

The Association Between Alcoholic Consumption, Visual Acuity and Road Traffic Accident Among Okada Riders in Esan West Local Government Area of Edo State

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Abstract

This study investigates the association between alcoholic consumption, visual acuity function and road traffic accident among Okada riders in Esan West Local Government Area of Edo State. It involves 150 commercial motor cycle riders in the study area. Following standard laboratory procedures and ethics, history of alcohol ingestion and road traffic accident were obtained and visual acuity was examined in each participant who gave informed consent. The result showed that majority of the Okada riders were between 20 and 30 years. Overall, 85.30%, 47.30% and 69.30% respectively reported the ingestion of alcohol, have had accidents and fell below normal range visual acuity. Accident correlates weakly with visual acuity (OR=0.67; $X^2 = 0.289$) but strongly and significant with alcohol ingestion (OR = 2.75; $X^2 = 0.041$). On the other hand, alcohol correlates strongly with poor visual acuity (OR = 2.54). The implication is that Okada riders with poor vision who ingest alcohol are over 2.5 times more likely to have accident compared to Okada riders with good vision. Our findings therefore indicate that poor visual acuity due to alcohol consumption is a risk factor for accidents among Okada riders in Ekpoma.

Keywords

Alcohol Consumption, Commercial Motor Cycle Riders, Visual Acuity, Accident

1. Introduction

Many external factors are known to interfere with visual performance (Anera et al., 2011; Castro et al., 2011; Ortiz et al., 2010; Jiménez et al., 2009) and one of such factors is alcohol ingestion. The consumption of alcohol has been reported to have a negative impact on visual functions (Watten and Lie, 1996; Brown et al., 1975). In line with this fact, alcohol was listed as one of the main causes of traffic accidents (WHO 2009; Peden et al., 2007), hampering many of the daily tasks that require keen vision and full visual performance (Allen et al., 2009). Although its use is often denied, analysis showed that drugs such as alcohol, at time of accident was an important factor in the occurrence of road traffic accident (Asogwa, 1980).

In accordance with several literatures, deteriorations in visual function after alcohol consumption have been the findings (Watten and Lie, 1996; Miller et al., 1986; Adams et al., 1976; Brown et al., 1975). Could the consumption of alcohol therefore be the major cause of the high prevalence of road traffic accident reported in developing countries? For example, in Nigeria it is documented that 1 in 3 and 1 in 9 respectively stand the risk of getting injured or killed from road traffic accident (Ezenwa, 1986). This figure is reported to be subjected to seasonal epidemics (Asogwa, 1978) with greatest impact among the young adult group (Asogwa, 1980; Oyemade, 1973). This is in light of the fact that alcohol is among the most commonly used substances with their life time prevalence rates of 77% among youth (Adelekan et al., 1992).

The detrimental effects of alcohol on human physiology

have well been documented with acute alcohol ingestion affecting many aspects of metabolism, neural function, cardio vascular physiology, thermoregulation and skeletal muscle myopathy (Preddy *et al.*, 2001; Lang *et al.*, 1985; Suter and Shutz, 2008). Functionally, alcohol has been repeatedly shown to exhibit a dose-dependent impairment of balance, reaction time, visual search, recognition, memory and accuracy of fine motor (Burke and Maughan, 2002; Suter and Shutz, 2008; Sainio *et al.*, 1976; Jarvilehto *et al.*, 1975). By implication, pointing towards the direction that alcohol ingestion may be related to the high road traffic accident especially among the Okada riders (commercial motor cycle riders) who are mainly young adult with high potential to be alcohol drinkers. Based on this assertion, it is therefore the aim of the present study to investigate the association between alcoholic consumption and visual acuity function on road traffic accident among Okada riders.

2. Materials and Methods

Study Area: The study was conducted in Esan West Local Government Area of Edo State, Nigeria. The area lies between latitude 60 40° N 60 45° N and longitude 60 05° E 60 10° E (Obabori *et al.*, 2006). However, Ekpoma-the administrative head quarter of the Local Government Area was chosen due to the qualities of this area. Moreso, the area is favoured with dense population of Okada rider probably because the area houses the State owned University (The Ambrose Alli University), several banks, secondary and primary schools and small businesses. These have contributed to the area been transformed from a rural community to a semi-urban area.

Target Population: The target population was the Okada riders (commercial motor cycle riders) in the study area. Okada riders in Nigeria refer to individuals who ride motor bike for commercial purposes and this serves as occupation for them.

Inclusion Criteria: Subjects between the ages of 20 and 40, with no history of eye problems (visual pathology) and or head trauma and normal eye health were included in this study.

Exclusion Criteria: Subjects who use glasses for correction of refractive errors, are above the age of 40 years, and have a history of visual impairment, as well as those who are on medication due to illness were excluded for this study.

