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POTENTIAL RISK FACTORS AND SEROPREVALENCE OF HEPATITIS C VIRUS INFECTION AMONG STUDENTS IN A TERTIARY INSTITUTION IN SOUTHERN NIGERIA.

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Abstract
Hepatitis is a liver disease that is highly contagious. The disease usually results from infection with the virus, Hepatitis C virus (HCV). Infection with Hepatitis C virus is among the major causes of chronic liver disease globally. The infection can begin as acute infection but in some people, the virus remains in the body for a long time, resulting in chronic disease, long-term liver problems such as liver fibrosis and cirrhosis including liver cancers. This study was carried out to determine the prevalence of HCV infection and potential risk factors among students in a tertiary educational institution. A total of 500 apparently healthy University of Benin students with a mean age of 23 + 6 years were screened for HCV antibodies using a rapid lateral visual chromatographic immunoassay kit (WHOBC-Labman, Hamburg, Germany) (serum/plasma) method. A structured questionnaire was used to obtain the student's age and sex including HCV potential risk factors (regular alcohol consumption, smoking habit, sexual life style, skin piercing and history of blood transfusion) indulged in by the students. SPSS statistical package and Chi square version 20 was used for data analysis. The results obtained in the study showed HCV prevalence of 7(1.4%) of the total students. Male students were shown to have higher prevalence of HCV infection 4(1.6%) than the female students 3(1.2%). Students aged 21-24years and 17-20years had the highest rate of HCV infection, 4(1.7%) and 3(2.1%) respectively. Male students were equally observed to have the highest number of indulgence in potential risk factors than their female counterparts. Prevalence of Hepatitis C virus antibody among University of Benin students was 1.4%. Alcohol consumption, smoking and skin piercing are potential risk factors to acquiring HCV infection among students of University of Benin, Benin City, Nigeria.

Introduction

Hepatitis C virus (HCV) is a contagious liver disease that is up to 4 times more infectious than Human Immuno-defficiency Virus (HIV). HCV usually requires less exposure than HIV to cause infection (Te and Jensen, 2010). HCV is among the major causes of chronic liver disease globally (Williams, 2006, Sy and Jamal, 2006). Previous research shows that, the estimated global prevalence of HCV infection is 2.2%, prevalence in Africa ranges between 0.1% and 17.5%; while countries with highest prevalence include Egypt (17.5%), Cameroun (13.8%) and Burundi (11.3%) (Alter et al., 2007). Nigeria is classified as one of the countries highly endemic for HCV infection (Nwokadiuko and Oli, 2008, Oni and Harrison 1999, Halim and Ajayi, 2000). Mutimer et al. (1994) reported HCV prevalence of 20% among sickle cell patients that have received multiple blood transfusion in Benin City; 5% in Lagos (Lesi and Kehinde, 2003); 5% in Ilorin (Adewuyi, 1996). The commonest route of acquiring HCV in Nigeria is the transfusion of unscreened blood or Plasma derived products (Ejiofor et al., 2009). Only about 19% of blood is screened for HCV (anti HCV antibodies) in

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Africa, owing to the high cost of laboratory test kits, inconsistency in screening of blood donors before transfusion, thereby making blood transfusion a major route of HCV transmission in Africa (Karoney et al., 2006). Other possible routes of HCV transmission are through sexual intercourse (Payan et al., 2005) skin piercing or tattoo (Dominguez et al., 2001), vertical transmission (Sun et al., 2001)) and use of intravenous drugs (Gerard et al., 2005)). However, little is known of intravenous drug use as a means of HCV transmission in Africa (Alter et al., 1994). Vertical transmission is significant in setting co-infection with HIV, thus resulting in pandemic proportion of HCV in Africa (Di Stefano et al., 2002). About 170 million people with a 3% global population are living with chronic HCV infection. An estimated 3-4 million new infections occur yearly (Madhava et al., 2002). This estimation makes HCV infection one of the major public health problems worldwide.

This study is aimed at investigating the epidemiology of HCV infection among students residing in the various halls in the University of Benin, Benin City. This is hoped at generating information that could be used to assess the disease trend in the University

Materials/Methods

A well structured questionnaire was used to gather information regarding the student's age, sex and potential risk habits which included how often they consumed alcohol, their smoking habits, sexual lifestyles, skin piercing/tattoos and any history of blood transfusion.

Blood samples were obtained by venipuncture and serum separated and stored at -20^{o}C. The samples were tested for the presence and qualitative detection of HCV antibody using a rapid lateral visual chromatographic immunoassay kit (WHOBC-Labm-an, Hamburg, Germany). The assays were carried out at room temperature. Each pouch was brought out of the refrigerator and allowed to equilibrate with room temperature before testing. The serum was also brought out of the refrigerator for it to also equilibrate with room temperature before testing. The side of the test kit with the arrows pointing downwards was immersed into the serum for 10-15seconds. The maximum (MAX) line on the strip was observed so as to avoid exceeding the line. The strip was then placed on a flat non absorbent surface. The timer was set for fifteen (15) minutes while awaiting a red line to appear or not. Two distinct red lines, one on the control (C) region while the other on the test (T) region. The intensity of the red colour on the test line varies depending on the degree of concentration of HCV in each specimen.

Any shade of red line in the test (T) region as well as in the control (C) region was taken as positive. Red line on the control (C) region and no shade of red colour on the test (T) region was taken as negative.

