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Evaluation Of The Degree Of Acute Alcohol Intoxication In Subjects Frequenting Snack Bars And Night Clubs In The City Of Douala

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Abstract

Background: Alcohol abuse is classified by the WHO as the third greatest risk of death or disability in the world [1] and is responsible for 9% of traffic accidents [2], due to the high level of motorization in the regions and the relatively easy availability of alcoholic beverages. Unfortunately, this harmful consequence does not only involve the consumer, but also his environment. Thus, in order to prevent the risks of accidents due to acute alcohol intoxication, we set ourselves the objective in this study to determine the frequency of acute alcohol intoxication in subjects frequenting snack bars and night clubs.

Methods: The equipment used was an ethylometer: the Alcometer CA3000, in which, the participants at the exit of the collection sites blew and the values of alcohol level were recorded from the expired air. The time of leaving the collection sites and the means of transport of the participants were also recorded.

Results: 171 male and female motorcyclists, car drivers and pedestrians with an average age of 29.56 ± 6.53 years participated in the study; the average BAC was 2.80 ±3.31g/L; with a prevalence of acute intoxication of 65.50%; the 25-30 age group had the highest level of intoxication (49.54% ≥ 0.5g/L) and young men had a level of intoxication 0.14 times higher than females; furthermore, 66.66% of motorists had a blood alcohol level ≥ 0.5g/L at the time of driving, most often between 10 pm and 1 am; as did 65.60% of pedestrians.

Conclusion: Young men in the city of Douala, aged between 25 and 30 years, very often leave snack bars and/or nightclubs between 10 pm and 1 am in a state of acute alcoholic intoxication; Some of them, despite their state of inebriation take the wheel at the exit of these places, and may be likely to endanger their lives and those of their respective entourage.

1. Introduction

Acute alcohol intoxication is defined by the World Health Organization (WHO) as a state following the intake of a psychoactive substance (alcohol), resulting in disturbances of consciousness, cognitive faculties, perception, behavior, judgment or other psychophysiological functions or organs [3]. It results from the excessive intake of alcohol in a relatively short period of time, and is characterized by the appearance of pathological biological and clinical signs [4], which can go as far as disturbances in the coordination of movements in the intoxicated person. Alcohol consumption is a widespread phenomenon throughout the world and corresponds to a well-established dietary or cultural habit. However, the susceptibility of the consumer, as well as his or her consumption pattern, can constitute a danger both for himself or herself and for the people around him or her, both from the health and socioeconomic point of view [5,6]; because the consequences of alcohol abuse are numerous and are mainly characterized by millions of deaths due to liver cirrhosis and cancers, but also by decreases in professional performance and accidents, especially those of the traffic [7,8].

2012 in France for instance, 58.4% of the nocturnal accidents were fatal and also occurred mostly on weekends and holidays [9].

In Cameroon, since 2000, there has been a steady increase in the number of deaths caused by traffic accidents; the number of deaths per 100,000 inhabitants rose from 27,000 in 2000 to 29,000 in 2015, and 30,200 in 2019. [10]. 10.5% of these deaths are attributable to drunk driving [11].

With this in mind, the WHO has prioritized the protection of the health of the population in the face of the dangers of alcohol abuse, while also giving itself the major objective of preventing and reducing its harmful impacts as much as possible [7]. It is with this in mind that we have undertaken this prospective study, which consists of determining the frequency of acute alcohol intoxication in subjects frequenting snack bars and nightclubs and whether or not they drive after leaving these entertainment venues, to provide decision-makers with data on which they can rely and significantly minimize the risk of road accidents among intoxicated persons (driving or not), through the implementation of related measures, in the city of Douala in particular, and in Cameroon in general.

2. Methods

This cross-sectional, descriptive and prospective study took place in the city of Douala, Cameroon, at the exit of some randomly selected snack bars and nightclubs in different sectors of the city, over a period of six months. Participants in the study were those who frequented these venues and voluntarily agreed to have their blood alcohol levels measured by us.

2.1. Data Collection

A very brief and anonymized questionnaire was administered to the participants, on which information about their ages and gender was collected; then the participant blew into the breathalyzer (Alcometer CA 3000), through a single-use oral hygiene mouthpiece. The Blood Alcohol Concentration (BAC) value displayed on the meter and the time of sampling were immediately recorded. Finally, the behavior of the participants was observed in order to record their various means of locomotion.