Data collection: Data for this study came from two primary sources; a direct interview with questionnaire and physical examination. History of alcohol ingestion was obtained by self-report. Visual acuity screening was carried-out in the open field during the day, using the Snellen's lettered chart. Visual acuity in both eyes and each eye separately was done in line with Smith and Maure (1995), Darling and Thorpe (1975), and Garland's (1995) recommendation. This was measured with a Snellen visual acuity lettered chart. Respondents were tested at standard distances of six metres. The Snellen chart was hung on a wall at a distance of 6 metres at a height of 2 metres. Visual

Acuity was measured in one eye at a time (monocularly) with each respondent standing and facing the chart and then reading out the letters on the charts starting from the biggest one to the smallest readable. The eye not being measured was covered with a hand-held occlude held in place by the researcher. Visual acuity of 6/6-6/18 considered to be normal was classified as good vision while <6/18 - 6/60, <6/60 - 3/60 and less than 3/60 considered as visual impairment, severe visual impairment and blindness respectively (WHO, 1984) were classified as poor vision. Okada riders with poor vision were referred to the eye clinic of the Irrua Specialist Teaching Hospital for further evaluation with a designed referral form.

Data Analysis: Data collected was analyzed for statistics using statistical software package (SPSS version 20). Where applicable, the simple mean and percentages were used while the Chi-square test and odd ratio were performed for significance analysis and measure of association. The results were then presented in suitable tables.

3. Results

The Okada riders who participated in this study were between the ages of 20 and 40. However, they were predominantly between the ages of 20-30 years (84.70%). Table 1 documents the alcohol, accident and visual acuity status of the Okada riders that participated in the study. Overall, 85.30% (n=128) of the Okada riders reported the ingestion of alcohol while only 47.30% (n=71) of the 150 Okada riders have had accident before. In addition, on visual acuity status, 69.30% (n=104) of the Okada riders fell below normal range of normal visual acuity.

Table 1. Alcohol, accident and visual acuity status of Okada riders in Ekpoma.

Variable	Response	Frequency	Percentage
Alcohol Intake	Yes	128	85.30%
	No	22	14.70%
Accident	Yes	71	47.30%
	No	79	52.70%
Visual acuity	Poor/Bad	104	69.30%
	Good	46	30.10%

Table 2 shows the relationship between alcohol consumption and visual acuity and accident among Okada riders. Our results showed that the relationship between accident and visual acuity was a non-significant weak association. It was observed that Okada riders with poor visual acuity are about 1.4 times more likely to be involved in Okada accidents. On the other hand, the relationship between accident and alcohol ingestion showed that Okada riders who consumed alcohol are over 2.5 times more likely to have Okada accident compared to non-alcoholic Okada riders. The relationship between accident and alcohol ingestion was significant among the Okada riders.

Table 2. Relationship between accident and visual acuity and alcohol ingestion.

Variable	Response	Accident		Odd Ratio	Sig
		Yes	No		
Visual acuity	Poor	46	58	0.67	$X^2=0.289$ $p>0.05$
	Good	25	21		
Alcoholic Status	Yes	65	63	2.75	$X^2=0.041$ $p<0.05$
	No	6	16		

Table 3 shows the relationship between alcohol consumption and accident in relation to visual acuity of the Okada rider in Ekpoma. On the relationship between alcohol ingestion on visual acuity and accident, it was observed that Okada riders with poor vision who ingest alcohol are over 2.5 times more likely to have accident. On the other hand, there was no correlation in accident among alcoholic and non-alcoholic Okada riders with good visual acuity.

Table 3. Relationship between alcohol consumption and accident in relation to visual acuity of the Okada rider.

Alcohol ingestion	Visual acuity status						Total
	Poor visual acuity			Good visual acuity			
	Accident		T ₁	Accident		T ₂	
Yes	No	Yes		No			
Yes	40	42	82	25	21	46	128
No	6	16	22	0	0	0	22
Total	46	58	104	25	21	46	150
OR	2.54			0			
P value	p<0.05			1			

4. Discussion

The study showed that majority of the Okada riders in the study area are young adults within the ages of 20 and 30 years. This finding thus suggests that young adults formed a considerable percentage of the economic back-bone of Ekpoma community, the study area. Our finding on the percentage of alcohol ingestion (n=128; 85.30%; table 1) among commercial motor cycle riders in Ekpoma suggest that a large size of this population that forms the economic back-bone consumed alcohol. By indication suggesting that large populations of the economic back-bone are at risk of the potential consequences of alcohol.

