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Full Length Research Paper

Survey of Hepatitis B and C among students of Federal University Wukari, Taraba State, Nigeria

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ABSTRACT

Hepatitis B and C viral infection is one of the major global public health problems which are a silent killer in the world. This viral infection has similar means of transmission through body fluid with an infected individual. The aim of this study was to determine the sero-prevalence of Hepatitis B surface antigen (HBsAg) and anti-HCV antibody among students of Federal University Wukari, Taraba State, Nigeria. A total 100 students consisting of 50 males and 50 females within the age range of 15 to 50 years were screened randomly. Rapid diagnostic test kits were used to screen for HBsAg and HCV among the participants. Of the hundred participants screened, 6 (6%) were seropositive and 94 (94%) seronegative for HBsAg, and 6 (6%) were seropositive and 94 (94%) seronegative for HCV. From the 50 males, 6 (12%) prevalence rate was shown for HBV why for the 50 females it was 0% prevalence. Also, from the hundred individuals, with respect to HCV, 5 (10%) and 1 (2%) were seropositive for HCV infection in male and female respectively. In terms of age, prevalence for HBsAg was 4.8 and 11.8% within age 11 to 30 and 31 to 50 respectively while for HCV, a prevalence of 3.6 and 17.6% was recorded within age ranges of 11 to 30 and 31 to 50, respectively. The highest prevalence rate was recorded among the male students with a rate of 12 and 10% for HBV and HCV, respectively. However, there was no record of co-infection of HBV and HCV in this study. The results obtained from this researched implies that students should be encouraged to go for screening and know their status for proper management to avoid cirrhosis and liver cancer and take steps to avoid infecting patients. Hence, for those that are seropositive, early diagnosis, treatment and vaccination are the recommended preventive measures.

Keywords: Survey, Hepatitis B, Hepatitis C, students, Federal University, Wukari, Taraba State.

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INTRODUCTION

Hepatitis B virus (HBV) is a DNA virus of the family hepadnaviridae and is the causative agent of Hepatitis B infection (Pungpapong et al., 2007). HBV is a serious global problem which accounts for about two billion infected cases and 400 million chronic infections worldwide (Bello et al., 2011). The prevalence of chronic HBV infection shows wide regional variation; ranging from high rates greater than 8% found in Africa, Asia and the western pacific, to intermediate rates of 2 to 7% in southern and eastern Europe to low rates of less than 2% in western Europe, North America and Australia (Bukbuk et al., 2005). HBV is also known as serum hepatitis, it is an important form of both acute and chronic viral hepatitis (James et al., 2011). Hepatitis C virus (HCV) is a single stranded RNA virus which until 1989 was named non A and non B. Hepatitis C virus HCV was responsible for 80% of post transfusion hepatitis (Isa et al., 2010). HCV is now recognized as the most common viral infection causing chronic infection of liver diseases among the human population. Recently, HCV prevalence rate estimated by WHO suggests that 3% of the world population are currently infected with HCV which is about

170 million people worldwide (Rinmecit et al., 2010). Several hepatitis viruses are blood borne. The special features associated with both hepatitis B and C is jaundice, liver cancer, and liver damage. HBV and HCV share similar route of transmission which could be through injection or other contact with blood products, heterosexual or homosexual sex. The viral Hepatitis (HBV and HCV) infections are known to occur in the general population. There is no age specificity in the infection and development of the disease (Ayolabi et al., 2006). Current diagnostic antibody assay includes the recombinant immunoblot assay (RIBA) which is more effective at excluding false positive result than previous EIA antibody screening assay. Detection of viral load can be accomplished within days of infection via RT-PCR assay. Viral load assessment is necessary in immunocompromised individuals or for these symptomatic individual who may have false negative antibody result. It is also necessary as a monitoring tool in antiviral therapy (Hoofangle, 1997).

