NOISE EFFECT ON HEARING ACUITY OF MOTORCYCLE RIDERS POPULARLY CALLED OKADA IN AKURE, ONDO STATE.

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Abstract

This study was conducted to evaluate the effect of noise on the hearing acuity of the okada machine riders in Akure, Ondo State, based on the years of exposure and their age; since findings have emphasized the deliteriorating effects of noise in influencing permanent and temporary threshold shift of workers in both Nigeria and Overseas. Forty Motor cycle riders were randomly assigned to two groups based on the number of years they have been riders of okada machines as well as their response to the questionnaire indicating their age. The study used quasi experimental design to measure the hearing acuity of okada business people both at initial time and after the six month of commencing the research.The result analysis was based on pure tone audiometric average at 500Hertz, 1000Hertz, 2000Hertz and 4000Hertz respectively, where it revealed a diminished hearing sensitivity, especially among the workers who had spent above 5 years in the okada business. Recommendations were made to NISHA and FEPA to initiate campaign programmes on Radio and Television media for both workers of okada riders, Industrial worker and employees of Labour on the evil effect of noise hazard in our environment.

Introduction

Noise is an unwanted sound, it is derived from the latin words 'Nausea – meaning sea sickness. Noise is among the most pervasive pollutants today with its attendant effect of an acoustic trauma or hearing loss to the individual and the general populace. Noise induced hearing loss occurs in a high level exposure over a long period of time. Noise induced or acoustic trauma in recent times has become the focal point for the individuals, institutions, associations and the government alike. This is because acoustic trauma which is caused by noise has seriously become health hazard, especially in Nigeria as a result of uncontrolled noise pollution especially as regards to the Okada rider group of people, who rode machines unabated from morning till night as business oriented programmes. However noise pollution from industrial or environmental influences on the society is yet to be properly addressed in Nigeria by the three tiers of Government and the Individual alike, hence this study is embraked upon to create awareness for the individuals and governments to begin and make appropriate laws and edicts, while individual riding okada for business, should be aware of noise danger by using protective helmet or other devices as to curb the devastating effect of noise on their hearing acuity.

Owolawi (1998) highlighted that noise induced hearing loss is an irreversible damage and Campbell (1988) attested to the fact that noise induced hearing loss can occur secondary to even a singly very loud noise exposure (acoustic trauma). It may also occur secondary to relatively high level noise exposure over a long period of time, as in okada rider who kicked and ride machine frequently. The risk of noise induced hearing loss is always related to both to the sound intensity and duration; while the individual susceptibility to noise induced hearing loss is based on large extent to some certain factors such as genetic predisposition, tobacco abused, Autotoxin, oxidative state and dyslipedemic, which usually play some roles to ones susceptibility.

Noise from road traffic, jet planes, garbage trucks, constructing processes, tools, motor bikes alias okada, to name a few, are among the unwanted sounds that are routinely broadcasted into the air. The problem

with noise is not only that it is unwanted, but also that it negatively affects human health and well being. Problems related to noise include, hearing loss, stress, high blood pressure, sleep loss, dstraction and loss of productivity as well as a general reduction in the quality of life and opportunities for tranquility in the environment. Although, we experience noise on some occasions, one can be both the cause and the victim of noise, such as the okada riders by operating noisy appliances, equipment or their machine. There are instance when one experience noise generated by other, just as people experience second hand smoke, while in both instances noises are ritually damaging. Second hand noise is even more trembling because it has negative effect on the individuals.

Campbell, (1998) claimed that usually, the first indication of noise induced damage is Temporary Threshold Shift (TTS). This occurs when the patient experiences a change in hearing after noise exposure, but the hearing gradually returns usually over sixteen (16) hours. However, with repeated exposure the hearing only partially returns to its former threshold of hearing level, and consequently the patient develops Permanent Threshold Shift (PTS). The first indication of permanent noise induced damaged is generally 'noise' 'notch', which is a sensorineural dip in the audiogram at around 4000 Hertz. This characteristics are common with okada riders because of their long term exposure to noise generated machine, and it can be temporary or permanent noise. It can also trigger a stress responses, while Tinnitus frequently accompanies noise induced hearing loss for the okada riders especially.

