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PREVALENCE AND PATTERNS OF HEARING LOSS AMONG THE ELDERLY WITH CIGARETTE SMOKING AND ALCOHOL EXPERIENCE

BY

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Abstract

Hearing loss is a very common disabling condition among the elderly, as it is estimated that approximately one-third of persons above 60 years have hearing loss across the globe, some of which are due to social habits such as cigarette smoking and alcohol drinking. Thus, this study investigated the prevalence, types, and patterns of hearing loss among the elderly with smoking and alcohol experience in Ibadan metropolis. 100 elderly (M= 78; F=22), aged 65 - 70 years purposively selected participated in the study. The pure-tone audiometry determined the types and patterns of hearing loss of the participants, and the structured questionnaire determined their smoking and alcohol experience. Hearing loss was found prevalent among the elderly with smoking and alcohol experience (85%), mixed hearing loss was the predominant type (74%), while sloping pattern of hearing loss (72%) was found predominant among the participants. Males (67) had more cases of hearing loss than the females (18). Therefore, there should be a thorough awareness campaign towards educating the general populace about the implications of indulging in negative social habits such as cigarette smoking and alcohol taking.

Keywords: Hearing loss, Theelderly, Pure-tone audiometry, Smoking and alcohol experience.

Introduction

Ageing is not a uniform process in all people, but it is unique in each individual, and generally true that most elderly people experience deterioration in their sensory organs, while sense of hearing could be greatly affected. It is estimated that an average of one in ten people have some degrees of hearing loss (Cruikshanks, Wiley, Tweed, Klein, Klein, Mares-Perlman, & Nondahl; 1998), but above the age of 60, the estimate changes to one in four and over the age of 70, to one in two. According to National Association for Deafened People (NADP, 2013), everyone loses hair cells in the cochlea as they get older, and gradually, their hearing deteriorates and becomes less sharp as age advances. Thus, hearing loss is one of the most prevalent chronic conditions affecting the elderly, and its severity is associated with reduced quality of life in older adults (Dalton, Cruickshanks, Klein, Klein, Wiley, & Nondahl; 2003).

Global estimates for hearing loss population who are above 65 years stagger and keep increasing. According to the World Health Organization (2012), there were 164.5 million persons of above 65 years with disabling hearing loss. This is approximately one-third of the population of persons above 65 years. Also, it is estimated that the population of persons above 65 is growing at a faster rate than the general world population. It has projected that the world population will grow from 6,853 million to 7,770 million in the period 2010-2020 (a growth rate of 11%), while the population of people aged 65 years or more will grow from 626 million in 2010 to 855 million in 2019, representing a growth of 37% (WHO, 2012). Thus, it is expected that the overall proportion of people aged (over 65 years) with hearing loss will increase over time. Also, the prevalence of hearing loss in persons above 65 years is higher in Sub-Saharan Africa, Asia, Pacific, and South Asia. In fact where the per capital income and literacy level is low, the higher is the prevalence of hearing loss (WHO, 2012). Hearing loss can be unilateral (one ear) or bilateral (both ears), temporary or permanent; stable or progressive in nature. Hearing loss could be classified as conductive, sensorineural or mixed

hearing loss. These types of hearing loss are based on the site of structural damage or blockage. Conductive hearing loss occurs as a result of difficulty with the outer and/or middle ear functioning, while Sensorineural hearing loss occurs as a result of damage to the inner ear, the cochlea, and/or the fibers of the eighth cranial nerve. A mixed hearing loss is the combination of both conductive and sensorineural components. Conductive hearing loss has readily identifiable causes such as build-up of ear wax or presence of a foreign object(s) in the ear, perforated eardrum, genetic and congenital abnormalities, otitis media, and otosclerosis. Sensorineural hearing loss is caused by ototoxic drugs, Meniere's diseases, viral and bacterial/ infections, trauma, cardiovascular conditions which have more grievous consequences on the individual. Progressive bilateral sensorineural hearing loss which starts from the middle age and continues into the older years is a characteristic of age-related hearing loss. Some of the risk factors associated with hearing loss are preventable or avoidable, such as smoking, alcoholism and high body mass index, occupational noise, cardiovascular disease, and diabetes.

