academicJournals

Vol. 10(3), pp. 77-86, March 2018
DOI: 10.5897/JPHE2017.0995
Article Number: CC4B67456030
ISSN 2141-2316

http://www.academicjournals.org/JPHE

Journal of Public Health and Epidemiology

Full Length Research Paper

Epidemiology of Hepatitis B viral infection among students and non-teaching (casual) staff of Nile University of Nigeria: A 2017 study

Zainab Y. Lado, Chukwuma C. Ogbaga* and Onyinye F. Nwagbara

Department of Biological Sciences, Biotechnology and Microbiology, Nile University of Nigeria, Jabi Airport Road Bypass, Abuja, Nigeria.

Received 21 December, 2017; Accepted 25 January, 2018

Hepatitis B viral infection is a silent deadly disease. According to the Society for Gastroenterology and Hepatology in Nigeria (SOGHIN), over 20 million persons are infected with hepatitis and death from it is on a large scale. This study was carried out in order to estimate the prevalence of Hepatitis B Virus (HBV) among students and non-teaching staff of Nile University of Nigeria, Abuja. The study was cross-sectional; involving 200 participants (150 students and 50 non-teaching staff) recruited over a period of three months, from the first week of February 2017 to the end of May 2017 and screened for Hepatitis B surface antigen (HBsAg) using One Step Rapid Diagnostic Test. Structured questionnaires were also issued out to the study population. The study revealed that 13 out of the 200 people tested were positive giving an overall prevalence rate of 6.5% (95% CI: 3.0, 10.0%). 3 out of the 150 students were positive and 10 out of the 50 non-teaching staff tested were positive. The prevalence of HBsAg was higher among the non-teaching staff (20.0%) than among students (2.0%). Disaggregated by gender, the prevalence was higher among males (8.9%) than among females (4.0%). The reasons for the difference in prevalence and health implications of these findings are discussed.

Key words: Hepatitis B virus, gastroenterology, students, non-teaching staff, prevalence.

INTRODUCTION

Hepatitis B viral (HBV) infection is a life threatening infection of the liver. It is a major global health problem and people are largely unaware of this disturbing medical issue (World Health Organization (WHO), 2016). Although this infection was discovered more than 50 years ago and a safe and effective vaccine has been available for more than 20 years, the complications of chronic HBV infection remain the cause of significant illness and death in Africa (Emechebe et al., 2009; Davis, 2016; WHO, 2016; Schoenstadt, 2017; Afihene et al., 2015). It is therefore essential to increase the knowledge base and awareness of this clinical entity. Current literature has established that the risk of contracting Hepatitis B virus is about 50 to 100 times higher than that

*Corresponding author. E-mail: chukwumaogbaga@gmail.com. Tel: +2349030333632.

of Human Immunodeficiency Virus (HIV) because Hepatitis B virus has a higher degree of infectiousness (Centers for Disease Control and Prevention (CDC), 2016). Fortunately, hepatitis B can be prevented, as there are vaccines available unlike Human Immunodeficiency Virus (HIV) that cannot be prevented with vaccines (Baruch, 2015).

Hepatitis simply means injury to the liver with inflammation of the liver cells (Davis, 2015). Not all forms of hepatitis are infectious. Consumption of alcohol, certain drugs and chemicals may have adverse health effect such as liver inflammation, as they are bad for the liver. Infections as well as autoimmune diseases, genetic problem or a metabolic disorder could also cause inflammation of the liver. Obesity can lead to liver damage also causing inflammation. These forms of hepatitis are non-infectious as they cannot spread or be transmitted from one person to another (Davis, 2015). Viral hepatitis is a group of infectious diseases known as hepatitis A, B, C, D, and E (Davis, 2016). These are the five main types of hepatitis, which are caused by viruses. A group of DNA viruses' known as Hepatitis Viruses A, B, and C are the major causative agents of hepatitis virus, responsible for most liver damage. The hepatitis virus is found in the blood and body fluid of infected individual and is transmitted from person to person (Nettleman, 2016).