MATERIALS AND METHODS

Study area and population

This study was carried out in the Department of Microbiology, Federal University Wukari, Taraba State, Nigeria. Wukari metropolis is a large town which is the Headquarter of Wukari Local Government Area of Taraba State. Geographically, Wukari lies between latitude 7°55'42" North and longitude 9°47'59" East. It has an area of 4,308 km^2. Wukari is home to Federal University Wukari and Kwararafa University. The major languages spoken are Jukun, Kutep, Tiv, Hausa and Fulani (Ameh, 2014).

Sample collection

Venous blood sample was obtained from students randomly using a dry sterile syringe and needle; the blood is withdrawn from a suitable vein in the arm and the blood sample was slowly ejected into sample tube (EDTA container).

Laboratory analysis

The blood samples were centrifuged at 1500 rpm for 15 min to separate the plasma from the blood. The plasma was used for the screen of HBsAg and anti-HCV and the whole blood was used in the other hand with the addition of buffer.

HBsAg screening

HBV screening was performed using the HBsAg Rapid diagnostic test strip (made in UK). It is a rapid visual immunoassay for the qualitative detection of HBsAg in human whole blood, serum or plasma specimens. For the whole blood, a drop of whole blood was dropped on the test strip with a disposable pipette and a buffer solution (phosphate buffered saline and preservative) was added to the blood on the strip immediately and allowed for ten minutes following manufacturer's instruction. While the plasma/serum 2 to 3 drops were dropped on the pad of the strip with the disposable pipette on provided on the test strip with one drop of buffer. The result was read after 5 to 10 min according to manufacturer's instructtion. Double red lines were visible for positive samples (control and test line), negative samples showed single line (control line).

HCV screening

Samples were tested for the presence of antibodies to HCV using rapid diagnostic test strip (diagnostic UK). HCV rapid test strip is a visual immunoassay for the qualitative detection of antibodies to HCV in human whole blood or plasma/serum specimens. For plasma/serum specimen: 2 drops of plasma and one drop of buffer were added to the sample pad using disposable pipette in the kit. While for whole blood specimen, a drop of venepuncture or finger prick whole blood sample were dropped on the pad and one drop of buffer added. These tests were done following manufacturer's instructions. The result was read within 10 min. This timing allows for complete reaction between the precoated anti-HCV antibodies and the HCV antibodies in the serum. For seropositive samples, two lines appeared on the control and test region respectively while only one line at the control region is seen for sero-negative samples.

Data/statistical analysis

The sero-prevalence of HBV and HCV infection was calculated by using participants with positive sample as numerator and the total number of participant as denominator. The data obtained from this study were presented using descriptive statistics.

RESULTS

One hundred participants, 50 males and 50 females, were used in this study. Of this, 6 (12%) males were sero-positive for HBsAg while about 94 (94% of 100) were sero-negative of the study population (100). This is shown in Table 1. Table 2 shows the distribution of HBV and HCV carriers according to sex and age group. No seropositive recorded for female of all age group for HBV. The highest prevalence for HBV was within age group of 21 to 30, 3(4.7%) and least within age 11 to 21 is 1 (2%). While, HCV has the highest prevalence of 3 (4.7%) within ages 21 to 30 for male and 1 (2%) prevalence in female within age group of 41 to 50. Table 3 shows the distribution of HBV and HCV by weight and sex. Among the males, 25% seropositive HBV were within the weight of 65 to 74 kg, 8.3% within the weight of 55 to 64 kg, while 25% within the weight of 45-54 kg. Among the females 2% within 65 to 74 kg was recorded.

Figure 1 shows the seropositive of HBV with the highest value among ages 21 to 30 in males. Figure 2 shows the distribution of HCV sero-prevalence by age group and sex. Figure 3 shows the distribution of HBV Seropositive by Weight and Sex. Figure 4 shows HCV Seropositive by Weight and Sex. Figure 5a shows seropositive for HBV for male and figure 5b shows seropositive of HBV by age and gender. Figure 6a shows seropositive for HCV for male, figure 6b shows seropositive for HCV for female and figure 6c shows sero-prevalence for HCV by age and gender.

Table 1. Sero-prevalence of HBV and HCV by sex among students of Federal University Wukari.