In developed countries, Occupational Health and Safety Administration (OSHA) specifies Permissible Noise Exposure Level (PELS). The Environmental Protection Agency has similar standards to protect the average industrial worker from Threshold shift especially Permanent threshold shift (PTS). Pelton, (1998) indicated that for every 5dB increase in the noise level, the allowable exposure duration is halved, for example permissible exposure levels for 4 hours duration is 95dB sound level, while 105dB sound level is only permissible for 1 hour duration per day. In Nigeria such law has not been effected and intensified upon. Ruiseaux (1999, stated

in research that Kentucky awarded the local ordinance to be tougher on noise from bars and cars, wheat nobody cares in Nigeria on any, edict or law to combat noise. Burtkan and Chick (1999) in their research investigation on Recreational noise, Lawnmowers, motorcycles, children toys and music noise sources reported, that noise generated by these sources exceed levels for safe exposure. Although, the researcher explained that recreational exposures, less frequent, and of shorter duration than occupational exposure, but that each has a noise effects that is enough to damage hearing, that could cause noise-induced hearing loss. The examples of such non-industrial noises are as follows.

Non-Industrial Noise	Sound level in dB
Shot gun	140dB generated
Jet engine	130dB generated
Rock concert	120dB generated
Automobile horn	110dB
Chain-saw	100dB
Siren	90dB

In Owolawi and Williams (1996) study of ninety one motor assembly plant workers in Lagos state, stated that noise and changes in hearing threshold as a result of years of exposure was found to be significant ranging from 85dB to 100dB.

Lean (1999) reported on British Noise Act, which encouraged local councils, to set up teams of late night noise inspectors, who patrol around the lock and issues immediate fines, proposed Bills encourage the use of teams between 11pm and 7am to respond to noise violators. Noise over 35dB could be drawn on the spot of one hundred pound fine (£100). National co-ordinator of noise network, emphasized that councils should be required to implement the Noise Act, since it is critical for those disturbed by noise. It is interesting to know, that if nations, which have assess to all sorts of hearing protectors, could take and enforce these preventive steps, it is obvious that

Nigeria need to make appropriate laws through the environmental protection agency, to control noise broadcast in Nigeria. Alden (2000) in his article stated that factory had complied with the city noise law in overseas country because the ordinance existed while in Nigeria there is no compliance.

The objective of this study is therefore to investigate the sensitivity loss experienced by the two groups of okada riders who are between 25 to 40 years old and those between 45 and 55 years old based on the fact that ageing itself affects hearing acuity, not to talk of noise. More so, the years of exposure to noise will be determined as a pre-requisite to noises induced hearing loss, through the completion of noise induced hearing loss questionnaire (NIHLQ) and initial screening exercises with audiometer to measure their base line hearing acuity and the attendant losses that accompanied it to use as well as docimetre to measure the generated noise of the machines. The finding of this study will alert the industrial management, okada riders associations, unions, government and its relevant agencies on the hazards of noise pollution without a protective devices; as well as to educate the public on the health and risk of hearing loss on the society and the individuals, due to unabated noise exposure, via adequate noise propaganda programme, on the radio and television programmes after this study.

METHODOLOGY

Design

The study used a comparative causal design to investigate the auditory acquity of the okada machine riders depending on the duration of their work, exposure, years and age.

Sample

Stratified random sampling technique was used to collect 20 subjects each from those who had stayed 10 – 15 years in okada business and those who had just spent 5 years in the okada business in Akure. More so, the age at which the respondents started okada and the age at which they were presently, were collected through the completion of self assessment

noise exposure questionnaire tagged "Noise induced hearing loss questionnaire" (NIHLQ). The questionnaire contain 20 items which seek to find out relevant information on years of exposure, duration of exposure, age, hours of noise exposure per day, occupational history, medical history/ complaint, cases of hearing loss, effect of hearing loss and social history which were given to the respondents to complete.

Instrument

Four instruments were used to collect data for the study. They are: (1) 20 items structured questionnaire (2) Amplaid A37 audiometer was also used to screen the okada riders initial hearing level and later hearing after 6 months. (3) Noise docimetre was used to measure the sound that are generated by each okada machine per day (4) Otoscope – was used to examine the tympanic membrane for accumulated wax/cereumen or other additional ear ailement such as discharge or tinnitus.

The audiometer measures the pure tone and bone conduction assessment of the okada riders, prior and during the research session. The electro acoustric and biological caliberation of the audiometer was done by an electro acoustic engineer at lagos before embraking on the study, and it was calibrated to the I.S.O standard of 389:1985. The set of TDH 39 ear phones, with type MX411AR type cushions, was used to feed the tone to the workers ears.