Hepatitis A is caused by consuming contaminated food or water. It does not cause chronic liver disease and is rarely fatal, but can cause serious symptoms. It can be prevented through improved sanitation, food safety and vaccination (Davis, 2015). There is no specific treatment for hepatitis A. Most patients recover spontaneously and are advised to refrain from alcohol and drugs during recovery (Davis, 2015).

Hepatitis B can cause both acute and chronic infections. Hepatitis B is an acute form of hepatitis transmitted by blood, sexual contact, and body fluids and from mother to child (perinatal transmission). The majority of hepatitis B infections do not show symptoms initially, increasing the risk of people transmitting the infection without knowing (Weinbaum et al., 2008).

Hepatitis C is spread via direct contact with the blood of a person who has the disease. It is very common especially in Asia and Africa where most infections are caused by unsafe medical injections and other medical procedures (WHO, 2016). Antiviral medicines can cure approximately 90% of people with hepatitis C, thereby reducing the risk of death from liver cirrhosis and cancer (WHO, 2016). There is currently no vaccine for hepatitis C but research on this is ongoing (Davis, 2016). A person can only become infected with hepatitis D if they are already infected with hepatitis B because the hepatitis D virus is an incomplete virus that can only replicate in the presence of hepatitis B virus. Getting vaccinated against hepatitis B can prevent it. So far, no effective treatment for hepatitis D is available (WHO, 2016). People become infected with hepatitis E by drinking contaminated water (WHO, 2017). Hepatitis E usually clears in 4 to 6 weeks, so there is no specific treatment. However pregnant women infected with hepatitis E are at considerable risk of mortality from this infection. Hepatitis E vaccine has been developed and is licensed in China but it is not yet available everywhere (WHO, 2017). Hepatitis A and hepatitis E usually resolve on their own while hepatitis B, C and D can become chronic and very serious and have to be treated. No vaccines are available yet for hepatitis C and D, reducing exposure offers the best protection against infection (National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), 2012).

The main focus of this research is hepatitis B. According to Baruch (2015), 10-30 million people will become newly infected each year and approximately 2 people die each minute from hepatitis B. In addition, about 95% of people with hepatitis do not know they have it (Clerkin, 2016). More than 686,000 people die every year due to complications from hepatitis B, including cirrhosis and liver cancer (WHO, 2016). Liver cancer caused by hepatitis B is the major cause of cancer in women and ranked among the first three causes of deaths in men. Majority of people infected with hepatitis B virus rarely display any symptom although they can still transmit the virus to other people. Early identification of infected persons with the help of blood tests is very important in breaking the chain of transmission as well as starting necessary treatment with antiviral medications (Nguyen et al., 2007).

The identification and vaccination of those individuals that share household with infected persons as well as their sexual partners is also very significant. The initial phase is called the acute phase, which usually lasts less than 6 months and is usually not dangerous (Weinbaum et al., 2008). The symptoms if present are like a mild flu and may include; diarrhea, fatigue, mild fever, nausea, vomiting, loss of appetite, slight abdominal pain and weight loss (Davis, 2015, 2016). But if it persists longer than that, it becomes chronic with complications (Weinbaum et al., 2008). As it gets worse, the symptoms include; dark urine, dizziness, headaches, itchy skin, light coloured faeces which could be due to pus and jaundice (yellowing of the skin and eyes). Chronic HBV infection can lead to liver scarring (Cirrhosis) and hepatocellular (liver) cancer (Weinbaum et al., 2008).

In a country like Nigeria, HBV transmission occurs mostly during adolescence or young adulthood as a result of precarious and unprotected sexual activities and drug injections (Ipinmisho, 2016). It is also one of the transfusion-transmissible infectious agents that are considered serious threats to blood safety in transfusion recipients with higher seroprevalence relative to HIV and syphilis (Buseri et al., 2009; Akani et al., 2005). Despite availability of an effective vaccine against the infection since 1982, Nigeria is classified among the group of countries endemic, with over 20 million people infected

currently (Adoga et al., 2010). It is one of the serious menaces of public health that is neglected and not given the attention it deserves (Mbaawuaga et al., 2008). Many Nigerians are unaware of this infection and hence fail to seek the appropriate medical attention leading to its progression to chronic liver disease, cirrhosis and hepatocellular carcinoma. Although hepatitis B is classified as a 'disease of priority', there is an incessant increase in detection of new cases globally (Lok and McMahon, 2009).