Sex	No. of sample screened		No. of positive (%)		No. of negative (%)	
	HBsAg	HCV	HBsAg	HCV	HBsAg	HCV
Male	50	50	6 (12%)	5 (10%)	44 (88%)	45 (90%)
Female	50	50	0 (0%)	1 (2%)	50 (100%)	49 (98%)
Total	100	100	6(6%)	6(6%)	94(94%)	94 (94%)

Table 2. Sero-prevalence of HBV and HCV by age group among students of Federal University Wukari.

Age group	Male	Female	Male no. positive%		Female no. positive%	
			HBV	HCV	HBV	HCV
11-20	10	9	1 (10%)	0 (0%)	0 (0%)	0 (0%)
21-30	27	37	3 (11.1%)	3 (11.1%)	0 (0%)	0 (0%)
31-40	10	3	2 (20%)	0 (0%)	0 (0%)	0 (0%)
41-50	3	1	0 (0%)	2 (66.7%)	0 (0%)	1 (100%)
Total	50	50	6 (12%)	5 (10%)	0 (0%)	1 (2%)

Table 3. Sero prevalence of HBV and HCV with weight.

Weight group (kg)	Male	Female	No. of positive male		No. of positive female	
			HBsAg	HCV	HBsAg	HCV
35-44	1	4	0 (0%)	0 (0%)	0 (0%)	0 (0%)
45-54	8	31	0 (0%)	2 (25%)	0 (0%)	0 (0%)
55-64	24	13	2 (8.3%)	0 (0%)	0 (0%)	0 (0%)
65-74	16	1	4 (25%)	3 (18.8%)	0 (0%)	1(100%)
75-84	0	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)
85-94	1	0	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	50	50	6(12%)	5 (10%)	0 (0%)	1 (2%)

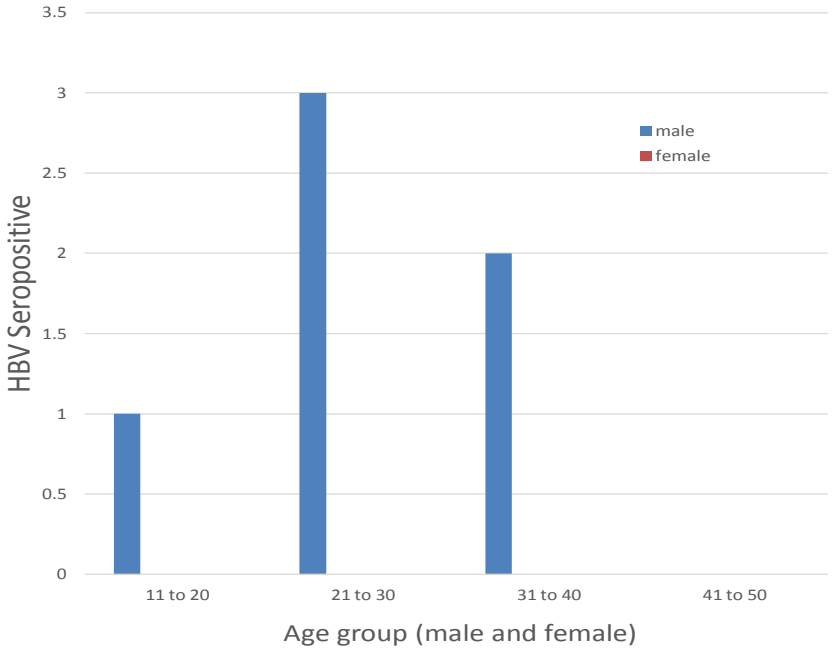

Figure 1. Bar chart showing the distribution of HBV carrier by sex and age group.

