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Alcohol Related Facial Injuries

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Authors' contributions

This work was carried out in collaboration between both authors. Author NA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author EMD managed the analyses of the study and the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

Aim: Consumption of alcohol plays a key role in traumatic injuries The capacity of alcohol to distort human cognitive ability and reasoning makes it an important factor in the causation of motor vehicle and interpersonal violence-related injuries The aim of this study was to investigate the role of alcohol in severe facial injuries in settings of motor vehicular crashes and interpersonal violence.
Study Design: A prospective study of 118 patients who suffered alcohol-related facial injuries.
Place and Duration of Study: The study was conducted at the University of Uyo teaching hospital Uyo, Nigeria over a 5-year period, from January 2007 to January 2021.
Methodology: The variables analyzed included socio demographics, nature of injury and sites of injuries. Alcohol Use Disturbance Identification Test (AUDIT test) was used to identify risks and damages of alcohol use and dependence. Data analysis was done using SPSS version 21.0. Multivariate analysis was carried out using binary logistic regression analysis, P = 0.05 was considered to be statistically significant.
Results: A total of 118 patients suffered alcohol-related facial injuries in the period of the study. There were 97 males and 21 females, giving a male to female ratio of 4:1 The mean age of the patients' population was 43 .The commonest age range involved in alcohol-related facial injuries was 29-38 years. Road traffic injuries were the commonest cause of facial injuries. Medium risk

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alcohol consumption and male gender were identified as risk factors for moderate and severe injuries as well as for avulsive injuries.
Conclusion: Alcohol-related injuries often turn out severe, and the identifiable risk factors include male gender, high-risk alcohol consumption and road traffic crashes.

Keywords: Alcohol; facial injury; AUDIT test; road traffic crash.

1. INTRODUCTION

Alcohol consumption has strong association with facial injuries secondary to motor vehicle accidents and interpersonal violence [1]. There has been an increase in alcohol consumption across all age groups [2], with studies showing that alcohol consumption is associated with certain disease conditions such as pancreatitis, liver cirrhosis, tuberculosis, pneumonia, injuries, malignancies, and psychiatric morbidity [3-4].

Studies suggest high prevalence of alcohol use among male gender, older age groups, and in people with low educational level [5-6]. There is a need to study the alcohol use and correlates it with influence on facial injuries. These cohorts of individuals are also at risk for road traffic injuries and injuries arising from interpersonal violence, and this understanding provides the justification for evaluating the relationship between alcohol use and facial injuries in the exposed population.

Previous studies revealed an increase in drinking-related injury, showing that alcohol consumption increases the likelihood of injury [7-9]. Alcohol intoxication is associated with higher impact speed [10] which leads to higher injury severity [11] and mortality in trauma patients [12] .The relative risk of involvement in a fatal vehicle crash increases with increasing Blood Alcohol Concentration (BAC) of the driver in every age and gender group among fatally injured and surviving drivers [7]. In the USA, alcohol-impaired driving crashes account for nearly 11 000 crash fatalities, or approximately one-third of all crash fatalities [13].

Although the quantity of alcohol consumption has been shown to be more predictive of alcohol-related injury than the frequency of drinking, alcohol overconsumption generally has continued to be a major social problem. Alcohol intoxication leads to neurologic impairment; it can incite violence and aggression as well as render the individual vulnerable to injuries [14]. Alcohol related injuries, especially facial fractures are commoner in young adults. Trauma is often related to the use of alcohol and its abuse has reached massive proportions [15].

Alcohol interferes in cognitive and motor answers, prejudices capability for solving problems in conflict situation. Due to these effects, there is a direct correlation between alcohol consumption and the risk of a person being involved in a dangerous situation that may cause facial trauma, such as car accidents and interpersonal violence [16,17].

The purpose of this study therefore, was to investigate the impact of alcohol use in facial trauma hypothesizing that patients with alcoholism have higher risk and more severe facial injuries.

2. MATERIALS AND METHODS

2.1 Study Design and Area

This was a descriptive study involving 118 patients who were seen at the accident and emergency as well as the oral and maxillofacial surgery department of the University of Uyo Teaching Hospital with alcohol-related facial injuries during a 5 year period from January 2017 to January 2021.

