 items that measured various risk factors of hearing loss among the elderly individuals. Section B was further sub-divided into six (6) sections for clarity and better understanding of each question item.

Ethical approval was obtained from the University of Ibadan/University College Hospital (UI/UCH) Ethics Committee, and the permission was sought from the Head of Department of Special Education before embarking on the study. Further, the researchers personally met with each of the participants to ascertain the readiness to participate in the study and to explain procedures.

Hence, an informed consent form was given to the selected participants and/or caregivers for approval. After the approval was granted by the participants/caregivers, data collection took place immediately during clinic days in sessions at the clinic. However, patients who chose otherwise were excluded from the study. The audiological test was carried out under appropriate test conditions by the researchers and the research assistants, while the reasons for the audiological assessment were explained to all participants. In order to identify qualified patients for the study, the assessment procedure was in two stages. At the first stage, the participants were given a questionnaire to obtain relevant information such as personal data, health status, auditory function, risk factors of hearing loss and so on and screened with a clinical otoscope which was used to look into their auditory canals. This was done to screen for ear symptoms, presence of cerumen (ear wax), shed skin, pus, canal skin edema, foreign body, and various ear diseases that could obscure any view of the eardrum and also severely compromise their eligibility for the second stage of the assessment which was audiometric evaluation.

The second stage was carried out in a sound free environment with a patient at a time, and appropriate instruction was given to each participant. A diagnostic audiometer was used to determine the degrees, types and hearing configurations of all the participants during which headphone was placed on the ears of each participant and different pure tones was introduced into their ears to elicit response according to the instruction given. This procedure applied to all participants until each hearing threshold was established. Results were recorded on the audiogramme for further interpretation. After the participants with hearing loss had been identified, the researchers together with research assistants studied the audiogrammes of each participant so as to determine their hearing degrees, types and patterns, after which the results were analysed using frequency counts and percentages.

Results

Research Question 1: What is the prevalence of hearing loss among the elderly with hypertension Ibadan?

Table 1: Prevalence of hearing loss among the elderly with hypertension

Variable	Frequency	Percent
Number of the elderly with hearing loss and hypertension	127	73.8
Number of the elderly without hearing loss, but with hypertension	45	26.2
Total	172	100.0

Table 1 shows the prevalence of hearing loss among the elderly with hypertension in this study. Finding reveals that, of the total number of the participants in the study, 127 participants representing 73.8% had hearing loss with hypertension, while 45 participants representing 26.2% had hearing loss which was not as a result of their hypertensive state of health. Hence, 26.2% of the total participants were not eligible for the study and were screened out. This implies that hearing loss is prevalent among the elderly with hypertension, as the larger percentages of the participants have hearing loss due to hypertension.

Research Question 2: What are the risk factors of hearing loss among the participants?

Table 2: Risk factors of hearing loss among the elderly with hypertension

		Noise Exposure	
Have you been exposed to loud sounds at work or during your free time?	Yes	57	44.9
	No	70	55.1
	Total	127	100.0
If Yes, how often do you get exposed to loud noise?	No Response	70	55.1
	Occasionally (Between 2 to 5)	57	44.9
	Often (More than 5 hours/day)	0	0.00
	Total	127	100.0
Which of the following sources of loud sound applies to you?	Generator set	16	12.6
	Vehicle (Traffic) Noise	31	24.4
	Loud Music	8	6.3
	Heavy machine/equipment	2	1.6
	No response	70	55.1
	Total	127	100.0

Table 2 indicates that the majority who were 70 (55.1%) of the total participants were not exposed to loud sounds at work or during their free time and 57 (44.9%) claimed to have been exposed to such loud sounds. This implies that majority of the participants were not exposed to loud sounds at work or during free time.

Moreover, majority 57 (44.9%) of the total participants who were exposed to a loud noise were occasionally between 2 to 5 hours/day. It implies that majority of the participants never got exposed to loud noise. Meanwhile, 31 (24.4%) claimed to have been exposed to loud sounds from Vehicle (Traffic) noise, 8 (6.3%) said loud music, and 1.6% mentioned heavy machine/equipment, 16 (12.6%) said generator set. It indicates that Vehicle (Traffic) noise applied to the majority of the participants.

