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ORIGINAL ARTICLE

Prevalence of Hepatitis C Virus Infection and Random Blood Glucose Level Among Students in Nnamdi Azikiwe University, South-Eastern Nigeria

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ABSTRACT

This study investigated the prevalence of hepatitis C virus infection and random blood glucose level among students in Nnamdi Azikiwe University, South-Eastern Nigeria. A total of 100 (38 males and 62 females) apparently healthy subjects aged between 18-30 years were randomly recruited for this study.Rapid diagnostic test was used to screen for anti-HCV antibodies among the subjects whereas, random blood glucose (RBG) level was estimated using glucose oxidase method. Results were subjected to statistical analysis using student t-test and pearson r correlation. Of the 100 volunteers screened, 1(1%) was positive for thevirus while 99(99%) tested negative to the virus. There were no significant difference observed in the mean RBG level of the subjects studied (p=0.947). However, a significant negative correlation was observed between HCV versus RBG (r=0.652; p= -0.046), while other studied parameters had no significant statistical correlation (p>0.05). These observed differences were not statistically significant. The prevalence of Hepatitis C Virus is low among the young apparently healthy undergraduate population in the south - eastern region of Nigeria.

KEY WORDS: *Hepatitis C virus (HCV), Prevalence, infection, Random blood glucose (RBG), Liver, Age, Diabetes Mellitus.*

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INTRODUCTION

Hepatitis, inflammation of the liver caused by viruses, bacterial infections, or continuous exposure to alcohol, drugs, or toxic chemicals, such as those found in aerosol sprays and paint thinners [11]. Inflammation is the painful, red swelling that result when tissues of the body become injured or infected [24]. Inflammation can cause organs to not work properly. Hepatitis can also result from an autoimmune disorder, in which the body mistakenly sends disease-fighting cells to attack its own healthy tissue, in this case the liver [3]. The liver is located in the upper right hand side of the abdomen, mostly behind the rib cage. The liver of an adult normally weighs close to three pounds [6]. No matter what its cause, hepatitis reduces the liver's ability to perform life-preserving functions, including filtering harmful infectious agents from the blood, storing blood sugar and converting it to usable energy forms, and producing many proteins necessary for life [9].The most common hepatitis viruses are types A, B, and C [2].

Hepatitis C virus (HCV) is a small enveloped virus first isolated in 1989 [7] which belongs to the family Flaviviridae [7, 19]. Hepatitis C virus (HCV) genome is composed of a positive-sense, single stranded RNA encoding a polyprotein comprising structural (core and envelope glycoproteins E1 and E2) and non-structural (NS2, NS3a/b, NS4a/b, and NS5a/b) proteins. The core protein forms the nucleocapsid of the virus that encloses the RNA genome [12]. Each virus particle is approximately 55-65 nm in size [14, 20]. The spread is through blood products, secretions, and sexual intercourse. Some groups of people such as health workers, haemophiliacs, homosexuals, intravenous drug abusers and patients on haemodialysis have been reported to be at high risk of hepatitis C infection [8]. The clinical progression of the disease is usually slow and asymptomatic and in most cases it takes decades before severe liver damage occurs [1]. Hepatitis C virus (HCV) causes both acute and chronic forms of hepatitis. After the initial infection, approximately 80% of people do notexhibit any symptom [23]. About 75-85 % of newly infected individuals will progress to chronic disease [21, 23]. Around 20% of infected individuals will develop fibrosis and cirrhosis; of these, approximately 20% will progress to hepatocellular carcinoma (HCC), [21]. In 25 % of all liver cancer patients, the underlying cause is HCV [23].The worsening of the disease is in patients with concurrent HIV infection and/or alcoholic cirrhosis [8]. Antibodies against HCV are usually detectable 6 to 8 weeks post infection [17] and can be detected in acutely and chronically infected individuals [15, 16].

Diabetes mellitus (DM) is a complex non communicable chronic disease including carbohydrate, lipid and protein metabolism disorders (Erin *et al*., 2014). It is characterized by raised blood glucose due to defects in action of insulin, its secretion following progressive beta cells destruction or both [10]. Diabetes Mellitus is currently classified as type 1 Diabetes Mellitus, type2 Diabetes Mellitus, gestational Diabetes Mellitus and other secondary diabetes Mellitus [10]. Therefore, patients at high risk of type 2 diabetes should be identified and screened regularly to avoid late diagnosis with complication. As hepatitis C infection might be a predisposing factor to type 2 diabetes, screening of diabetes in patients with hepatitis C and evaluation of the magnitude of this co-morbidity would be important for evidence based decision making and clinical care [4]. Therefore, the present study assessed the prevalence of hepatitis C and level of random blood glucose among students in Nnamdi Azikiwe University, South Eastern Nigeria.

MATERIALS AND METHODS

Study site

This research was done in College of Health Sciences and Technology, Nnamdi Azikiwe University, Nnewi Campus, Anambra state, Nigeria.