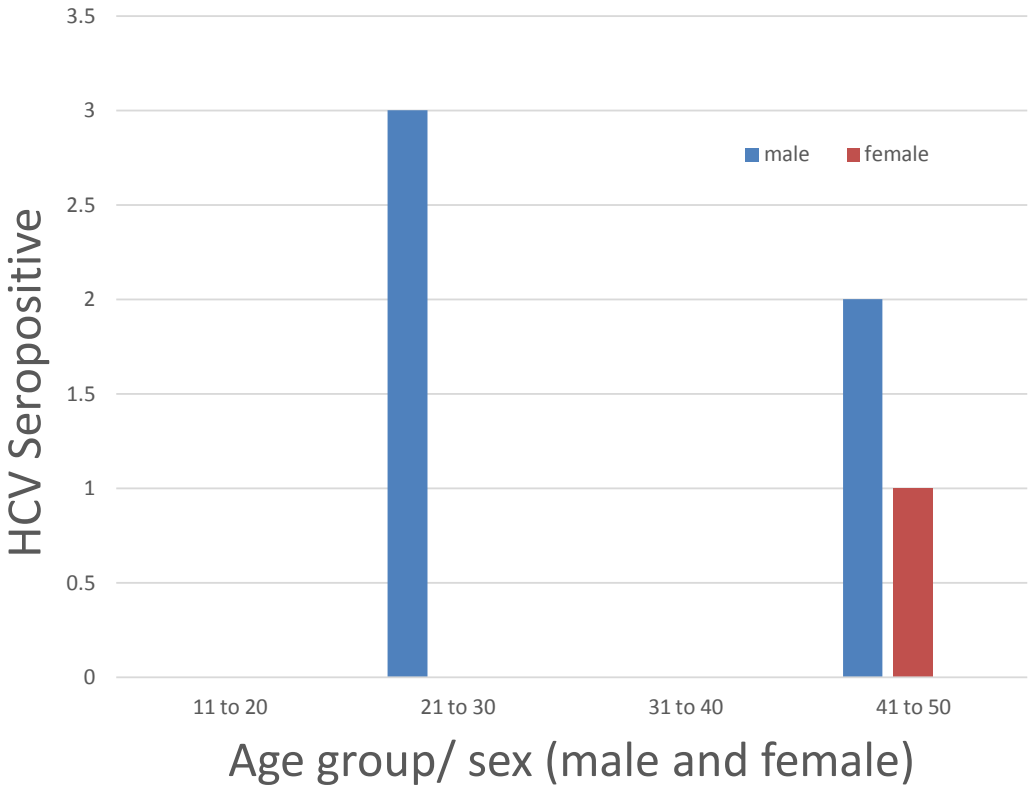

Figure 2. Bar chart showing the distribution of HCV seroprevalence by age group and sex.