2.2. Data Analysis

Was considered acutely intoxicated, any individual with a blood alcohol level above 0.5g/L. The collected data were coded, inserted into Microsoft Excel 2010, exported and analyzed on Epi info 7.3.1.0 and SPSS 20. Chi-square and Fisher tests were used for comparisons and to measure associations. The threshold for statistical significance was set at $p < 0.05$.

3. Results

Out of nearly 896 individuals, only 171 male and female pedestrians, motorcyclists, and vehicle owners actually participated and were enrolled in the study (150 pedestrians, 15 car owners, and 06 motorcycle owners).

3.1. Socio-demographic characteristics

3.1.1 Gender

The following table shows the distribution of the participants according to gender. The 171 participants were made up of 142 (84.03%) men and 29 (16.96%) women

Table 1: Distribution of participants by gende

Gender	Frequency	Percent
Females	29	16,96%
Males	142	83,04%
Total	171	100,00%

and the average age observed of the participants is 29.56 ± 6.53 years; with a minimum of 17 for the youngest and a maximum of 55 for the oldest as presented in Table 2.

3.1.2 Age

The average age observed of the participants is 29.56 ± 6.53 years; with a minimum of 17 for the youngest and a maximum of 55 for the oldest as presented in Table 2.

Table 2: Age distribution of participants

	Minimum	Maximum	SD	Mean	Mode
Age (in Years)	17,00	55,00	6,53	29,56	26,00

3.2. Blood Alcohol Content frequencies

3.2.1 Average blood alcohol level

In relation to the frequency of alcohol consumption, the average blood alcohol level of these participants was around 2.80 ± 3.31 g/l as shown in the table below.

Table 3: Representation of the average blood alcohol level of the participants

	Min	Max	SD	Mean	Mode
BAC (g/L)	0,00	9,99	3,31	2,80	0,00

3.2.2 Blood Alcohol Content (BAC)

Acute alcohol intoxication is defined as a blood alcohol level ≥ 0.5 g/L. Thus, the observation of the frequencies of alcohol consumption allowed us to highlight quite varied and even very high levels of blood alcohol, thus facilitating the determination of the prevalence of acute alcohol intoxication among these individuals; which is about 65.40% as presented in Table 4.

Table 4: Distribution of BAC levels by BAC level

BAC levels (g/L)	Frequency	Percent (%)
[0,00-0,50[	59	34,50
[0,50-1,00[	16	9,36
[1,00-3,00[	38	22,22
[3,00-10,00[	58	33,92
TOTAL	171	100,00

3.2.3 Blood alcohol levels and gender

The proportion of women (51.72%) is greater than that of men (30.99%), for BAC values contained in the sobriety range; beyond this range, the proportions reverse. In addition, the ratio of women's to men's BAC levels for values ≥ 0.5g/l is on average 0.14 and 1.67 for values ≤ 0.5g/l. which means that women have admittedly lower BACs compared to men, but also quite high. (Figure 1)