The secret killer hepatitis B is yet to catch the attention of health institutions, law makers and the general public even though it is a major threat to public health. Hepatitis B education is demoted to the background such that even adults do not have any place to obtain information about this deadly disease (Boakye, 2014). No effort is made on educating most Nigerian university students as well as those who are not privileged to have access to proper education. For example, majority of non-teaching staff such as the cleaners, the gardeners, the security, and kitchen staff are not degree holders. These people have little or no knowledge about how hepatitis B is contracted or the prevalence and because of lack of knowledge it usually goes undetected for a long period of time.

Further, some people are at a higher risk of getting infected with hepatitis B virus than others (Boakye, 2014). For example, drug users, people that pierce and tattoo their bodies and engage in unprotected sex without adequate knowledge about sexual negotiation and safe sex practices (Boakye, 2014; Ipinmisho, 2016). The rate of drug use is increasing steadily over the years especially in Nigerian Universities. About 40% of Nigerian youth engage in drug/substance abuse (Ipinmisho, 2016). Young boys and girls do not care where the syringe they use in injecting the substance is coming from, they just inject it and pass it around for their friends to do the same. Also, someone who is high tends to have sex at that moment without any precautions.

HBV becomes obvious when it has progressed and sometimes at the terminal point of death. Hence the need for this study particularly in a university where drug abuse and promiscuous behaviour are rampant. Therefore, in this study, the prevalence rate of hepatitis B viral infection among students and non-teaching staff of Nile University of Nigeria was determined and knowledge about the infection was assessed.

MATERIALS AND METHODS

Study design, location and period

This is a cross-sectional study involving N=200 (150 students, 50 non-teaching staff) sample, conducted in Nile University of Nigeria. Nile University of Nigeria is a private University in the center of the Federal Capital Territory, Abuja, Nigeria. The university lies between Latitude 9.0140°N, 7.3972°E. The study was carried out over a period of three months, from the first week of February 2017 to the end of May 2017.

To encourage participation, the students and non-teaching staff were informed about the study and what it entails a week before the actual administration. The students were asked to present their student identification card to participate in the study while the non-teaching staff had to be dressed in their uniform. A self-administered knowledge assessment questionnaire was also given after obtaining a consent form for socio-demographic data collection and to assess the respondent's knowledge about the infection. The standard questionnaire consisted of several questions related to the socio-demographic characteristics of the study participants such as their gender, age, marital status, educational level, as well as risk behaviour factors like sexual status, piercings and tattoos, cigarette and alcohol consumption, intra drug usage etc.

Study population

The target populations for this study were students and non-teaching staff. Nile University has an estimated population of 1500 students and 300 non-teaching staff. The study populations were selected at random, every eligible person with equal probability of being recruited. Selection was solely based on consent and meeting of eligibility criteria. The study included students from various faculties and departments, from 100 to 500 levels. The non-teaching staff included cleaners, gardeners, kitchen staff and security. The target population included male and females of different age groups.

Eligibility criteria

Inclusion criteria: Individuals that participated in this study had to fulfill the following criteria:

i) They must be adults (aged 18 and above)
ii) They must be either students or
iii) Non-teaching staff of Nile University
iv) They must give their consent.

Exclusion criteria: Individuals that were excluded from participating in this study were:

i) Individuals younger than 18 years of age
ii) Teaching staff of Nile University
iii) Non-Nile University students
iv) People that declined or did not give their consent.

Sample size estimation

Stratified random sampling method was used to appropriately estimate the prevalence of hepatitis B virus among the population (of students and non-teaching staff N=1800) of Nile University, Abuja. A total of N=200 sample size (n=150 students, n=50 non-teaching staff) were recruited to cover for the expected attrition of up to 15% (Musa et al., 2015; Naing et al., 2006).