Tobacco smoking can contribute to inner ear hearing loss, according to Cruickshank et al (1998). Smoking significantly has capacity to significantly cause high-frequency hearing loss, and the effect could be much on those who engage in it, especially older individuals. Effect of smoking remains significant when accounting for cardiovascular disease or related conditions. Therefore, a healthy lifestyle can serve as a protection against age-related hearing loss, as one advances in age. Yehonatan, Idit, Moshe and Arieh (2002) submitted that the most frequent types of hearing loss found among the smokers were mild, flat, and sensorineural hearing loss as well as conductive hearing loss. Cigarette smoking may affect hearing through its effects of antioxidative on the human auditory mechanisms or on vasature supplying the auditory system. Smoking is a risk factor for both cardiovascular diseases and lung cancer. Cigarette smoking could disrupt the normal hearing mechanism and facilitate infections or organism entry into the body. The resultant effect of middle ear infection can be very painful, as pressure and fluid build-up in the ear can be hazardous. Continued exposure to tobacco may result in persistent middle ear infections and eventually, hearing loss (Cruickshank et al, 1998).

There are a number of ways in which smoking could affect eustachian tube function and tympanometry findings, including a direct effect of irritants of tobacco smoking and the mucosa of the middle ear and Eustachian tube, and increased respiratory tract infection (Taghreed, 2009). Some authors reported that smoking, and reducing oxygen supply in the inner ear may cause either cochlear damage or mitochondrial mutations, resulting in hearing loss; it is also universally accepted that alcohol abuse increases the risk of age related hearing loss in heavy drinkers. Regular smoking and excessive drinking in old adult or elderly have both immediate and long-term health consequences (OECD, 2013).

A reduction in hearing sensitivity was previously considered to be a normal age-related occurrence. However, other health variables, apart from age, play significant role in the sensory changes. Variables like illicit sex, previous illnesses, and smoking, drinking of alcohol and vascular alterations or exposure to noise can affect hearing functions and could also lead to the progression of hearing loss, including age-related hearing loss. Consequently, some authors have suggested that age-related hearing loss could be preventable by avoidance or control of these risk factors (Sogebi, 2013). Drinking alcohol and cigarette have been observed as having many adverse effects on the hearing abilities, psychosocial life and daily activities of individual who engage in such habits.

The auditory system changes as a consequence of ageing related factors and past negative social habits such as cigarette smoking and alcohol experiences and ageing related diseases. Deterioration of the auditory system with age leads to changes not only in hearing sensitivity, but also to a general decline in the processing of speech stimuli, particularly in less-than-ideal listening environments. Hearing sensitivity decreases with increasing age among elderly even faster especially with those who had negative past experience.

It has been observed that there has been increased compliant hearing loss among the elderly in our society nowadays, and a quiet of number of them had exposure or indulged in related conditions alcoholism and smoking of cigarette, while some were due to ageing and other environmental risk factors. These have been observed having great impact on the hearing functional ability (hearing loss), psycho-social life and daily life activities, as the age advances. Thus, the elderly with such conditions are more likely to report symptoms of depression, dissatisfaction with life, reduced

functional health, and withdrawal from social activities and family engagements. The effect of ageing as well as aftermath of cigarette smoking and alcohol on the hearing of an elderly in our society have serious implications on the hearing ability and psycho-social life, even with substantial economic costs and social consequences on the elderly individuals. To investigate the above observation, it is pivotal to conduct a thorough study which will mirror out the relationship between these social habits and hearing deficiency in elderly, thus necessitating the study.

Purpose of the Study

The main purpose of the study was to determine the prevalence, types, and patterns of hearing loss among the elderly with smoking and alcoholic experience. Other specific purposes were to determine the dominant gender in hearing loss of the elderly with cigarette smoking and alcohol experience; and reduction in hearing functions based on each of the ears (whether right or left ear)

Research Questions

In order to achieve the purposes presented above, the following research questions were raised:

1. What is the prevalence of hearing loss among the elderly with smoking and alcoholic experience?
2. What are the types of hearing loss among the elderly with smoking and alcoholic experience?
3. What are the patterns of hearing loss among elderly with smoking and alcoholic experience?
4. What is the gender composition in hearing loss among the elderly with smoking and alcoholic experience

Design

The design of the study was a descriptive research design of the survey type.