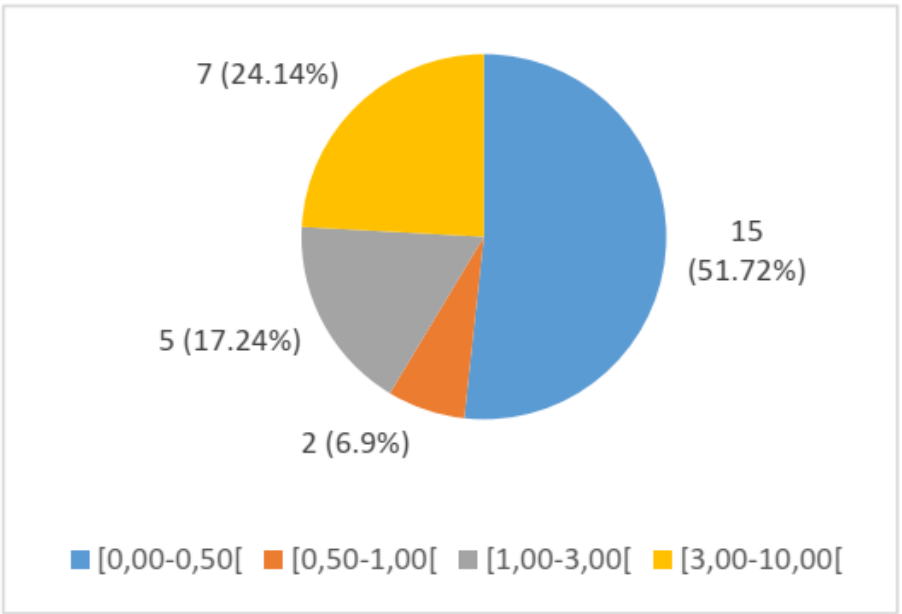

Figure 1: Distribution of blood alcohol levels bygender

Table 5: Distribution of blood alcohol levels by age group

3.2.4 Blood Alcohol Levels and Age

BAC (g/L)	[15-20]	]20-25]	]25-30]	]30-35]	]35-40]	]40-45]	]45-50]	]50-55]	TOTAL
[0,00-0,50[	5	16	22	8	4	2	1	1	**59**
[0,50-1,00[	2	3	8	1	2	0	0	0	**16**
[1,00-3,00[	1	5	19	5	4	3	1	0	**38**
[3,00-10,00[	0	8	29	13	3	3	1	1	**58**
TOTAL	**8**	**32**	**78**	**27**	**13**	**8**	**3**	**2**	**171**

P = 0,555

The 26-30 age group has the highest BAC levels at 50.00% for all BAC values above 0.5 g/L. On the other hand, this same group; has the highest rate of sobriety levels at about 37.28%; the second highest range of high BAC levels is the 31-35 years old.

3.2.5 Blood Alcohol Concentration (BAC) and Time Slots

Table 6: Distribution of blood alcohol levels by time slots

Table 6: Distribution of blood alcohol levels by time slots.

	(BAC Levels (g/L) (% of individuals)				
Time bands (h)	**[0,00-0,50[**	**[0,50-1,00[**	**[1,00-3,00[**	**[3,00-10,00[**	**Total**
[19H-22H[	1 (0,58)	0 (0,00)	0 (0,00)	3 (1,75)	4 (2,34)
[22-1H[	21 (12,28)	10 (5,85)	25 (14,62)	35 (20,47)	91 (53,22)
[1H-3H[	13 (7,60)	4 (2,34)	8 (4,68)	18 (10,53)	43 (25,15)
[3H-5H[	24 (14,04)	2 (1,17)	5 (2,92)	2 (1,17)	33 (19,30)
Total	59 (34,50)	16 (9,36)	38 (22,22)	58 (33,92)	171 (100)

P = 0,0002

It can be seen from this table that the highest BAC levels were recorded in the time period from 10 pm to 1 am. A p-value of 0.0002, below the significance level (p = 0.05), means that there is a statistical relationship between the BAC level and the time of day when people go out to nightclubs and/or snack bars.

3.2.6 Blood alcohol and means of transport

This table (table 7) expresses blood alcohol levels ≥ 0.5 g/L in 53.33% of car owners; and 4 out of 5 motorcycle drivers also had blood alcohol levels above normal; for an average frequency of about 66.66% of intoxicated subjects driving out of snack bars and/or nightclubs.It should also be noted that 66.23% of pedestrians also had a blood alcohol level ≥ 0.5g/L.

Table 7: Distribution of blood alcohol levels by means of transport

	(BAC Levels (g/L) (% of individuals)				
Mode of transport	[0 - 0,50[	[0,50 - 1,00[	[1,00 - 3,00[	[3,00 - 10,00[	Total
Pedestrian	51	16	33	51	151
	(33,77)	(10,60)	(21,86)	(33,77)	(100)
Motocyclist	1	0 (0,00)	1	3	5
	(20,00)		(20,00)	(60,00)	(100)
Motorist	7	0 (0,00)	4	4	15
	(46,66)		(26,67)	(26,67)	(100)
Total	59	16	38	58	171
	(34,50)	(9,36)	(22,22)	(33,92)	(100)

4. Discussion

The objective of our work consisted in the study of the frequency of the acute intoxications related to alcohol among the subjects frequenting the "snack bars" and the "night-clubs". The observation made of the various results thus obtained, allowed us to note certain important aspects:

- The participation rate:

It is quite low, in the order of 19.08% with just 29 (16.96%) women against 142 (83.04%) men, for a total of 171 participants (figure 6); this is mainly due to the skepticism of the populations, not being accustomed for the most part, to submit to such a singular study in the current socio-cultural context;

- Blood alcohol level:

We recorded an average blood alcohol level of about 2.80 g/L (Table 3), and a prevalence of acute alcohol intoxication of 65.50% (Table 4). This result is similar to that obtained by Kimbally-kaky et al. who noted a prevalence of 61.1% during their study on the prevalence of alcohol and tobacco consumption in Brazzaville [12].