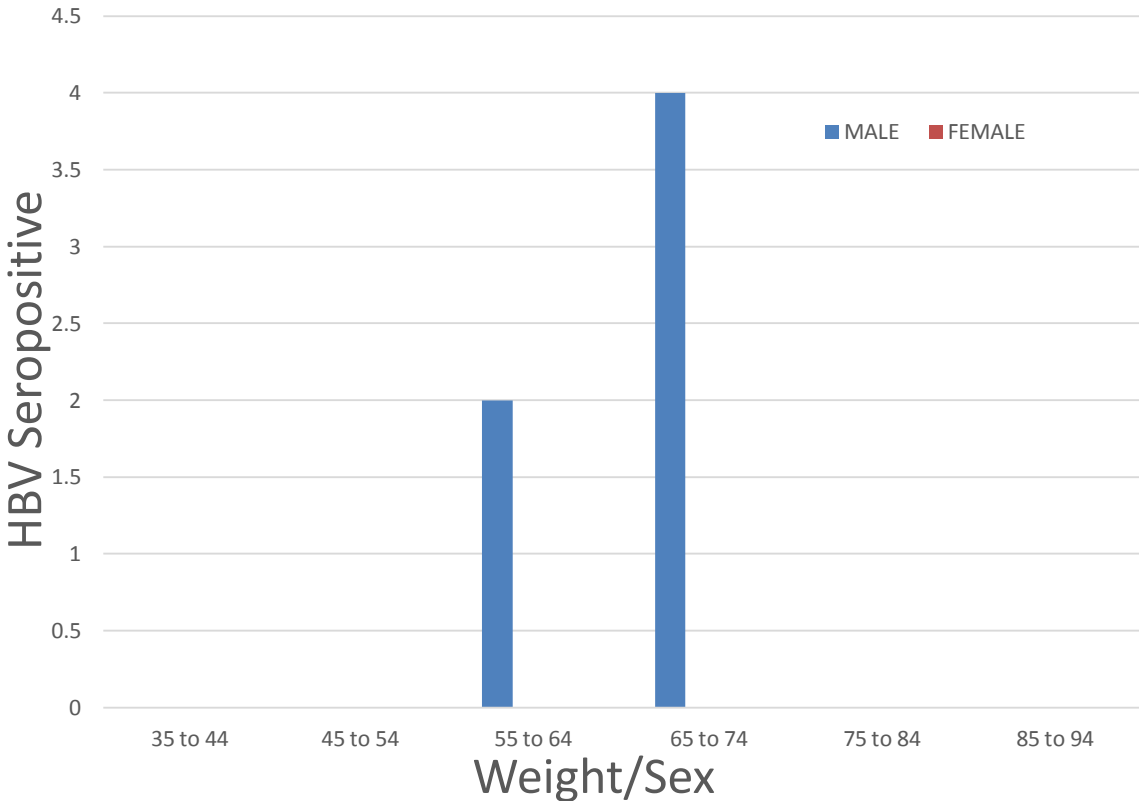

Figure 3. Distribution of HBV seropositive by weight and sex.

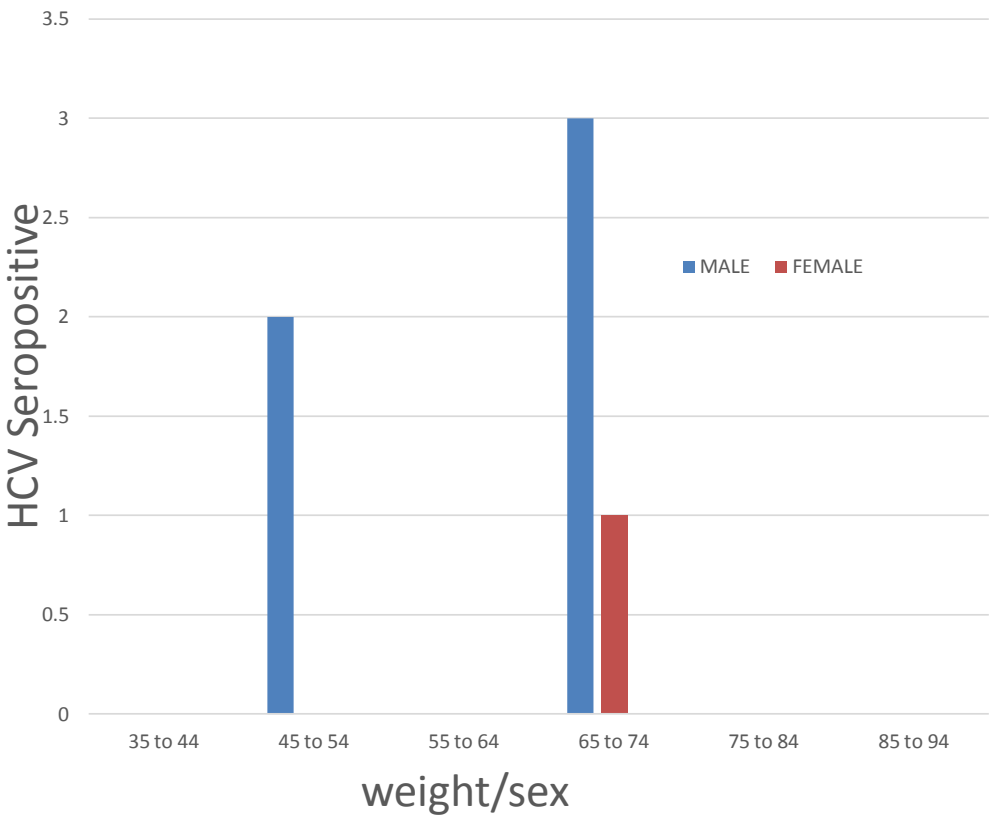

Figure 4. Distribution of HCV seropositive by weight and sex.

