ASSESSMENT OF HEARING ACUITY AMONG COMMERCIAL MOTORCYCLISTS (OKADA RIDERS) IN THE MAIN CAMPUS OF ABIA STATE UNIVERSITY UTURU ABIA STATE NIGERIA

Abstract

Two hundred motorcycle operators who had lasted for at least 1 year in the vocation constituted the test population, while the control group was derived from the staff and students of Abia State University, Uturu who were sex and aged matched and exposed to low noise level. Results showed that the noise level at the operational location of the test population (commercial motorcycle park) was significantly ($P<0.001$) higher than that recorded for at the control site (classroom and environs). The study revealed that the hearing threshold of the right and left ears of test group was significantly ($P<0.001$) higher than that reported for the control group at all the frequencies tested for both air and bone conductions. It was also revealed through this study that the frequency of symptoms associated with high levels of noise was significantly ($P<0.001$) higher in the test group (motorcycle operators) compared to their control counterparts (staff and students of ABSU). It was also deduced from the study that while 75 % of the test population had impaired hearing acuity, 45 % of same case was recorded for the control population. The frequency of occurrence of symptoms associated with persistent exposure excessive noise higher in the test subjects than the control. In conclusion, it was established through this study that commercial motorcycle operators within the main campus of Abia State University are exposed to excessive noise with an alarming propensity to predispose them to hearing impairment.

Key words: Hearing Acuity, Commercial Motorcyclists and Noise.

Introduction

Noise is an unwanted sound. It is a derivative of latin words “nausea” which means sea sickness. It is among the most pervasive pollutant today known to have orchestrated acoustic trauma or hearing loss [1]. Transportation has been identified as one of the major sources of community noise which has gained attention owing to the potential health risks that characterize it. Noise induced hearing loss occurs when an individual had been exposed to high level of noise exposure

over a long period of time. It is established when an individual is unable to hear or hears in thresholds greater than 25 dB in both ears [1].

Globally, hearing impairment resulting from noise has been tagged the most prevalent irreversible occupational hazard. World Health Organization (WHO) attributes 16 % of all disabling hearing loss to occupation noise exposure amounting to one third of the population of sufferers [2]. Hearing loss associated with noise is linked to debilitating conditions such as social isolation, anxiety, increased stress, depression, cognitive decline, and high risk of cardiovascular diseases and may adversely affects sufferer's efficiency in performing activities of daily living [3].

Commercial motorcycle operation has become an integral component of the public transport system in the present day Nigeria. It is a viable vocation for the teeming population of the unemployed Nigerian youths and thus can be considered an important part of the Nigerian economic system which has contributed immensely towards salvaging the problems of unemployment and its attendant consequences that plaque the nation. Commercial motorcycle operation has played significant roles in meeting people's transportation need for transportation most especially in certain strategic locations of urban and rural settlements. It is a common knowledge that motor cycle operators all over Nigeria operate as an entity commonly known as union within the geographical location of operation with enviable objectives which though do not include best practices aimed at ensuring conservation of the operators' health in addition to the fact that no known laws regulates noise levels in the country [4].

This is evident by the that fact that commercial motorcyclists all over Nigeria disregard the essentiality of protective clothing one of which is the protective gears such as mufflers and thus are exposed to high noise levels emitting from their exhaust pipes in excess of 85 dB which can predispose them to hearing loss and its attendant consequences [5].

Commercial motorcyclists within Abia State University, Uturu operate for eight to fourteen hours daily and six to seven days weekly in their bid to make ends meet. They are exposed to prolonged high noise level which remains a cause for concern as they seem not to be aware of the impending acoustic damage [6].

The population of Abia State University students has far out grown the carrying capacity of the hostel accommodation. In this regards, students in a bid to stay close to the campus are left with no option than to rent apartments most of which are not really close enough to the campus in addition to having such road networks that can only be plied by motorcycles. More so, visitors to the university would always choose to patronize commercial motor cycle operators for convenience in locating their destinations. Generally, the demand for the commercial motor cycle among members of the university community and visitors abound basically for convenience and speed thus underscoring the importance of commercial motor cycle within the study area.

Efforts to convince commercial motorcycle operators within the university and environs on the need for use of protective gear while at work by the management of the university and the leadership of their union must be backed up with an evidence based sensitization program an approach which necessitates the need for this study.