Table 3: Risk factors of hearing loss among the elderly with hypertension

Social lifestyle :Cigarette smoking behaviour

Risk factors	Response	Frequency	Percentage
Have you ever smoked cigarette?	Yes	50	39.4
	No	77	60.6
	Total	127	100.0
Are you a current smoker?	No	106	83.5
	Yes	21	16.5
	Total	127	100.0
Do you believe that smoking can damage your health/hearing?	No Response	110	86.6
	Yes	12	9.4
	No	5	3.9
	Total	127	100.0

Table 3 shows cigarette smoking as a risk factor of hearing loss among the elderly with hypertension. Of the total participants 39.4% responded in the affirmative when asked if they had smoked cigarette, while 60.6% participants responded otherwise. This implies that majority of the participants had not smoked cigarette before. Meanwhile, of the total participants 16.5% were current smokers and 83.5% were not.

Table 4: Risk factors of hearing loss among the elderly with hypertension

Social lifestyle : Alcohol consumption				
Risk factors	Response	Frequency	Percentage	
Do you drink?	Yes	21	16.5	
	No	106	83.5	
	Total	127	100.0	
If No when did you stop drinking alcohol?	Not Applicable	106	83.5	
	1990	1	.8	
	1997	1	.8	
	1998	1	.8	
	2000	1	.8	
	2001	9	7.1	
	2002	1	.8	
	2004	3	2.4	
	2005	1	.8	
	2008	2	1.6	
	2009	1	.8	
	Total	127	100.0	
	If Yes how many bottles/week on average do you consume?	Not Applicable	106	83.5
		0 - 1	8	6.3
1 -3		13	10.2	
Total		127	100.0	

Table 4 shows alcohol consumption as a risk factor of hearing loss among the elderly with hypertension. The results reveal that 83.5% of the total participants do not consume alcohol, while 16.5% were not consuming alcohol. However, 10.2% of the participants who were drinking alcohol consume 1-3 bottles per week on the average.

Table 5: Risk factors of hearing loss among the elderly with hypertension

Participation in physical activities			
Risk factors	Response	Frequency	Percentage
In a normal week, do you do any activity on any day that makes you breathe heavier than normal?	Yes	47	37.0
	No	80	63.0
	Total	127	100.0
If Yes, what level of physical activities do you have while at work?	Not Applicable	80	63.0
	Light	30	23.6
	Moderate	17	13.4
	Total	127	100.0
What level of Physical activities do you have while commuting to and from work?	Total	127	100.0
	None	10	7.9
	Using motorised transportation or walking/ cycling	103	81.1
	Walking or cycling 1 to 29minutes	9	7.1
	Walking or cycling less 30 minutes	5	3.9
	Total	127	100.0
What level of activities do you have during your leisure time?	None	81	63.8
	Low	28	22.0
	Moderate	17	13.4
	High	1	.8
	Total	127	100.0

From the Table 5 above, it can be deduced that majority of the total participants who were 80 and representing 63.0% did not engage in physical activities, while only few of the participants who were 47 representing only 37.0% of the population engaged in light to moderate physical activities.

Research question 5: What are the degrees of hearing loss among the elderly with hypertension?

Table 6: Degrees of hearing loss

Degrees of hearing loss	Right ear	Left ear
Normal	7(5.5%)	7(5.5%)
Slight	10(7.9%)	15(11.8%)
Mild	44(34.6%)	41(32.3%)
Moderate	46(36.2%)	44(34.6%)
Moderately severe hearing loss	18(14.2%)	17(13.4%)
Severe	2(1.6%)	3(2.4%)
Profound	0(0.0%)	0(0.0%)
Total	127(100.0%)	127(100.0%)

Table 6 shows the various degrees of hearing loss among the elderly with hypertension. Of the participants 5.5% right ear and left ear 5.5% are normal, 7.9% right ear and 11.8% left ear showed slight HL, right ear 36.2% and left ear 34.6% are mild. Also, 34.6% are mild at the right ear and 32.3% at left ear, while 36.2% and 34.6% for right and left ear respectively are moderate. Likewise, 14.2% are moderately severe hearing loss at right ear, and 13.4% at left ear. 7.9% are slight at right ear, and 11.8% at left ear, while 1.6% severe at right ear and 2.4% at left ear. None of the participants showed a profound HL on both ear. This implies that majority of the elderly with hypertension had moderate degree of hearing loss.

Research question 6: What are the patterns of hearing loss among the elderly with hypertension?