Study Design

This study was designed to assess the prevalence of hepatitis C and level of random blood glucose among students in Nnamdi Azikiwe University, Nnewi Campus, Anambra State, Nigeria. A total of 100 apparently healthy subjects were randomly recruited for this study. A well-structured questionnaire was used to obtain data such as age, presence of any other form of complication and lifestyle of the subjects which will be used as overall index of eligibility. Thereafter, four (4) ml of fasting venous blood was collected and dispensed into appropriate anticoagulant containers. The sample for random blood glucose (2mls) was dispensed into fluoride oxalate anticoagulant container, and properly mixed with the anticoagulant. The remaining 2mls was dispensed into an EDTA anticoagulant container for HCV screening and was properly mixed with the anticoagulant. Thereafter, biochemical parameters were assayed using standard laboratory methods. RBG was estimated using glucose oxidase method as described by Bergmeyer and Bernt, [5], whereas, HCV screening was done using the anti-HCV test kits manufactured by Health-Chem diagnostics, USA. Rapid anti-HCV test kit is a colloidal gold enhanced rapid immuno-chromatographic assay for qualitative detection of antibodies to HCV in human serum or plasma. The kit has a sensitivity and specificity of 100% and 97-99% respectively. The procedure was performed in compliance with the manufacturer's instructions.

Ethical issues and approval

Before the commencement of this study, ethical approval was obtained from the Faculty of Health Sciences and Technology ethical committee, Nnamdi Azikiwe University, Nnewi campus, Anambra State, Nigeria for sample collection. Informed consent of subjects were sought and obtained also.

Inclusion criteria and Exclusion criteria

Apparently healthy students of the College aged between 18 and 30 years old who were willing to participate in the study were recruited while non-students, and Diabetic subjects were excluded from the study.

Statistical Analysis

Statistical package for social science (SPSS version 20) was employed in the analysis of the data collected. The results for parameters studied were expressed as mean±standard deviation and compared between the groups using student's t- test, with level of significance set at $p<0.05$. Correlation of parameters was done using Pearson's correlation.

RESULTS

The prevalence of subjects with Hepatitis C virus (HCV) in the studied population was 1% whereas, those without HCV made up 99% of the studied population (See table 1).

Table 1: Prevalence of Hepatitis C among subjects studied

Variables (n=100)	Hepatitis
Number of students with Hepatitis C	1 (1%)
Number of students without Hepatitis C	99 (99%)

In the present study, the mean age of subjects (males and females) studied were 20.84±2.09 and 21.56±2.34 years respectively, indicating that the studied subjects were from young apparently healthy population. Again, the subjects had a normal RBG. However, there were no significant difference observed in the parameters studied (see table 2).

Table 2: Mean ±SD of parameters studied among students

Variables	Hepatitis C	Random blood glucose (mmol/l)	Age
Males (n=38)	1.00±0.00	4.06±0.59	20.84±2.09
Females (n=62)	1.02±0.13	4.07±0.65	21.56±2.34
t-value	2.524	0.089	0.993
p-value	0.436	0.947	0.122

***Statistically significant at p<0.05.**

There was a significant negative correlation observed between HCV versus RBG (r=0.652; p= -0.046), while other studied parameters had no significant statistical correlation (see table 3).

Table 3:Level of Association between parameters studied

Variables	Pearson r correlation	p-value
Age Vs Hepatitis C virus	0.451	0.076
Hepatitis C virus Vs RBG	0.652	-0.046
RBG Vs Age	0.116	0.249

***Statistically significant at p<0.05.**

DISCUSSION

Hepatitis C virus infection is a major global health problem and occurs among people of all ages, genders, races and world regions. Although, representative prevalence data do not exist in many countries, available data indicate that approximately 3%, of the world's population is infected with HCV [22].

In the present study, there was a 1% prevalence rate of Hepatitis C in the studied population. This observed prevalence is lower than the World Health Organization global prevalence rate of 3% [23] and this may be indicative of a low infectivity of Hepatitis C virus in the study population. This finding is in line with the report of Jemilohun *et al*. who investigated the prevalence of hepatitis c virus antibody among undergraduates in Ogbomoso, South Western Nigeria and found a 0.4% prevalence rate among the studied population [13]. However, this is contrary to the finding of Pennap *et al*. who investigated the prevalence of hepatitis B and C virus infection among people of a local community in Keffi, Nigeria and reported a higher prevalence rate of 13.2% [18].

Interestingly, the subjects had a mean normal random blood glucose level. Although, this was not statistically significant (p=0.947). More so, there was a significant negative correlation observed between HCV versus RBG (r=0.652; p= -0.046), while other studied parameters had no significant statistical correlation (p>0.05).

CONCLUSION

In conclusion, we found a low prevalence rate of 1% of HCV infection in the subjects studied with a normal mean random blood glucose level which correlated negatively with HCV infection.

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