Materials and Methods

Consent

The consent of the leadership of the union of commercial motorcycle operators of Abia State University was sought and obtained. Ethical clearance was obtained from the ethical committee of the College of Medicine and Health Sciences, Abia State University, Uturu.

Sampling

Two hundred commercial motorcycle operators within 18-60 years of age were randomly selected for the study. The control group was made up of staff and students of Abia State University Uturu who were age and sex matched and exposed to low noise level. Information was generated from the respondents with aid of a structural questionnaire.

Exclusion criteria

Operators with previous history of ear related problems or at the time of study suffering from hearing loss or receiving treatment to that effect, individuals suffering from blood pressure as well as those who have spent less than 1 year in the vocation and those resident in noise environment were not included.

Hearing screening (Weber test)

This was conducted on each subject of the entire study population with tuning fork of 515 H_z capacity to establish the degree of hearing efficiency.

Evaluation of hearing acuity

Otoscopy was conducted on the study population to ensure that interferences such as the presence of wax or debris in the external ear were ridded off prior to commencement of hearing function test with pure tone audiometer (ABSCO650AA) at the control room of Abia State University, Uturu and results were recorded for air and bone conduction of both left and right ears for air conduction at frequencies of 250H_z, 500H_z, 1000H_z, 2000H_z, 4000H_z, 8000H_3 and 250H_z, 500H_z, 1000H_z 2000H_z and 4000H_z for bone conduction.

Statistical Analysis

Data on noise levels from test and control sources were expressed as Mean ± Standard deviation. Mean values were analysed using student's t-test. P-values less than 0.001 were considered significant.