The Procedure

The Researchers paid several visits to the okada workers to familiarize themselves with the workers, to build rapports, screen the respondents and to give and collect questionnaires from the okada business people, who were the respondents. A particular week was agreed upon for the Screening and completion of the questionnaire and the final hearing test. Those that were finally selected were-re-tested at six months interval

after, the first screening of the respondents. Docimeter was given to the okada rider leaders, to record the noise generated by their machines on a daily basis, while the researchers visited and recorded the machine results in a booklet daily.

Data Analysis

The Analysis of Data collected made use of percentages, means, and audiometric average statistical tools for the respondents hearing acuity. Assessment of pure tone air conduction tests was performed using frequencies of 500, 1000, 2000 and 4000Hz as recommended by ASHA, 1994.

Group A	Initial		Final		Initial		Final		Initial		Final		Initial		Final		Initial		Final		Initial		Final	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB	dB
Intensity	22.4	20.0	2.9	22.5	26.5	27	32.8	33.7	25	27	37.9	33.9	30	27.5	40	36.8	103.9	10.5	139.7	126.9	26	25.4	34.9	31.7
Age 20-44 years Exposures Level less than 5 years years n= 20	N.B Group Average mean = Initial - Right = 26 = Initial - Left = 25.4 Final Right = 34.9 Final Left = 31.7																							
Group B	22.4	20.0	2.9	22.5	26.5	27	32.8	33.7	25	27	37.9	33.9	30	27.5	40	36.8	103.9	10.5	139.7	126.9	26	25.4	34.9	31.7
Age 45-55 years Exposures Level above 10-15 years n= 20	N.B Group Average mean = Initial - Right = 38.1 = Initial - Left = 29.7 Final Right = 49.8 Final Left = 50.0																							

The above table clearly indicated that the okada riders whom their left ears decides at initial measurement was 25.4 decibels after six months it measure 31.7 decibels, it implied a loss; while the right ears at initial measurement was 36 dB after six months it diminishes to 34.9 decibels, it implied a loss, hence riding machines causes hearing loss in the above table for Group A although the left ear is better than right ear in the 5 years or less exposure group. This in line with Owolawi and Williams (1996) study who found that on the average of 2.17dB to 11.67dB loss was recorded per year for Automobile Assembly workers, who were exposed to noise induced hearing loss for a continuous period of 7 years. Similarly , table 1 revealed that those who are old in riding the machines (level of exposure) as well as old in age had the right ear decibel measurement initially at 38.1 decibels and the left ear measurement was 29.7 decibels; but after six months their hearing level diminishes, the right ears has 49.6 decibels and the left ears has 50 decibels. It appears that both the left and right ears performed woefully, and they are characterized by sensorineural hearing loss. (they can not hear high pitched sound). In all the frequencies tested (four), the okada riders have diminished hearing loss especially for those who operated okada for above 5 years who showed greater losses, while the older you are in okada business the more your hearing have problems at the same time, the older you are the more your hearing goes home, because of diminishing returns, since Young (1994) attested to the fact that "as people get older their hearing may change , and that the extent of these changes depends on factors like heredity, illness, accidents and exposure to environmental noise". Young (1994) further lamented that in the older people, the more serious problem they experienced is that, they loss certain pitches of sound, usually high-pitched sound are lost first, and that tinnitus may accompany hearing loss such as ringing in the ear, buzzing, swiching or chicking of sound especially when there are no such sound in the environment. However, Tinnitus is hard to treat and it can be hard to diagnose in individuals while age related hearing loss can be caused by ear-wax, infections, head trauma and damage to the ear drums' or drugs. (Adams, 1993).

The study revealed that noise exposure has a deteriorating effect on the hearing acuity of the respondents and most of the respondents complained that they experienced threshold shifts ranging from Temporary threshold shift to permanent threshold shifts from questionnaire responses. The findings from this study indicated that those who had 10 years and above exposure to noise from okada machine are more at disadvantage in hearing acuity hence this finding further confirmed that duration of long exposure to noise, have a significant impact on hearing loss as found out by Ademokoya (1998), Chasing (1996), Bakare (1989) and Oleru (1980).

Figure I
Mean Hearing loss sensitivity for group A.