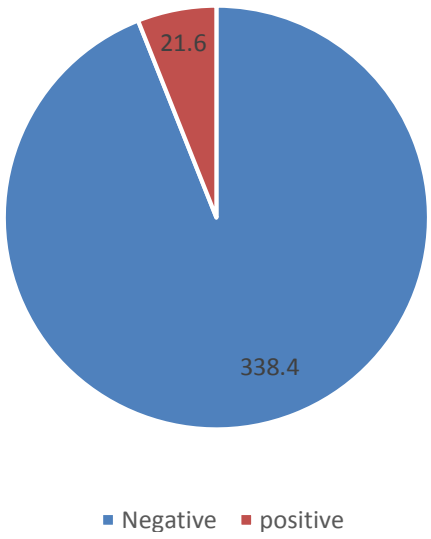

Figure 5a. Pie chart for seropositive for HBV for males.

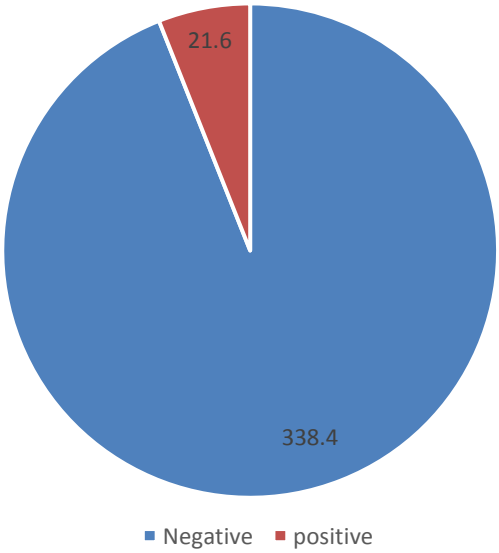

Figure 5b. Pie chart of seropositive of HBV by age and gender.

DISCUSSION

In this research, an overall sero-prevalence rate of 6.0% for HBsAg was recorded during the study period; a sero-prevalence rate of 6.0% was recorded for anti-HCV with no case of co-infection. The 6.0% for HBV in this study is higher than that of Mboto and Edet (2012) which had a prevalence rate of 4.7% among students in University of Uyo. Pida and kagimu (2005) recorded a prevalence of

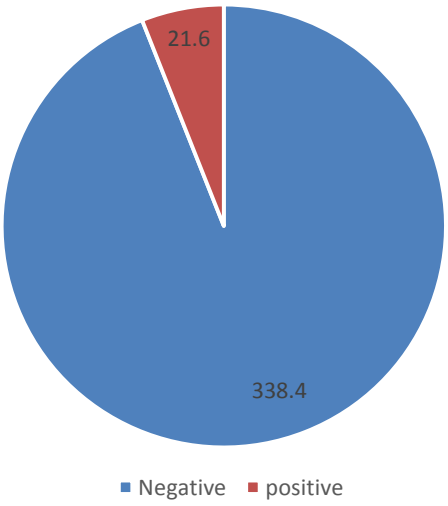

Figure 6a. Pie chart of seropositive for HCV for males.

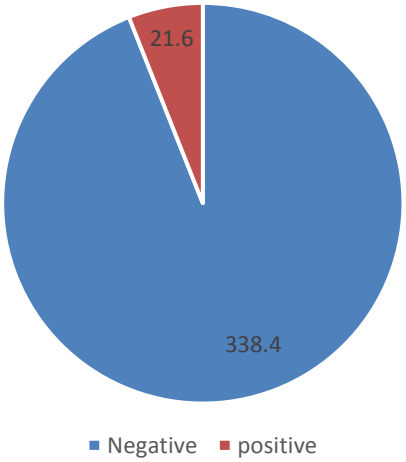

Figure 6c. Pie chart of seroprevalence for HCV by age and gender.