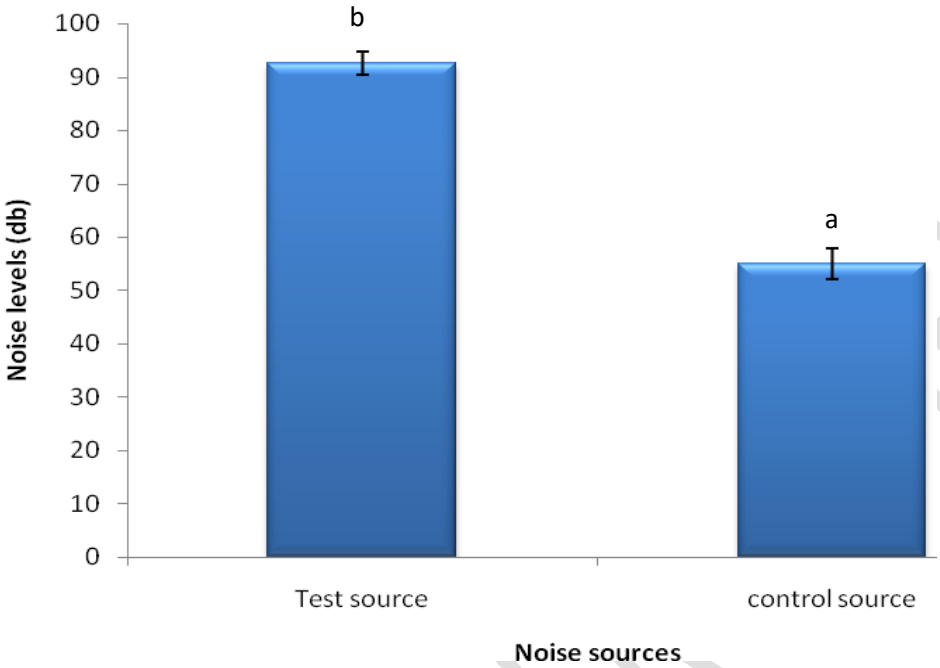

Figure 1: Noise levels generated from test and control sources

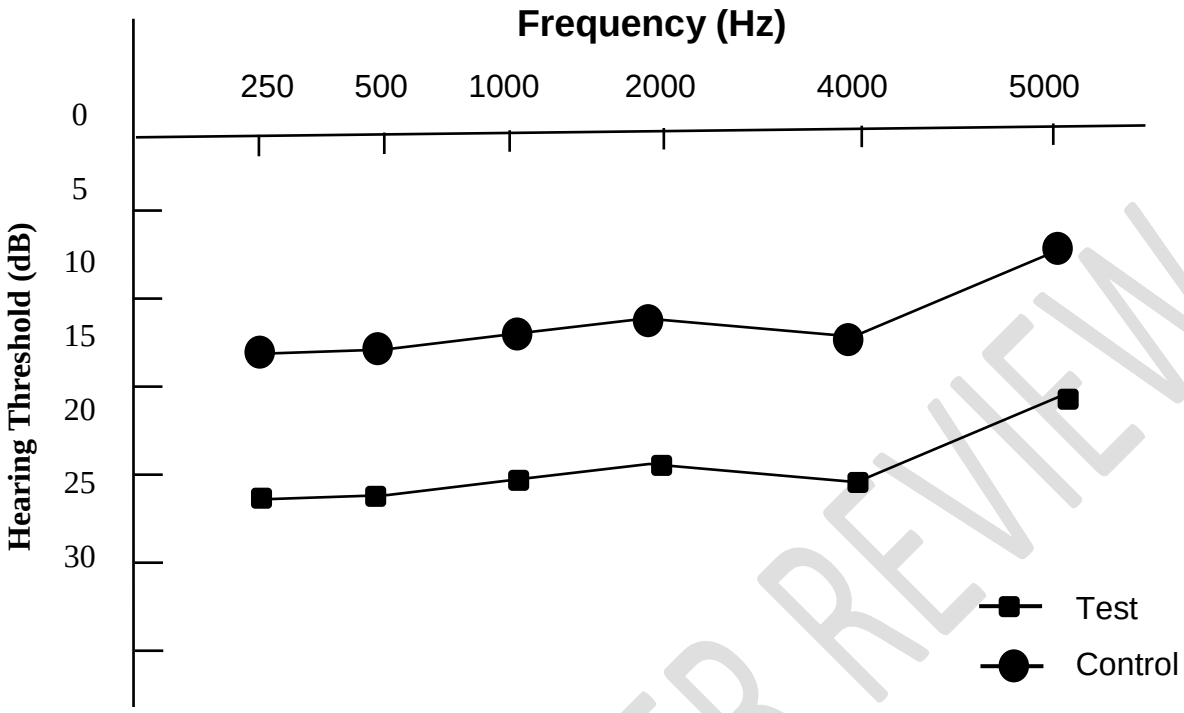

Figure 2: Hearing threshold at varying frequencies for air conduction on left ear