Data collection procedures

Willing and eligible participants were given participant information sheet (PIS), bearing objectives and study details. Interested participants were then given informed consent form (ICF) for consent taking before being given self-administered questionnaires. Participation was voluntary. Blood samples were obtained from each participant. 2 ml of venous blood sample was collected aseptically into a properly labeled laboratory-number tagged EDTA

bottle. The plasma was separated from the blood by centrifugation. The plasma specimens were then screened for HBsAg using enzyme-linked immunosorbent assay test kits within 12 h of collection (using onsite HBsAg rapid test kits sourced from EGENS One Step Rapid Diagnostic Test Reagent Technology, USA). The HBsAg assay had manufacturer-reported diagnostic specificity greater than 99.0%, sensitivity greater than 97.0% and accuracy greater than 98.0%. The test kits contained a built in control feature that served as the internal control (the C-line that appears first on the test strip). An external control consisting of a confirmed positive and a confirmed negative sample was also used to assure the proper performance of the assay. The test results were reported as positive, negative or invalid accordingly. For each invalid test, the test procedure was reviewed and the test repeated with a new strip.

Methods of HBsAg screening

Blood sample was collected from each participant using a butterfly needle into an EDTA bottle, following the standard phlebotomy procedures. The blood samples collected were kept for few hours (plasma generated within 8 h of blood draw). The specimens were then centrifuged at 1500 rpm for approximately 5 min to separate plasma from cells. The resulting plasma and the hepatitis B kits were allowed to equilibrate to room temperature. The test strips were placed on a clean non-absorbent flat surface and 30-45 μL or 2-3 drops of plasma was dropped on the sample pad of the test strip not allowing the specimen to reach above the "MAX" indicated by the arrows on the strip. Timer was set up and results were read in 15 min. If only the C line is developed, the test indicates that the level of HBsAg in the specimen is undetectable (less than 1 ng/mL); therefore, the result is clear, that is, negative/non-reactive. However, if both the C and T lines are developed, the test indicates that the specimen contains HBsAg at a level equal to or higher than 1 ng/mL and is positive/reactive. Invalid result on the other hand is obtained if no C line is developed. When this happens, the assay is repeated with a new device regardless of colour development on the T line.

Ethical consideration

All ethical considerations were in accordance with the most recent 'Fortaleza Brazil 64th WMA Assembly (October 2013)' Helsinki Ethics Declaration for medical research involving human subjects (WMA, 2013). The study obtained ethical approval from the Dean of Student Affairs, Nile University of Nigeria. The researcher also got the permission to carry out the study using the university facility (Clinic/Laboratory).

Voluntary participation was based on reading and understanding the detailed participant PIS and signing the ICF. The participants that were willing to participate in this study were given a copy of the PIS which provided important details of the study such as what the study was about, the risks involved, and confidentiality. The ICF after it was signed by the participant were kept by the research team and consent taken only at baseline.

Additional verbal clarifications were given when needed. All the participants in this study completed the questionnaire given to them and were assigned anonymous numbers that were used in data analysis. No individual including the research team had access to traceable data of the participants. Unique laboratory numbers were also assigned to each participant. These laboratory numbers were linked to patient's medical records known only to the investigator for clinical data extraction and follow up purposes. The consenting participants were also free to withdraw from the study at any time. The PIS and ICF were provided in English, and a translator was also made available for those participants who were unable to read in English for verbal explanations in Pidgin and Hausa.

The laboratory hepatitis screening and notification of results were provided free to all participants. Test results were enveloped, sealed and delivered personally to each participant by the researcher, and participants with positive test results were advised to undergo testing for markers of chronic infection in a hospital and to trace the contact for prophylactic vaccination.

Data analysis

Data were checked for completeness and validity of information once the questionnaires were back from the respondents. This was done in order to check for missing data, correct mistakes, and in order to avoid errors in the data collected. The data sheets were serially numbered. Statistical analyses were performed using IBM SPSS Version 24. Association tests for comparable continuous variables were performed using applicable tests for parametric distribution of data. Chi-square (or Fischer's exact, depending on statistical condition of the data) test were used to compare proportions. Independent t test and one way-ANOVA were used to compare mean scores between comparable variables.