2.2 Study Procedure

Variables analyzed included socio demographics, nature and sites of injuries. Alcohol use was documented when a patient was reported to have consumed alcohol or was injured by someone under the influence of alcohol. Blood alcohol level was not routinely tested, clinical judgment and patient's information were relied upon .Other variables recorded were etiology of injuries, facial regions involved, type of injury, The inclusion criteria for the study were both male and female alcohol users of age ≥18 years who sustained various facial injuries following alcohol consumption. The exclusion criteria were non users of alcohol involved in facial trauma and of age less than 18 years.

Alcohol Use Disturbance Identification Test (AUDIT) was used to identify risks and damages of alcohol use and chemical dependence. The questionnaire was not applied on the day of

trauma because alcoholic intoxication could have interfered in answering the questionnaire. This questionnaire has ten questions: the first three questions measures alcohol intake (amount and frequency of alcohol consumption); the next three refer to alcohol dependence; the last four evaluate recent and past issues associated to alcohol consumption. Questions one through eight is scored from zero to four. Questions nine and ten are scored zero, two or four. The maximum score of AUDIT is 40 and a score equal or greater than ~~8~~ eight means high risk for alcoholism [18].

AUDIT Scale is categorized as follows: 0-7 (Low Risk consumption); 8-14 (Medium risk); 15-19 (High Risk); and > 20 (Dependent) [18].

A score of 1 to 7 suggests low-risk consumption according to World Health Organization (WHO) guidelines. Scores from 8 to 14 suggest hazardous or harmful alcohol consumption and a score of 15 or more indicates the likelihood of alcohol dependence (moderate-severe alcohol use disorder) [18].

2.3 Data Analysis

A simple correlation analysis was used to test the significance of the linear relationship among continuous variables. Analysis was also done using univariate, multivariate percentages and Pearson chi-square tests. For our univariate analysis, the association between socio-demographic variables and alcohol use was determined using Pearson's chi square statistics. Multivariate analysis was carried out using binary logistic regression analysis, using variables that were significant during univariate analysis to determine association with alcohol use. All analyses were by SPSS version 21.0. $p < 0.05$ was considered to be statistically significant.

3. RESULTS

3.1 Socio-Demographic Characteristics

Table 1 shows the socio-demographic pattern of the study. Age range of 29-38 years were more involved in the injuries with a frequency of 38 (32.20%).The other end of the study group (59-68 years) had the lowest frequency 5(4.24%). Also, more males were involved with road traffic accident (RTA) being recorded as the more frequent etiology of the injuries.

3.2 Characteristics of Injury

The characteristics of injuries are shown in Table 2. Semi urban areas had the highest number of patients with the majority of injuries occurring in the evening hours and a frequency of 85 (72.03%). Fractures were the major type of injury closely followed by laceration. Moderate and severe injuries were approximately of equal distribution.

3.3 Level of Alcohol Consumption Risk

Table 3 describes the risk level of alcohol consumption. 53 (44.92%) of the group were high risk consumers of alcohol.

Table 1. Socio-DEMOGRAPHIC characteristics

Variables	n=118	Frequency (%)
Age		
18-28	32	27.12
29-38	38	32.20
39-48	29	24.58
49-58	14	11.86
59-68	5	4.24
Gender		
Male	97	82.20
Female	21	17.79
Etiology of facial injuries		
RTA	67	56.78
Assault	31	26.27
Fall	14	11.86
Sports	6	5.09

Table 2. Characteristics of injury

Variables location of injury	n=118	Percentage (%)
Rural	22	18.64
Semi-urban	6	47.46
Urban	40	33.90
Time of injury		
Morning	24	20.34
Afternoon	9	7.63
Evening	85	72.03
Type of injury		
Fracture	39	33.05
Abrasion	21	17.80
Avulsion	23	19.49
Laceration	35	29.66
Severity of injury		
Mild	16	13.56
Moderate	49	41.53
Severe	53	44.91

Table 3. Level of alcohol consumption risk

Variables	Frequency	Percentage
Low risk	12	10.17
Medium risk	43	36.44
High risk	53	44.92
Dependent	10	8.47
Total	**118**	**100**

3.4 Multivariate Logistic Regression Analysis of Patients with Low Risk (AUDIT SCALE 0-7) Alcohol Consumption

Table 4 shows multivariate logistic regression analysis of patients with low risk alcohol consumption. There is a positive association between male patients and of low risk alcohol consumption. (OR: 1.270, 95%CI: 1.100-2.105.) On the other hand, there is a negative association between this group of alcohol consumption and female patients. This shows that low risk alcohol consumption are found more in males than females and also affects more males. Also there was a positive association between mild injury and low alcohol consumption showing that low alcohol consumption results more in mild injuries.