The data obtained were analyzed using IBM Statistical Package for Social Sciences (SPSS) (version 20) software (SPSS Inc. Chicago, IL USA). Data were presented as percentages, mean $\pm$ standard deviation and frequency tables. Statistical test of association between different variables was also done using Chi-square (X^2) test. P-values < 0.05 were considered significant at 95% confident limit.

Results

The prevalence of HCV infection in the various age groups and gender is presented in Table 1. Of the population

studied (n = 500), 250 (50%) were males and 250 (50%) were females. The age range was from 17years to 29years with a mean age of 23±6years. Most of the students were in the 21-24years age group. HCV infection was detected in 7(1.4%) of the total students studied ($p > 0.05$). In relation to gender, males had higher HCV infection 4(1.6%) while 3(1.2%) females had HCV infection. This was statistically not significant ($p > 0.05$). Also, the highest prevalence of HCV infection 4(1.7%) was in 21years-24years age group while 3(2.1%) was in 17years-20years age group when compared to other age groups. The correlation of HCV infection and age was statistically significant ($p < 0.05$).

Table 1: Prevalence of HCV infection in the various age groups and gender of the study population.

Characteristics	Number examined (%)	Number positive (%)
Gender		
Male	250(50)	4(1.6)
Female	250(50)	3(1.2)
Total	500(100)	7(2.8)
Age group (years)		
<17	5(1)	0(0)
17-20	149(29.8)	3(2.05)
21-24	234(46.8)	4(1.71)
25-28	80(16.0)	0(0)
>29	32(6.4)	0(0)
Total	500(100)	7(3.76)

p-value=0.284

The result presented in Table 2 shows that a prevalence of 3(2.9%) out of the 198(39.6%) students who consumed alcohol regularly were positive for HCV infection. 1(4.7%) out of the 24(4.8%) students involved in cigarette smoking was positive for HCV infection while 1(6.7%) out of the 26(5.2%) students who had skin piercing was positive for HCV infection. Also, 2(1.4%) out of the 227 students with history of multiple sex partners were positive for HCV infection. However, of the 24(9.6%) students who had history of previous blood transfusions, non were positive for HCV infection.

Table 2: Prevalence of HCV infection in-relation to potential risk factors.

Risk factors	Number examined(%)	Number positive (%)
Alcohol consumption		
Males	131(52.4)	2(1.53)
Female	67(26.8)	1(1.49)
Cigarette smoking		
Males	21(8.4)	1(4.76)
Females	3(1.2)	0(0)
Skin piercing/Tattooing		
Males	15(6.0)	1(6.67)
Females	11(4.4)	0(0)
Multiple sex partners		
Males	143(57.2)	2(1.4)
Females	84(33.6)	0(0)
Blood transfusion		
Males	18(7.2)	0(0)
Females	6(2.4)	0(0)

Discussion

Hepatitis C infection is a global health care burden in the world. Hepatitis C infection can begin as acute infection which is a short-term illness that occurs usually within the first six months after someone is exposed to the Hepatitis C virus. Whereas, in some people, the virus remains in the body for a few years, resulting in chronic disease and long-term liver problems such as liver fibrosis and cirrhosis that includes liver cancers. This study was aimed at determining the prevalence of HCV infection and its potential risk factors among apparently healthy students in a tertiary institution in Southern Nigeria.

Of the five hundred (500) students that volunteered to participate in the study, 7(1.4%) were positive for HCV infection. Paul et al., 2007 reported a higher prevalence of 12% in south-western Nigeria while 2.5% were recorded in Maiduguri (Baba et al., 1999). However similar study conducted in Ibadan recorded a prevalence of 1.4% among potential blood donors[21]. Findings from other countries in Africa had a higher prevalence of 17-26% in Egypt (Wasely and Alter, 2000), 2.6% in Cote d Ivoire (Zuccotti, 2006).

In relation to gender, the highest prevalence of HCV infection was recorded among males 4(1.6%) in comparism to female students 3(1.2%). This shows that males harbor HCV infection more than the females. The difference was however, not statistically significant ($p > 0.05$). A similar study conducted among blood

donors in Port Harcourt, also revealed a higher prevalence of HCV infection in males[22].

The highest prevalence of HCV antibodies 4(1.7%) was recorded among 21-24years age group, followed by 17-20years, 3(2.1%) while other age groups recorded a 0(0%) prevalence. Correlation of HCV infection and age was statistically significant ($p < 0.05$). Oni and Harrison (1999) recorded a higher prevalence of HCV antibodies in adults than children. The results in this study is supported by the fact that these age groups are more predisposed to HCV potential risk factors. Results from this study shows that male students who consumed alcohol 2(1.5%) were more predisposed to HCV infection than their female counterparts 1(1.4%). Also, male students who had skin piercing 1(4.8%) and male who smoked 1(6.8%) were more prone to HCV infection than their female counterparts. This work is consistent with research conducted by Conry-Contelena (1996) and Ridzon et al., (1997) respectively who observed that the risk factors highlighted above are predisposing factors to HCV infection.

Conclusion

Prevalence of Hepatitis C infection among University of Benin students was 1.4%. This result shows that male students had higher prevalence of HCV infection than females. This is attributed to the high indulgence in HCV potential risk factors that predispose the male students to HCV infection than the female students. Alcohol consumption, smoking and skin piercing are potential risk factors to acquiring HCV infection. It is recommended that HCV screening should be incorporated into routine medical screening of students as well as enlightenment campaign to students on HCV infection and its potential risk factors, as these will help to detect those harboring the acute HCV antibodies and prevent HCV infection. . It is recommended that HCV should be incorporated into clearance exercise of newly admitted students into the Halls of residence to enable early detection and prompt intervention.

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