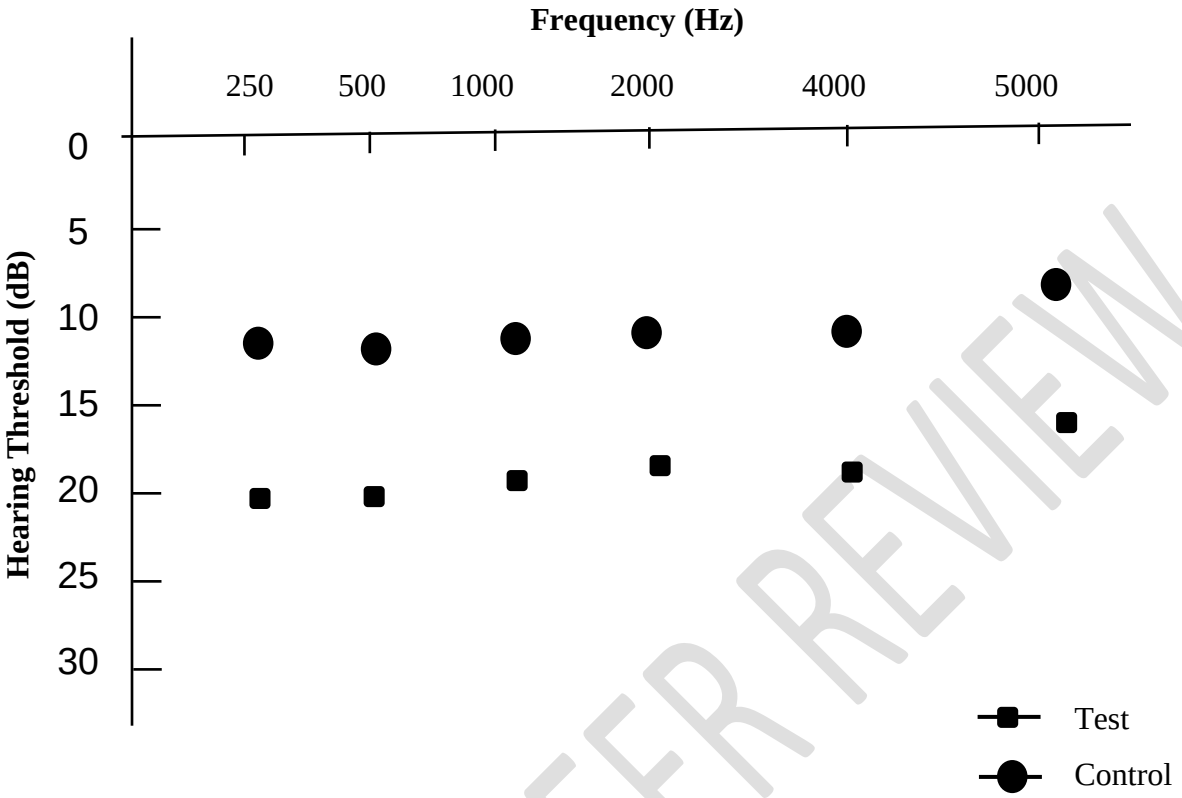

Figure 3: Hearing threshold at varying frequencies for air conduction on right ear

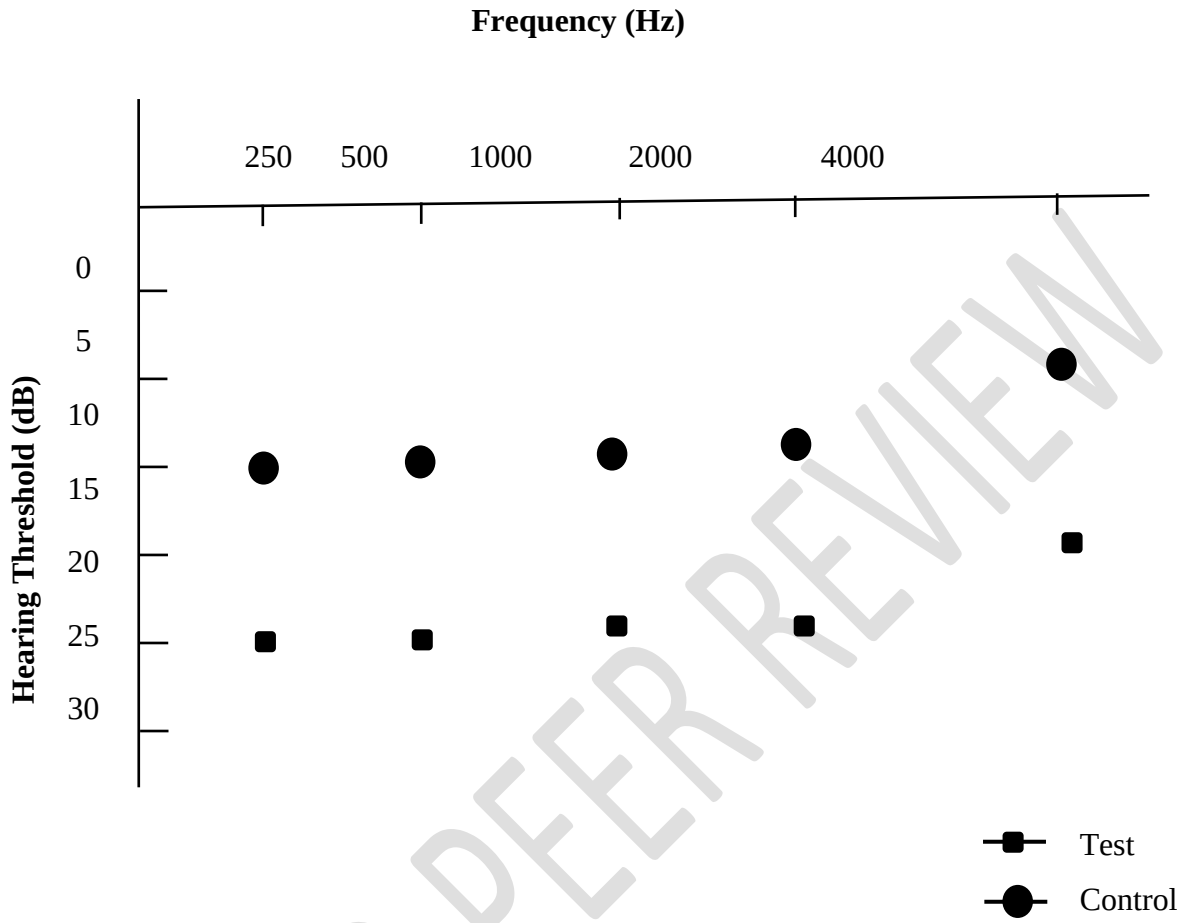

Figure 4: Hearing threshold at varying frequencies for bone conduction on left ear