- Blood Alcohol Content and age

The environment has a strong influence on the learning of alcohol consumption. In general, the age of the first drink in the family is between 13 and 14 years in Brazzaville for 74% of adolescent drinkers [13], and 12 years for 40% of adolescents in Canada [14]. This could justify the minimum age recorded in our study (Table 5).

The prevalence of acute alcohol intoxication in this study is supported by the blood alcohol levels of the vast majority of participants in the age range 25-30 years (49.54% ≥ 0.5g/l), the 30-34 years old age group is not of the remains

(P > 0.05; Table 5). These results are corroborated by a study made in three cities of France [15], which noted that young people aged 25 to 34 years indulged more in abusive consumption; the socioeconomic status having a real influence on the type and frequency of consumption, given that beer, inexpensive is the essential drink among young people [15, 16, 17].

- Blood Alcohol Content and gender

The results show overall relatively low blood alcohol levels in women compared to men, and a more pronounced sobriety in women (figure 1); they are corroborated by studies conducted by Lammers et al [18], Mezey et al [19] and Mishra et al [20], which showed that women eliminated alcohol more rapidly, due to a more intense activity of ADH. Vaubourdolle et al [21] also estimated that male hormones tend to reduce ADH activity. However, the ratio of female to male BAC levels for values ≥ 0.5g/l is on average 0.14 and 1.67 for values ≤ 0.5g/l. which means that women have admittedly lower BACs compared to men, but also quite high. These results can be explained by the fact that at equal weight and consumption, the blood alcohol level of a woman is 1.2 times higher than that of a man; this is due to the reduced efficiency of alcohol dehydrogenase (ADH), the large fat mass favoring the concentration of alcohol in the organs, the hormonal cycle, the contraceptives [22];

- Blood alcohol level and time

The variables BAC and time slots were dependent on each other (P < 0.05; Table 7).

The highest BAC levels were found between 10 pm and 5 am (Table 7), with a peak in the 10 pm - 1 am time slot. These time slots already belong to the period described by Fell JC et al [23] during which most alcohol-related accidents take place, probably due to high BACs. Furthermore, these time slots would be representative of the times when most people return to their homes or change their place of entertainment.

- Blood Alcohol Content and Means of Transportation

Our results do not show a statistically significant relationship between these two variables (P > 0.05), but they do indicate that 53.33% of car drivers and 80.00% of motorcyclists, i.e. 66.66% of car drivers, had a bac ≥ 0.5 g/l (table 8). these results are similar to those of gjerde et al [24], who had noted that 64.30% of motorists who died in traffic accidents in norway between 2006 and 2008 had a blood alcohol level ≥ 0.5g/l. In contrast, according to Fell JC et al [23], 23% of car owners and 27% of motorcyclists involved in traffic accidents had blood alcohol levels ≥ 0.5g/l in 2009 in the USA. A relatively low participation rate of motorists would explain the difference between the observations made by Fell JC et al and our projections.

Very high BAC levels were also observed among pedestrians (65.60%; Table 8) for values ≥ 0.5g/l), probably because they knew they would be returning home by public transport or getting a ride from a third party.

5. Conclusion and forecast

The evaluation of the prevalence of acute alcohol intoxication throughout our study, allowed us to highlight that young people, of both sexes, following large episodic alcohol consumptions, have varied alcohol values, but especially very high. Moreover, when they leave

the snack bars and/or night clubs, some of them, in spite of their state of inebriation, take the wheel to change the place of entertainment or to go back to their homes at quite late hours of the night. In view of the above and conjecturally, it can be assumed that they (including pedestrians) are likely to be involved in a traffic accident. It would be interesting to evaluate the level of alcohol in the blood as a risk factor or associated factor for road accidents in a study

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