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EFFECT OF ALCOHOL CONSUMPTION ON SOME HAEMOSTATIC PARAMETERS OF ALCOHOLICS IN JOS METROPOLIS

Idoko E.[1], Essien U. C.*[2], Ekwempu A. I.[2], Nyam A. N.[3], Damen J. G[2].

[1]Medical Centre, Enugu State University of Science and Technology, PMB 01660, Enugu State.
[2]Department of Medical Laboratory Science, University of Jos.
[3]Department of Biochemistry, University of Jos.

***Corresponding Author: Essien U. C.**
Department of Medical Laboratory Science, University of Jos.

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ABSTRACT

Background: An alcoholic is one who has an insatiable appetite for alcohol consumption. Excessive, continuous and prolonged consumption of alcohol has been documented to have the potentials to cause many health complications. **Aim:** The aim of this study was to investigate the effect of heavy alcohol consumption on some haemostatic parameters among inhabitants of Jos metropolis, North Central Nigeria. **Material and methods:** The study population consists of 222 alcoholic individuals and 59 non-alcoholics who served as control group. Blood samples (4.5ml) were collected into a specimen container containing 0.5ml of 3.2% tri-sodium citrate for Prothrombin Time (PT) and Activated Partial Thromboplastin Time (APTT) estimation. While 2ml was collected into EDTA specimen bottle for platelet count. The blood samples were immediately conveyed a cooler to the Haematology unit of the Department of Medical Laboratory Science University of Jos where they were processed within 2 hours of collection using standard laboratory methods. The Prothrombin Time (PT) and Activated Partial Thromboplastin Time (APTT) were performed using commercially prepared kits according to manufacturer's instructions (Diagnostic Reagent Ltd, Diagen UK) and test procedures were according to the instructions in the manufacturers' standard operating manual. Data obtained were analyzed using Statistical Package for Social Sciences (SPSS) version 21. **Result:** The mean values of Prothrombin Time (PT), Activated Partial Thromboplastin Time (APTT) and Platelet values for alcoholics were; 18.11 ± 2.87, 53.10 ± 8.65 and 200.87 ± 64.70 respectively. While the mean values of PT, APTT and Platelet of non-alcoholics (the control group) were 15.73 ± 0.78, 45.78 ± 5.65 and 217.08 ± 57.70 respectively. There was statistical significant difference between PT and APTT of test and control groups ($p < 0.05$). However, there was no statistical significant difference in platelet count of test and control groups ($p > 0.05$). We observed a weakly positive correlations between prothrombin time (PT) and Activated Partial Thromboplastin Time (APTT) and duration of alcoholism ($r = 0.205$ and $r = 0.151$ respectively). On the contrary, there was a negative correlation between platelet count and duration of alcoholism ($r = -0.043$). **Conclusion:** We conclude that heavy alcohol consumption can greatly increase the risk of bleeding disorder. Findings from this study can be used to develop policy on effective management of bleeding disorder associated with alcoholism.

KEYWORD: Alcoholic, insatiable**,** Prothrombin Time, Activated Partial Thromboplastin Time.

INTRODUCTION

Alcohol consumption is associated with a risk of adverse health and social consequences related to it intoxicating, toxic and dependence producing properties (WHO, 2014). Alcoholism is a term used in describing an individual's dependence on alcohol, globally it is estimated that about 140million people have history of alcoholism (WHO, 2014). However, the risk for developing alcoholism is influenced by lifestyle and can also be genetically acquired (Alcohol Alert No. 30, 1995). Alcohol consumption is associated with non communicable diseases such as liver cirrhosis and cardiovascular diseases. Alcohol has been reported to have serious consequences on hematopoietic function and clotting cascade (Heermans, 1998). In addition, the association of alcoholism with liver cirrhosis is pointer to its effect on liver enzymes and coagulation parameter (prothrombin time and activated partial Thromboplastin time) (Ejilemele and Orluwene, 2010). However, in the present study we investigated the effect of alcohol consumption on some haemostatic parameters of alcoholics in Jos Metropolis.

MATERIALS AND METHODS

Study Area/population

This study was conducted in Jos North, a local Government Area in the Capital City of Plateau State, North Central Nigeria. Specimens were collected from the inhabitants of Jenta, Tudun wada, and Abattoir all in Jos North Local government area of Plateau State. The study consists of 222 male and female alcoholics of eighteen years and above who were not on any anticoagulant therapy at the time of study, while 59 non-alcoholics served as control group.