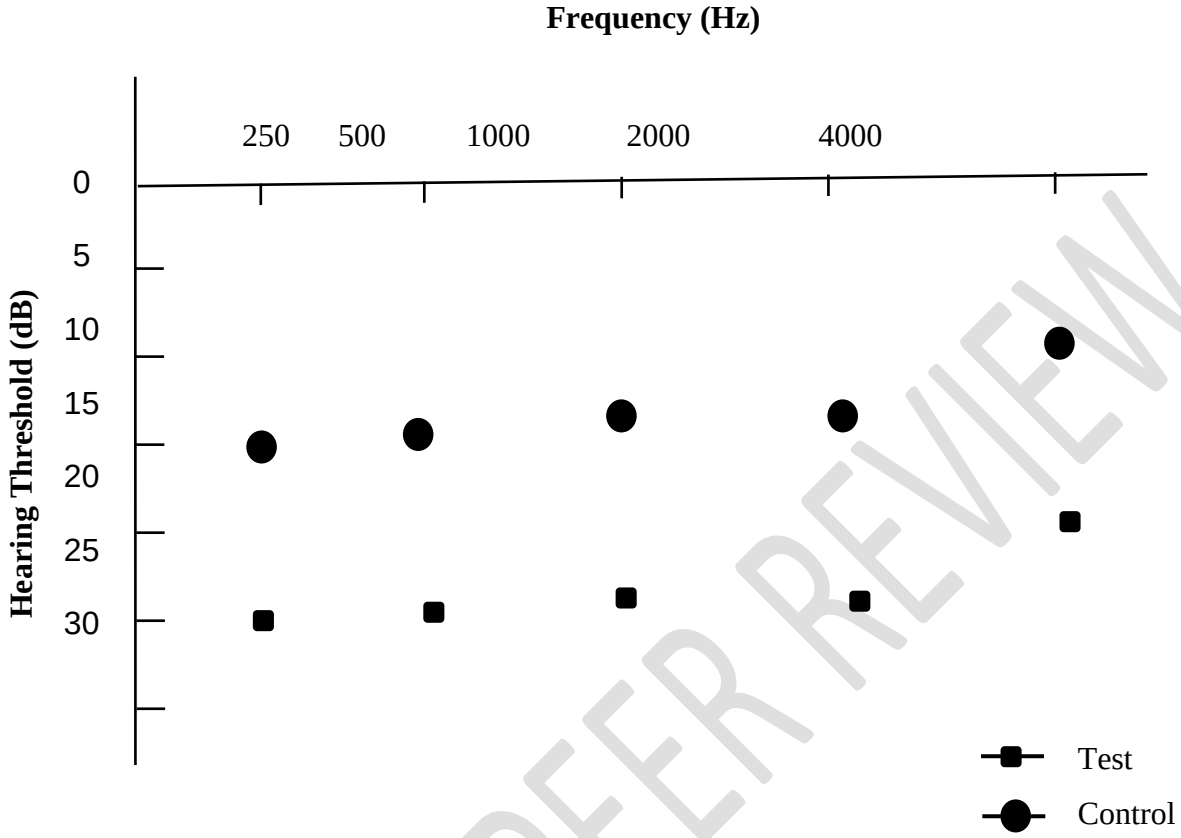

Figure 5: Hearing threshold at varying frequencies for bone conduction on right ear

Table 1: Frequency of occurrence of symptoms associated with exposure to high noise in study populations

Symptoms	Frequency of occurrence (%)	
	Test group	Control group
Insomnia	68	34
Tinnitus	53	26.5
Headache	85	42.5
Body pain	62	31