Table 7: Patterns of hearing loss

Patterns	Right Ear		Left Ear	
	Frequency	Percentage	Frequency	Percentage
Low Frequency	38	29.9	37	29.1
Mid Frequency	41	32.3	39	30.7
High Frequency	48	37.8	51	40.2
Total	127		127	

Table 7 reveals the observed patterns of hearing loss among the elderly with hypertension. Among the participants, 38 (29.9%) had low frequency hearing on the right ear, while mid frequency and high frequency were 41 (32.3%) and 48 (37.8%) respectively. The left ear analysis shows that 37 (29.1%) of the participants had low frequency hearing, with the mid and high frequency being 39 (30.7%) and 51 (40.2%) respectively.

Discussion of Findings

The study reveals higher percentage of hearing loss among the elderly with hypertension in the population understudied. This shows that hearing loss is a

chronic disease, and it is common among the elderly, of which the presence of high blood pressure can be an accelerating variable. Also, the male elderly participants predominate in hearing loss over their female counterparts with hypertension. The finding therefore corroborates the study of Cruickshanks et al. (1998), Frank, Thorpe, Gordon-Salant and Ferrucci (2011), Ogah (2014) who had higher prevalence of hearing loss among the population studied. Ogah (2014) in a five year review on the prevalence of sensorineural hearing loss (SNHL) among the elderly in Lokoja, Nigeria, found higher prevalence of SNHL among the elderly and age related degenerative changes in the organ of corti were found to be most common cause. Cruickshanks et al. (1998) noted that there were more males with hearing loss. Consumption of alcohol appeared not to be significant to hearing loss. The results showed that 83.5% of the participants were not drinking alcohol, while 16.5% were drinking alcohol. However, majority of the total respondents who were drinking alcohol 1-3 bottles per week, while some had stopped drinking alcohol for over 5 years prior to study period, which could possibly may not be a risk to their hearing. This study therefore corroborates a study by Sogebi (2013). The study confirmed that consumption of alcohol appears not to be a significant risk factor of hearing loss among the population studied.

The study also reveals that majority of the elderly who are treated for hypertension had a sloping audiometric patterns of hearing loss bilaterally with various degrees of loss ranging from mild to severe hearing loss, while majority of the elderly had moderate degree of hearing loss. Although a similar study, where the data reported, based on measured thresholds of 3,753 adults, Cruickshanks et al., (1998) showed that the average hearing thresholds of men were typically poorer than those of women in the high frequencies, with men exhibiting a sharply sloping hearing loss in the moderately severe range in the high frequencies, and the women exhibiting a more gradual sloping hearing loss in the moderate range in the high frequencies. It also lends credence to the study by Luciana et al. (2006) who identified the likely association between hypertension and hearing loss using a non-paired case-control study. Luciana et al. (2006) noted that despite these structural changes caused by age, many authors mentioned prebycusis, which usually starts at around 65 years of age and is a hearing loss type accruing from ageing itself and is associated to specific audiological characteristics, being a descending, bilateral and symmetrical sensorineural hearing loss type. The finding also supports Marchiori et al. (2006), who recorded bilateral and symmetrical sensorineural hearing loss type in a bid to identify likely association in between blood hypertension and hearing loss.

Conclusion

This study has been conducted to investigate and provide information on prevalence, risk factors and patterns of hearing loss among the elderly with hypertension in Ibadan Metropolis. The study established that the majority of elderly patients possessed gradual downward sloping patterns of hearing loss and a moderate sensorineural hearing loss. The findings also revealed that a significant relationship between age group and hearing loss among elders with hypertension is evident. This implies that, increased threshold is higher among the older adults. The findings also shows that smoking taking, alcohol drinking and engaging in physical activities significantly and jointly correlated with hearing loss among the elderly with hypertension.

Based on the findings, it is recommended that non-drug treatment, like gradual reduction in the body weight, diminished dietary salt consumption, discontinuation of smoking, decreased alcohol consumption and regular exercise should be encouraged among the elderly and regular monitoring of blood pressure should be encouraged among the elderly in order to curtail the high prevalence of high blood pressure. Also, hearing test for the elderly especially among those with hypertension attending hospitals should be mandated. In doing this, it will help for early detection which could aid early initiation of hearing intervention in order to curtail the menace of increased loss of hearing among the elderly.

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