Ethical Consideration

Ethical approval was obtained from the management of Jos North Primary Health Care Board. In addition, permission was sought and obtained from the local heads (popularly called "Mai Angwan") of the communities prior to sample collection.

Data collection

After obtaining consent from the participants, structured questionnaires were administered to capture their demographic variable.

Sample Collection and Processing

Six (6ml) of blood sample was collected by clean venipuncture from each individual and 4.5ml was dispensed into 0.5ml of 3.2% tri-sodium citrate contained in specimen bottle and mixed gently and the remaining collected blood sample was dispensed into EDTA sample container for platelet count. The sample was centrifuged for 15 minutes at 2000RPM after which the citrated platelet poor plasma (platelet count<10 X 10^9/L) was obtained and used to determine Prothrombin Time (PT) and Activated Partial Thromboplastin Time (APTT) using manufacturer's instructions on PT and APTT reagents (Diagnostic Reagent Ltd, Diagen UK). The platelet estimation was carried out using standard laboratory method.

Statistical Analysis

Data obtained were analyzed using Statistical Package for Social Sciences (SPSS) version 21. Pearson's Correlation and Analysis of Variance (ANOVA) were used to compare association between variables and $p< 0.05$ was considered statistically significant.

RESULTS

The demographic characteristics of the alcoholics in relation to Prothrombin Time (PT), Activated Partial Thromboplastin Time (APTT) and Platelet (PLT) of study participants is presented in table 1, results revealed that female alcoholics recorded higher mean values of PT; 18.50 ± 3.18, APTT; 54.15 ± 9.41 and Platelet; 219.12 ± 62.37, while their male counterparts had the following PT; 17.99 ± 2.76, APTT; 52.78 ± 8.41 and Platelet; 195.29 ± 64.54. There was no significant difference in the value of PT and APTT among age group of participants ($p> 0.05$), however there was significant difference in the platelet count ($p<0.05$).

Table 2 depicts the result of PT, APTT and Platelet values of the alcoholics (test) and the non alcoholics (control groups). The mean values of PT, APTT and Platelet for test group were 18.11 ± 2.87, 53.10 ± 8.65 and 200.87 ± 64.70 respectively, while the non-alcoholics (the control group) had 15.73 ± 0.78, 45.78 ± 5.65 and 217.08 ± 57.70 respectively. However, there was a statistical significant difference in the values of PT and APTT between the test and control groups ($p < 0.05$), on the contrary, the was no significant difference in the platelet count among the two groups ($p > 0.05$).

The mean values of PT, APTT and platelets counts of participants consuming different brands of alcohol are presented in table 3. There was no statistically significant difference in the values of PT and APTT with respect to different brands of alcohol consumed by individuals ($p>0.05$), except for platelet count where there was significant difference ($p<0.05$).

The relation between PT, APTT, platelet count and duration of alcohol consumption is presented in table 4. There was a significant difference in the PT and platelet count values with respect to duration of consumption ($p < 0.05$), however, there was no statistically significant difference in APTT ($p < 0.05$). Weakly positive correlations were observed in the relationship between the drinking age of the alcoholics and PT ($r = 0.205$) as well as APTT ($r = 0.151$) while no correlation was observed in Platelet ($r = -0.043$).

Table 1: Demographic characteristics of alcoholics.

Demographic variables	Frequency (%) n=222	PT (Sec)	APTT (Sec)	Platelet (Cell x 10^9)
Gender				
Female	52 (23)	18.50 ± 3.18	54.15 ± 9.41	219.12 ± 62.37
Male	170 (77)	17.99 ± 2.76	52.78 ± 8.41	195.29 ± 64.54
p-value		**0.261**	**0.316**	**0.020**
Age				
<= 30	74(33)	18.08 ± 2.94	51.43 ± 6.14	191.97 ± 61.76
31 – 40	68(31)	17.88 ± 2.25	53.21 ± 7.55	197.68 ± 61.39
41 – 50	26(12)	18.15 ± 3.04	55.54 ± 12.49	245.23 ± 60.54
51 – 60	26(12)	18.08 ± 3.33	55.62 ± 10.02	193.15 ± 67.27
61+	28(12)	18.71 ± 3.47	52.64 ± 10.59	198.11 ± 69.34
p-value		**0.796**	**0.130**	**0.006**

Table 2: Distribution of Coagulation Parameters among Alcoholics (Test Group) and Non-alcoholics (Control Group).