Our present study also indicates that there is a high prevalence of accident among commercial motor cycle riders (47.30%) in Ekpoma. Similar but lower prevalence (45.3%) of road traffic accident has been reported among commercial motor cyclists in a rural community in south western Nigeria (Owoaje et al., 2005). Considering that Okada has become a major form of public transportation in most parts of Nigeria, our finding therefore suggests that Okada accident is a public health issue in Ekpoma as this high prevalence means that Okada riders including their passengers are at risk. This high incidence may be due to the predominant young adult within 20 and 30 years in the study. This suggestion is based on the facts from findings conducted in Nigeria, which showed this age group to be at greatest risk of road traffic accidents (Oluwadiya et al., 2004; Umbese and Okukpo, 2001). Moreover, it is a known fact that motor cycle riders are 30

times more likely than car occupants to die in a traffic crash and 8 times more likely to be injured (NHTSA, 2007).

The prevalence of poor visual acuity (69.30%) among the commercial Okada riders observed in this study is very high compared to the 3.3% among commercial drivers in Ife central local government area of Osun state (Oladehinde et al., 2007) and the 3.9% visual field defect amongst drivers in Ibadan (Nwosu, 1991). The difference in visual function status in this study compared to the studies by Oladehinde et al. (2007) and Nwosu (1991) may be due to the difference in the means of transportation. Studies where lower visual impairment was reported are among car driver who are known to be protected from sun, rain and dust that affect motor cycle riders. In support of the high prevalence reported in this study, it has previously been reported that several external factors interfere with visual performance (Anera et al., 2011; Castro et al., 2011; Ortiz et al., 2010; Jiménez et al., 2009).

Of interest in this study is the correlation of alcohol ingestion and visual acuity and commercial motor cycle accident. Our findings showed that accident among commercial motor cycle riders in Ekpoma correlates weakly with visual acuity (OR=0.67; $X^2=0.289$; table 2) but strongly with alcohol ingestion (OR=2.75; $X^2=0.041$; table 2). Studies have showed self-reported visual impairment to be a risk factor for accidents in a study conducted among Ghanaian commercial drivers (Mocketal., 1999). Even at minimum blood levels of 0.05-0.06%, ethanol consumption has been reported to affect several visual functions, such as visual acuity (Watten and Lie, 1996), binocular fusion (steropsis) (Brecher et al., 1955), and latency time for fusion of near and distant objects (Miller, 1991). Thus our finding on the association of alcohol and visual function required further investigation in to the quantity of alcohol ingestion. The finding that alcohol consumption significantly correlates positively (OR=2.75; $X^2=0.041$; table 2) with Okada accident in Ekpoma is in line with the finding by Owoaje et al. (2005), who reported alcohol use to be significantly associated with the occurrence of road traffic accidents among the motor cyclists in a rural community in south western Nigeria. A number of studies have demonstrated a consistent relationship between blood alcohol concentration and the risk of accident (cited in Meskal et al., 2011), thus, our finding is in line.

On the association between alcohol and visual acuity, we observed a strongly correlation among Okada riders with poor visual acuity (OR=2.54). The implication is that Okada riders with poor vision who ingest alcohol are over 2.5 times more likely to have accident compared to Okada riders with good vision. Thus, suggesting alcohol ingestion to be a major factor of Okada accident among commercial motor cycle riders with poor visual acuity. In accordance with this finding, other studies have reported impairment by alcohol as identified important factor influencing both the risk of road traffic accidents and the severity of injuries (Romao et al., 2003; Odero, 1998). Indeed, the finding that poor visual function due to alcohol consumption as a risk factor for

accident is justified considering the laboratory study as cited in Meskal *et al.* (2011), that at relatively low blood alcohol concentration, subjects are significantly impaired regarding vigilance, drowsiness, visual acuity, psychomotor skills and all the function necessary to drive safely. This may be related to the high self-reported accident by the commercial Okada riders in this study considering the also high prevalence of alcohol ingestion by them.

In conclusion, our study showed that commercial Okada riders in Ekpoma ingest alcohol and this may be implicated in their involvement in road accident probably due to visual impairment due to alcohol. Thus, the use of commercial motor cycle by the populace of Ekpoma may place them at risk of morbidity and mortality if no active measures are put in place to discourage alcohol ingestion by Okada riders. In addition, it is recommended that visual acuity screening be conducted for commercial Okada riders by authorities involved before granting them license to ride bikes. The clinical implication is that clinicians take note of the correlate between alcohol ingestion and visual function in accident cases; specifically among motor cycle riders presenting in the hospital. This therefore suggests the professional operational relationship between the Accident and Emergency unit and the Ophthalmology unit of the health system.

Study Limitation: The findings of this study are not without the effect of limitations. These limitations include the small sampled population, likely under-reported or over reported history of accident by the participants due to attrition bias, as well as inadequate logistic mean to determine blood alcohol concentration and have the entire Okada riders in the study.

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