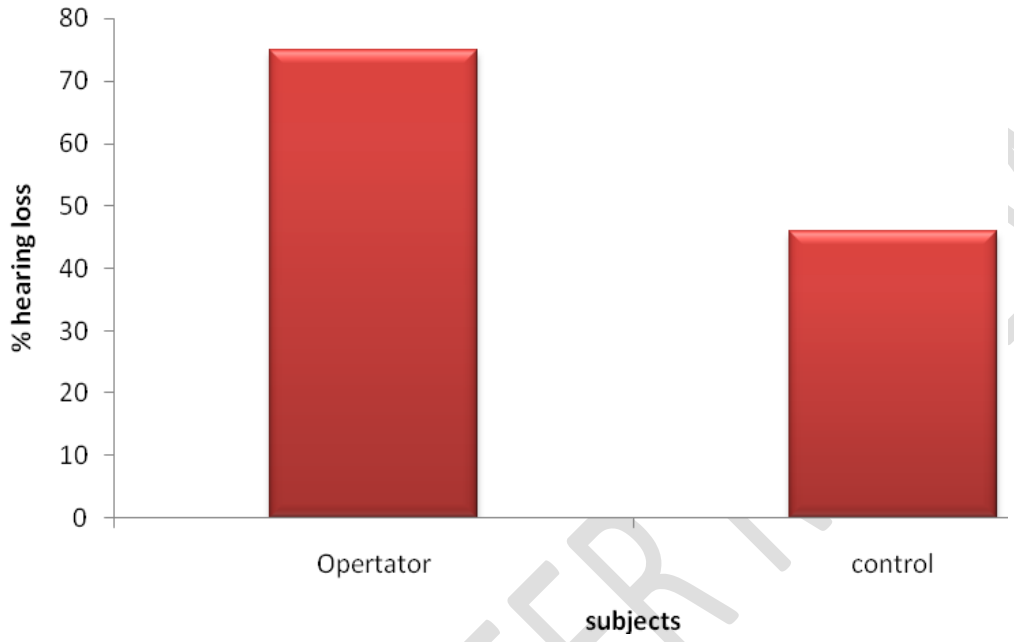

Figure 6: Hearing loss among motorcycle operators at the Uturu campus of Abia State University

Results and discussion

Globally, impairment in hearing resulting from noise has been identified as the most prevalent irreversible occupational hazard with occupational as well as environmental noise being increasing risk factors to this health challenge in developing countries. Figure1 shows the noise levels generated from test and control sources. The mean noise level in the operational areas of the motorcyclists and the control subjects were (92.60±2.1 db) and (55.00±2.8 db) respectively. This noise level is in excess of acceptable healthy noise level of about 80 dB [7]. This could be attributed to the load noise produced from the exhaust pipes of the motorcycles which had had its muzzles removed by the operators for no rational reasons. Figure 2-5 of the study reveal that the hearing threshold of the right and left ears of test group was significantly ($P<0.001$) higher than that reported for the control group at all the frequencies tested for both air and bone conductions. This may be as a result the operators' exposure to noise level in excess of 85 db as research has shown that exposure to noise level above 85 db is likely to damage hearing over time [8]. Figure 6 shows the percentage a 75 % hearing loss among motorcycle operators at the Uturu campus of Abia State University. The 75 % hearing loss recorded on the motorcycle operators could be as a result of the variation in years of service among operators. This result is consistent with work of Abiodun and Isaiah [1] which established diminished hearing sensitivity especially among motorcycle operators who had spent over 5 years in the vocation. The Table 1.0 shows the frequency of occurrence of some symptoms associated with exposure to high levels of noise among study subjects. The study revealed that the frequency of symptoms associated with high levels noise was significantly ($P<0.001$) in the test group (motorcycle operators) compared to their control counterparts. The frequency of occurrence of some symptoms associated with

exposure to unhealthy noise levels was higher among the test population compared to their control counterparts. This may be attributed to the fact that chronic exposure to noise is an an indirect stressor capable of imposing a host of stress-induced scenarios [9]. This is consistent with the finding of Masterson et al [10] which established that the prevalence of tinnitus is higher among adults exposed to occupational noise compared to workers who report no occupational noise.

Conclusion

It was deduced from this study that commercial motorcycle operators within the main campus of Abia State University are exposed to excessive noise with an alarming propensity to predispose them to hearing impairment.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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