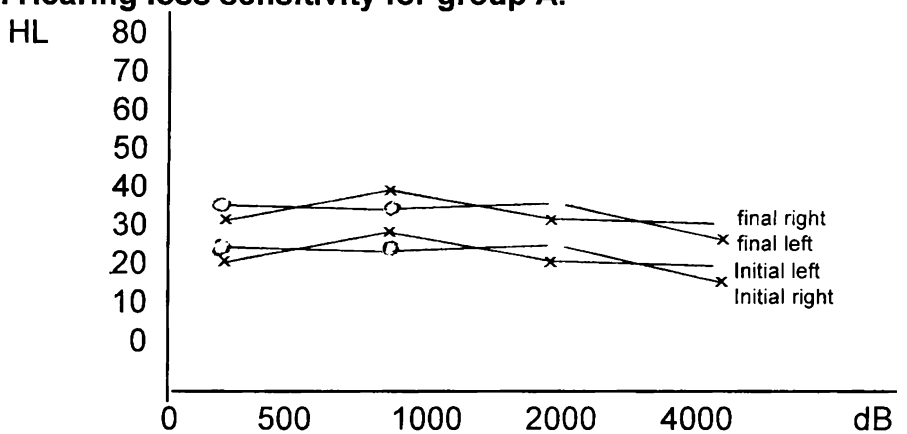

Figure I shows a gradual noise induced effect on both right and left ears of the okada riders who have operated okada transport system for upward of 5 years.

Figure II Group B
Mean sensitivity hearing loss for group B

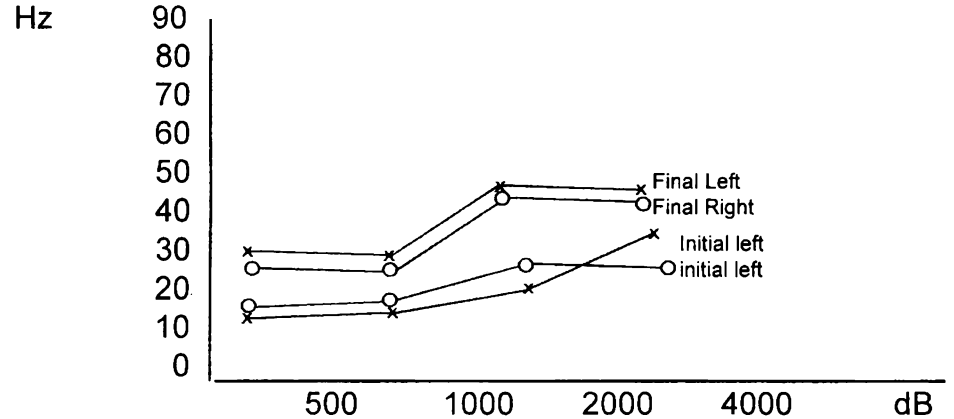

Figure II shows a mean hearing sensitivity gradual hearing loss of okada above 10 years of operating okada transport services.

Recommendations and Conclusions

The findings in this study are consistent with Owolabi and Williams (1996), Oleru (1980), who posited that duration of exposure to noise could result in the gradual debilitating effect on the hearing acuity of the individuals. In the same Vein, most of the developing countries like Nigeria are faced with deprivation, poverty and gainful employment opportunities, hence there is a need for enlightenment campaign to curb the effect of noise induced hearing loss on the populace especially the okada riders, on both the radios and television in order to curb their occupational hazard. Especially they should use the protective devices like cotton wall, ear plugs and helmet, while regular visits to the Audiologist and medical practitioner will reduce the impact of these noise generating sources in occupational engagements. More so, this enlightenment should cover noise in industry and other work place/employers education on hearing health hazards.

In Nigeria where okada transportation system is a lucrative business in all cities. Institution such as Federal Environmental Protection Agency (FEPA) should make a permissible sound level regulation for all workers in our industry and business engagement, so as to encourage ear protector device and regular medical and audiological services for those engaged in noisy environments. The Nigerian Speech and Hearing Association (NISHA) should also come up with strong representation to all tiers of government and employers of labour to make periodic audiometry test as part of the health management policy of industrial workers, who are susceptible to noise induced hearing loss, based on the fact that permissible noise levels (PELs), are specified by the Occupational Health and Safety Administration (OSHA) as well as Environmental Protection Agency in America.

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