3.5 Multivariate Logistic Regression Analysis of Patients with Medium Risk AUDIT SCALE (8-15) Alcohol Consumption

Table 5 illustrates multivariate logistic regression analysis of patients with medium risk audit scale (8-15) alcohol consumption. There is a positive association between medium risk alcohol consumption and male patients as well as avulsive injury. This positive association was also recorded in moderate and severe injuries. This shows that medium risk alcohol consumers are liable to have moderate and severe injuries.

3.6 Multivariate Logistic Regression Analysis of Patients with High Risk (Audit Scale 16-19) Alcohol Consumption

Analysis of the relationship with high risk alcohol consumption in table 6 shows that female gender is negatively associated with high risk alcohol consumption. (OR: 0.270, 95% CI: 0.223-0.615). There is a positive association with mild, moderate and severe injuries in this level of alcohol risk consumption.

3.7 Multivariate Logistic Regression Analysis of Patients with Dependent (AUDIT SCALE > 20) Alcohol Consumption

Table 7 shows multivariate logistic regression analysis of patients with dependent (AUDIT

Table 4. Multivariate logistic regression analysis of patients with low risk (audit scale 0-7) alcohol consumption

Parameters	Number (n)	OR	(95% CI)	p value
Male	97	1.270	(1.100-2.105)	0.013*
Female	21	0.360	(0.211-0.513)	0.411
Laceration	35	0.140	(0.030-0.175)	0.542
Abrasion	21	0.092	(0.040-0.176)	0.511
Avulsion	23	2.160	(2.237-4.592)	0.012*
Bone Fracture	39	0.072	(0.020-0.277)	0.523
Mild injury	16	1.090	(2.513-1.671)	0.004*
Moderate injury	49	0.701	(1.212-2.774)	0.522
Severe injury	53	0.009	(0.413-0.661)	0.343

**P=.05. 95% CIs, ORs: The association between parameters and condylar fracture. ORs: Odds ratios; CIs: Confidence intervals, P: P values for all variables*

Table 5. Multivariate logistic regression analysis of patients with medium risk audit scale (8-15) alcohol consumption

Parameters	Number (n)	OR	(95% CI)	p value
Male	97	1.171	(1.251-2.655)	0.003*
Female	21	0.110	(0.113-0.415)	3.810
Laceration	35	0.110	(0.030-0.171)	2.770
Abrasion	21	0.073	(0.030-0.162)	4.211
Avulsion	23	2.270	(2.276-4.622)	0.011*
Bone Fracture	39	1.752	(1.244-3.268)	0.001*
Mild injury	16	0.109	(1.721-3.601)	4.220
Moderate injury	49	1.903	(1.316-2.774)	0.001*
Severe injury	53	2.901	(1.621-3.511)	0.0120*

**P=.05. 95% CIs, ORs: The association between parameters and condylar fracture. ORs: Odds ratios; CIs: Confidence intervals, P: P values for all variables*

SCALE > 20) alcohol consumption .Only laceration and abrasion were recorded as injuries having a negative association between dependence on alcohol and those variables. Avulsion, bone fractures, mild, moderate and severe injuries all had positive association. This shows that the more a patient is alcohol dependent, the more the severity of injuries.

4. DISCUSSION

Alcohol is heavily implicated in facial injuries and alcohol involvement has been associated with more severe facial injuries and greater likelihood for surgical intervention [19].

In this study, patients were predominantly male of younger age .This agrees with a study by Peng S-H, et al. [20] .The gender distribution showed an overall male to female ratio of 4:1 and those in the age group mostly affected were between 29 and 38 years of age.

Some studies gave some reasons why young people currently use alcohol and these includes enhancing sexual pleasure, and to feel more sociable [21]. In traditional society, women hardly drink alcohol because of cultural constraints, they are not economically empowered unlike the male counterpart [22].

In this study, patients with alcohol intoxication were predominantly young men. In addition, patients with high risk alcohol consumption sustained significantly more severe injuries. Studies have shown that alcohol exposure can increase the severity of injury [23]. In this study, we found that to sex, age, GCS and injury region significantly influence the severity of injuries; this implies that the higher mortality of these alcohol-intoxicated patients was attributable to the patient characteristics and associated higher alcohol risk. These results are in agreement with some studies which stated that detrimental effects of alcohol on injury outweigh its beneficial effects [24].