	Frequency(%) n=281	PT	APTT	Platelet
Test	222(79)	18.11 ± 2.87	53.10 ± 8.65	200.87 ± 64.70
Control	59(21)	15.73 ± 0.78	45.78 ± 5.65	217.08 ± 57.70
p. value		0.000	0.000	0.081

Table 3: Relationship between Clotting Parameters and the Type of Alcohol consumed by the alcoholics.

	Frequency(%) n=222	PT	APTT	Platelet
Beer	46(21)	17.43 ± 2.89	50.52 ± 6.43	194.35 ± 55.34
Locally made beer	48(22)	18.71 ± 2.98	53.33 ± 9.23	180.90 ± 50.73
Spirit	64(29)	18.03 ± 2.93	52.44 ± 6.22	223.53 ± 65.09
Beer and Spirit	14(6)	17.86 ± 3.98	54.14 ± 8.38	187.57 ± 97.66
Beer and locally made beer	6(2)	18.00 ± 3.10	56.00 ± 12.39	126.67 ± 34.18
All	44(20)	18.36 ± 2.08	55.77 ±11.66	210.86 ± 63.92
F-value		1.031	1.956	4.879
p. value		0.400	0.086	0.000

Table 4: Relationship between PT, APTT, platelet count and duration of alcohol consumption.

	Frequency(%) n=222	PT	APTT	Platelet
≤ 10	40 (18)	17.10 ± 2.42	49.90 ± 6.04	190.20 ± 56.40
11 – 20	82 (37)	17.93 ± 2.69	52.90 ± 7.49	201.00 ± 68.06
21 – 30	46 (21)	18.52 ± 3.17	55.00 ± 9.24	220.39 ± 65.96
31 – 40	30 (16)	18.27 ± 2.39	53.67 ± 9.85	201.60 ± 56.05
41 – 50	16 (7)	19.50 ± 4.20	55.75 ± 12.93	199.50 ± 55.84
≥ 51	8 (3)	18.11 ± 2.05	53.10 ± 10.07	200.87 ± 76.49
p. value		0.043	0.093	0.030
Correlation (R)		0.205	0.151	-0.043

DISCUSSION

The body's haemostatic mechanism can be affected by heavy alcohol consumption. Alcohol consumption poses a major hazard to human health because of its effect on the metabolic processes in the body. This present study focused on assessing some coagulation parameters. We observed that alcohol consumption had a significant effect on PT and APTT values when compared to the non- alcoholics ($p<0.05$). On the other hand there was no significant impact on platelet counts ($p>0.05$). The findings is similar to the report of Erhabor *et al.*, (2014) and Oke *et al* (2015) which stated there was a significant difference between the PT, APTT and platelet values of the alcoholics when compared with the non-alcoholics.

To further buttress our findings Kaufman and colleagues reported in1999 in a study carried out on patients in the United States and Sweden that the baseline incidence of acute upper gastrointestinal bleeding increased by 3-fold as alcohol consumption increased from 1 drink or fewer per week to more than 20 drinks per week.

Regarding the type of alcohol consumed, our study revealed that there is no significant difference in the mean values PT and APTT, but there was a significant difference in platelet counts. This implies that different types of alcoholic drink affects the intrinsic and the extrinsic cascade similarly but affects platelet differently.

Concerning the duration of alcohol consumption, we observed a weakly positive correlations between the duration of alcohol consumption and the values of PT and APTT (($r = 0.205$ and $r = 0.151$ respectively). Erhabor and colleagues in 2014 from Birnin Kebbi, Kebbi State, Nigeria, had a similar finding of a positive correlation between duration of alcoholism and prolonged prothrombin time and activated partial thromboplastin time ($r = 0.46$ and 0.55 respectively. This connotes that the risk of developing a bleeding disorder increases with increased duration of alcohol intake. On the contrary, there was a negative correlation with respect to platelet counts ($r = -0.043$).

CONCLUSION

The effect of alcoholism on coagulation parameters cannot be over emphasized. Hence findings from this study have further supported claims that alcohol intake can greatly increase the risk of bleeding disorder. Sequel to our observations we draw the attention of the Government to enact law or policies regulating the production, importing, sales and consumption of alcoholic beverages as well as initiating programs that

will educate the public on the health implications of alcohol consumption.

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