Population of the Study

The target population for this study comprised the elderly (men and women) with chronological age 60 and 70years and above in Ibadan metropolis, who had experience of cigarette smoking and alcohol drinking in times past.

Sample and Sampling Techniques

100 (M= 78, F= 22) elderly individuals were purposively selected as the participants for the study, drawn from three selected areas of Ibadan, based on their elderly status and past indulgement in alcohol and smoking habit. 33 of the participants were between 61 and 62 years, 20 between 63 and 64 years, 26 were aged between 65 and 66 years, 12 were between 67 and 68 years, and 9 were between 69 and 70 years. 19 (18 males 1 female) had only smoked, 42 (23 M, 19 F) took alcohol, while 39 (37 M, 2F) smoked and took alcohol. Further, 13 of the participants had smoked for 1-5 years, 20 for 6-10 years and 25 for more than 10 years. 48 of the participants do take cigarette every day, and 38 have been smoking for a long period of time. In addition, 29 of the participants have had alcohol experience between 1 and 5 years, 21 between 6 and 10 years, and 48 above 10 years, while 2 do not have alcohol experience. 62 of the participants claimed to take alcohol to cool off, 51 first in the morning to stimulate themselves. Purposive sampling technique was used to select the participants based on their social habit.

Instrumentation

The portable audiometer and a self-developed questionnaire were the instruments used for the study. These were the diagnostic packages suitable to determine the hearing status of these elderly individuals following the Pure Tone Audiometric (PTA) testing procedure, and the demographic information to relay their smoking and alcohol experience.

Method of Data Analysis

The data collected through the research instruments were analysed using frequency counts and percentages.

Results

RQ1: what is the prevalence of hearing loss among the elderly with smoking and alcohol experience?

Table 1: Prevalence of hearing loss among the elderly with either smoking or alcohol experience

Gender	Elderly with hearing loss	Elderly without hearing loss	Total
Male	67	12	79
Female	18	3	21
Total	85	15	100

Table 1 shows that 85 of the 100 participants with smoking and alcohol experience presented with hearing loss, as only 15 do not present with any form of hearing loss. 67 (84.8%) of the male gender presented with different types of hearing loss, while 18 (85.7%) of the female gender presented with hearing loss. In essence, cases of hearing loss were found to be high among the elderly with cigarette smoking and alcohol experience.

Discussion of Findings

The findings of this study on the prevalence of hearing loss shows that more participants who either smoke or drink have hearing loss than participants not exposed to these social habits. This means that smokers or alcohol takers are more likely to experience hearing loss of any kind, as 85% of the participants experience hearing loss. This finding therefore, substantiate earlier finding that smokers are nearly 70% more likely than non-smokers to suffer hearing loss, in a study including more than 3,000 people, wherein it was concluded that that the risk of hearing impairment often increases with the number of cigarettes smoked (Cruikshanks, Wiley, Tweed, Klein, Klein, Mares-Perlman, & Nondahl, 1998). Cruikshanks et.al noted that in record, hearing problems increase proportionately with the intensity and duration of exposure to cigarette smoke, and that in general, smokers are 1.69 times more likely to damage their hearing ability, and heavy smokers more than 1.30 times as likely to have a hearing loss in all age groups but the oldest. This finding further supports the finding of Chang, Ryan, Jun, Hwang, Song and Chae (2016), where current smoking was found associated with hearing impairment in both speech-relevant frequency and high frequency across all ages examined, and Dawes, Cruikshanks, Moore, Edmonson-Jones, McCormack, Fortowm and Munro (2014), where alcohol consumption was associated with reduced odds of hearing loss and smoking with increased odds of hearing loss.

RQ2: What are the types of hearing loss (in both ears) among the elderly with either smoking or alcoholic experience?

Table 2: Types of hearing loss (in both ears) of the elderly with either smoking or alcohol experience

Types of hearing loss	Frequency	Percentage (%)
Normal hearing Acuity	30	15%
Conductive hearing loss	26	13%
Sensorineural hearing Loss	70	35%
Mixed hearing loss	74	37%
Total	200	100%

Table 2 shows the distribution of the types of hearing loss found among the participants on both ears (right and left ears). Only 30 (15%) of the participants had normal hearing acuity, while 74 (37%) of the participants had mixed hearing loss, 70 (35%) had sensorineural hearing loss, and 26 (13%) had conductive hearing loss. Therefore, the commonest type of hearing loss among the participants at both ears were mixed hearing loss, followed by sensorineural hearing loss, and conductive hearing loss, while few of the participants have normal hearing loss.