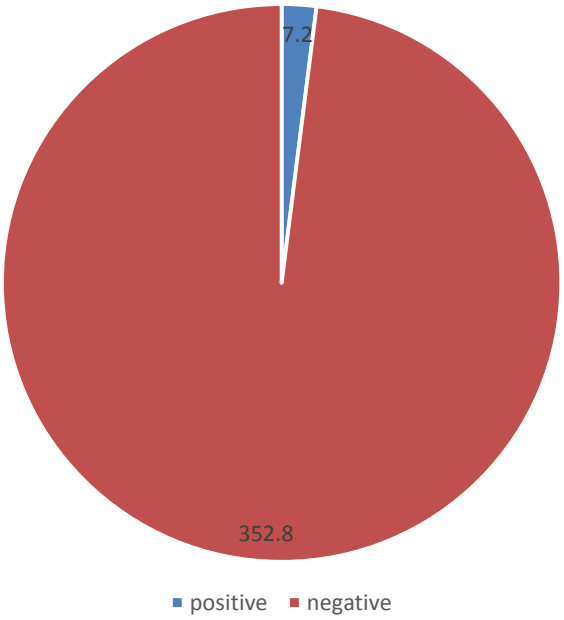

Figure 6b. Pie chart of seropositive for HCV for females.

11.0% among medical students of Makerrere University Uganda. In ABU Zaria, prevalence rate of 12. 5% was recorded among students (Aminu et al., 2013), prevalence rate of 12.8% in Maiduguri, 11% in Makurdi (Musa et al., 2015). In the University of Ilorin, 8.0% prevalence rate was reported by Udeze (2015). This prevalence rate of 6.0% for HBV in this research falls below the category of high endemicity which states 'high endemicity for HBV infection as HBsAg values is greater than 7% in an adult population' (Uneke, 2005). This classification does not support the report for Nigeria as highly endemic area with prevalence greater than 8% (WHO, 1990). The 6.0% sero prevalence for HCV in this research work is higher than the 3.0% worldwide sero-prevalence reported by world health organization in 1999 and also higher than the 5.3% reported for the whole African region by WHO and a lower prevalence of 2.0% among the general population of Nigeria (WHO, 2013). The prevalence of HBV and HCV differs in or varies in different population groups (WHO, 2005). The prevalence of 0.6 to 2% was reported in western countries and ≤15% in other regions of the world (WHO, 2013). African blood donors have been reported with estimated prevalence of 6.0% compared to 0.5 – 15% seen in blood donors in Europe and North America (Ezeani et al., 2006). This present research recorded a significant incidence of HBV and HCV infections amongst students in Federal University Wukari in Nigeria. In this study, the prevalence of hepatitis B was higher within male of age 21 to 30 (3, 11.1%) while that of HCV was higher within age group of 41 to 50 (3, 75%) and 21 to 30 (3, 75%). Others studies shows that the prevalence of HCV is much higher in older adults than in young adults and when compared with previous studies, a higher prevalence among young adult aged 15 to 29 years while this study have a rate among the young for age 21 to 30 and older adult have higher rate of 3 (75%) within ages 41 to 50 (Okonko et al., 2012).

CONCLUSION

Although much is known about the epidemiology of HBV and HCV in Nigeria, limited investigations have been carried out on HBV and HCV in some parts of the country. Studies carried out by various authors have shown that HBV and HCV infections are highly prevalent among Nigerians. The result of this study which shows that the prevalence of HBC (6%) and HCV (6%) which is

high when compared with the study population shows that many of these students do not know much about hepatitis viral infection, mode of transmission, vaccination, treatment, prevention and control hence the high prevalence rate recorded in this study population. As a result of this, there is need for adequate screening programme to reduce the transmission of infection. Public awareness programme to educate the students on modes of transmission should be put in place for HBV vaccination because many of the students are not aware of the infection and its mode of transmission, some are afraid of taking vaccine for various reasons such as religion which in this part most people still believe that the use of drugs is against their religion. Therefore, in order to reduce HBV and HCV infection, mass immunization of adults and antiviral drugs should be provided for those that are infected, while HBV and HCV screening programs should be instituted in all higher institution in the country to reduce the prevalence rate and level of transmission of the hepatitis virus.

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