In the current study, fracture was the most common type of injury correlating with severity of the injury. It has been reported that most of the blood ethanol concentration of the victims in case of fatal crash injury by drinking driving ranges between 1 - 2 mg/ml [25]. This may be due to the

Table 6. Multivariate logistic regression analysis of patients with high risk (audit scale 16-19) alcohol consumption

Parameters	Number (n)	OR	(95% CI)	p value
Male	97	1.222	(1.112-2.143)	0.001*
Female	21	0.270	(0.223-0.615)	0.442
Laceration	35	0.230	(0.031-0.173)	0.541
Abrasion	21	0.086	(0.030-0.183)	0.038
Avulsion	23	1.270	(2.126-3.562)	0.002*
Bone Fracture	39	2.033	(1.320-5.438)	0.011*
Mild injury	16	2.809	(2.423-3.341)	0.031
Moderate injury	49	1.513	(1.300-2.544)	0.004*
Severe injury	53	1.170	(3.126-4.552)	0.002*

**P=.05. 95% CIs, ORs: The association between parameters and condylar fracture. ORs: Odds ratios; CIs: Confidence intervals, P: P values for all variables*

Table 7. Multivariate logistic regression analysis of patients with dependent (audit scale > 20) alcohol consumption

Parameters	Number (n)	OR	(95% CI)	p value
Male	97	1.211	(2.101-3.111)	0.012*
Female	21	0.181	(0.223-0.615)	0.542
Laceration	35	0.110	(0.031-0.144)	0.451
Abrasion	21	0.026	(0.030-0.153)	0.121
Avulsion	23	3.270	(2.246-4.782)	0.012*
Bone Fracture	39	2.062	(1.523-3.122)	0.012*
Mild injury	16	2.809	(1.223-3.231)	0.022*
Moderate injury	49	1.903	(1.116-2.332)	0.001*
Severe injury	53	4.210	(2.426-6.652)	0.012*

**P=.05. 95% CIs, ORs: The association between parameters and condylar fracture. ORs: Odds ratios; CIs: Confidence intervals, P: P values for all variables*

impairment of co-ordination or movement, and changes in processing information by alcohol.

Drinking is a strong risk factor for traffic accident according to Matsushita who reported that subjects with drunken driving experience were 30% in men and 8% in women in Japan. In addition, men aged 40-60 years and women aged 30-40 years had higher drunk driving experience [26]. The effect of drinking on driving factors such as reaction time, tracking, attention, watching and driving skills were observed to be extremely low due to alcohol consumption [27].

The multivariate analyses conducted in this study highlights protective and risk factors for alcohol use among dwellers in two semi -urban communities and provide important epidemiological data in terms of identification of a population who require special attention in terms of substance use prevention and intervention programs.

In this, multivariate analysis we found that drinking was associated with younger age, male gender; avulsion and mild injury and were positively associated with low risk alcohol consumption. This shows that low alcohol consumption resulted in minor impact and injuries. Our findings are in line with those of Gureje et al. [5]. These findings are also consistent with alcohol surveys conducted in Togo, a neighbouring country [28], as well as previous studies in Nigeria [29].

Also, the study analysis shows that medium risk alcohol consumption resulted in more severe injuries such as fracture and avulsive injuries. The severity of these injuries consistently increases with both high risk and dependent alcohol consumption showing a positive correlation.

The relative risk of involvement in a fatal vehicle crash increases with increasing alcohol risk of the driver in every age and gender group among fatally injured and surviving drivers, an observation that agrees with a previous study [7]. In addition, a previous study–reported that the mortality rate associated with traffic crashes

doubled in patients with alcohol intoxication as compared to that of sober patients [10]. In the USA, alcohol-impaired driving crashes account for nearly 11000 crash fatalities, or approximately one-third of all crash fatalities [13]. A total of 35.2% of deaths worldwide were attributable to alcohol consumption in 2012, which resulted in 30.8% of disability-adjusted life years (DALYs) from injuries [30].

We also found that more of the study population were medium or high risk drinkers and in rural areas. This is pertinent considering that drinking alcohol is associated with a risk of adverse health consequences such as alcohol dependence, cancers, and injuries, [24,31] and in semirural or rural settings where there is limited access to health care.

5. CONCLUSION

Alcohol-related injuries often turn out severe, and the identifiable risk factors include male gender, medium, high risk and dependent alcohol consumption leading to road traffic crashes.

CONSENT AND ETHICAL APPROVAL

As per international standard or university standard guideline patients consent and ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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