Discussion of Finding

The finding on the types of hearing loss of the elderly with smoking and alcohol experience showed that mixed hearing loss was predominant in both ears of the participants, followed by sensorineural

hearing loss. This further shows the deleterious effects of hearing loss on the elderly with smoking and alcohol experience. This finding thus corroborate Sogebi (2013) finding that smokers had significantly increased odds of developing sensorineural hearing loss compared with non-smokers, and with Rosenhall, Sixt, Sundh and Syanborg (1993) submission that chronic alcohol abuse has been associated with hearing loss among the elderly.

RQ3: What are the patterns of hearing loss among the elderly with smoking and alcohol experience?

Table 3: Patterns of hearing loss on both right and left ear among the elderly with smoking and alcohol experience

Patterns of Hearing Loss	Frequency	Percentage (%)
Normal	30	15%
Flat	26	13%
Sloping	144	72%
Total	200	100%

Table 3 shows the hearing patterns obtained for the ears of the participants, 144 (72%) ears of the participants were with sloping patterns, normal pattern was 30 (15 %), while the flat patterns was 26 (13%). Thus, sloping pattern of hearing loss was predominant among observed patterns of hearing loss found with the elderly sampled.

Discussion

The result on the patterns of hearing loss clearly explains that the predominant pattern among the elderly with smoking and alcoholic experience were sloping pattern substantiating Olaosun, Ogundiran and Tobih (2013) finding of sloping type as a predominant audiometric pattern among the elderly with age-related hearing loss.

RQ4: What is the gender dominance in hearing loss among the elderly with smoking and alcohol experience?

Table 4: Gender dominance in hearing loss among the elderly with smoking and alcoholic experience

Gender	Variables	Frequency	Percentage
Gender	Male	67	79%
	Female	18	21%
	Total	85	100%

Table 4 above reveals that of the elderly with hearing loss, 67 (79%) were males and 18(21%) were females. Therefore, cases of hearing loss were prevalent among the male gender from their female counterparts owing to the fact that more males indulged in negative social habits than the females.

Discussion of Findings

The finding on the gender disposition to hearing loss of the elderly with smoking and alcohol experience shows that more males had hearing loss than the females. This shows that there is a higher incidence of hearing loss among male elderly than their female counterparts, thus acquiesced Rosenhall, Jonsson, and Soderlind, (1999) submissions that hearing loss is more prevalent among males as compared to females and the degree of hearing loss is likewise higher in males.

Conclusion

This study purposively investigated the prevalence, types, and patterns of hearing loss among the elderly with cigarette smoking and alcohol experience in Ibadan metropolis. Based on the data collected and analysed the incidence of hearing loss among the elderly with alcohol and smoking experience residing in Ibadan was high. It was discovered that, consumption of alcohol appears to be a significant risk factor for hearing loss, especially for the elderly between the ages of 65 and 70years. Mixed hearing loss as a type of hearing loss was found common among the types found, while normal hearings were found among the elderly, but in a small proportion (30%) from the total population. Thus, more than seven out of ten had sensorineural hearing loss, due to observed social

habits. The majority of those with hearing loss had the classical sloping hearing pattern of hearing loss. However, the prevalence of hearing loss especially among the elderly can be reduced, at least to the barest minimum if not totally prevented by addressing the etiological factors.

Based on these findings, the following recommendations are made:

Recommendations

1. Audiological measures should be conducted on all elderly individuals to investigate the prevalence of hearing loss due to their past experiences and exposures.
2. Adequate or comprehensive rehabilitation options must be given to those identified with hearing loss
3. There must be a thorough awareness campaign towards educating the general populace about the implications of indulging in negative social habits
4. More strategic initiatives needed to be developed to encourage total adherence to hearing conservation strategies. These should include initiatives directed to the elderly, by encouraging good healthy living, and avoidance of known risk factors of hearing loss and age-related diseases/ailment.
5. Health workers, and other allied professionals working with the elderly should focus more on promotion of good healthy living and habits, and prevention of the conditions so as to reduce the incidence of hearing loss.

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