RESULTS

Socio-demographic details

A total of 200 participants (150 students and 50 non-teaching staff) were screened for HBsAg. There were 50.5% (n=101) male participants and 49.5% (n=99) female participants. 21% (n=42) of the students were in 300 Level, 19% (n=38) in 200 Level and also19% (n=38) in 100 Level, 10% (n=20) were in 400 Level, and 6% (n=12) were in 500 Level of their study. 55% (n=110) of the participants were in the age group 18-21; 26% (n=52) in the age group between 22 - 25; and 19% (n=38) were older than 26 years old (Table 1). The total mean age of the participants was 22.26 (SD= ±4.2). The majority (85.0%) were single while 15.0% were married. 19% (n= 38) of them take alcohol while only 11% (n=22) of them smoke. 36.5% (n= 73) of the study participants had piercings and 3.5% (n=7) had tattoos. 41% (n=82) were in sexual relationships, however only 19% (n=38) practice safe sex. Only 9.5% (n=19) has had blood transfusions in the past. The full socio-demographic details of the study participants are shown in Table 1.

Prevalence of Hepatitis B surface antigen

Majority of the total study population, 93.5% (n=187) were negative for HBsAg. Out of the 150 students tested, 98% (n=147) were negative. Out of the 50 non-teaching staff tested, 80% (n=40) were negative. The overall prevalence of HBsAg among students and non-teaching staff of Nile University of Nigeria was estimated to be 6.5%. The prevalence of HBsAg was higher among the non-teaching staff (20.0%) than among students (2.0%). Disaggregated by gender, the prevalence was higher among males (8.9%) than among females (4.0%) (Figure 1). The prevalence varied with increasing age, with the

Table 1. Socio-demographic characteristics of study participants' (N=200).

Variable	N	%
Age		
18 – 21	110	55.0
22 – 25	52	26.0
>26	38	19.0
Gender		
Male	101	50.5
Female	99	49.5
Occupational Status		
Staff (non-teaching)	50	25.0
Student	150	75.0
Marital Status		
Single	170	85.0
Married	30	15.0
Religion		
Islam	130	65.0
Christianity	70	35.0
Residence		
On-Campus	51	25.5
Off-Campus	99	49.5
Staff	50	25.0
Alcohol Use		
Yes	38	19.0
No	162	81.0
Piercings		
Yes	73	36.5
No	127	63.5
Tattoo		
Yes	7	3.5
No	193	96.5
Smoking Status		
Yes	22	11.0
No	178	89.0
Drug use		
Yes	16	8.0
No	184	92.0
Inject Drugs		
Yes	9	4.5
No	7	3.5
Sexual Relationship		
Yes	82	41.0
No	118	59.0
No of Sexual Partners		
1-3	59	29.5
3-6	12	6.0
>6	129	64.5
Safe Sex Practice		
Yes	38	19.0
No	44	22.0
Blood Transfusion History		
Yes	19	9.5
No	181	90.5

highest prevalence found in individuals that are more than 25 years of age. 9 out of the 13 positive people were aged above 25 years.

Awareness about Hepatitis B viral infection

55.5% (n=111) of the total study participants had prior knowledge or have heard about hepatitis B viral infection while 44.5% (n=89) have never heard about the infection before. More than half of the non-teaching staff population, 64% (n=32) have no knowledge about hepatitis B infection while 36% (n=18) had knowledge about it. On the other hand, a greater number of students, 62% (n=93) are aware of the infection compared to the 38% (n=57) that are not aware of it (Figure 2).

Knowledge assessment of students

Table 2 shows the students' level of knowledge about the HBV infection. It shows that more than half of the students (59.5%) knew that HBV could be sexually transmitted. 42% of the students answered correctly that HBV could be transmitted by sharing toothbrush with an infected person. The majority (75.5%) of the students answered correctly that HBV is not transmitted by holding hands with an infected person. Only 7% of the students knew correctly that HBV is not genetic. 47% of the students knew that HBV can be transmitted during birth from mother to child. A great number (73.5%) of students knew that HBV is not an airborne virus. However, 54% of the students did not know that HBV causes liver cancer. 60% knew that HBV have signs/symptoms while only 23.5% knew that even asymptomatic carriers of HBV could transmit the infection (Table 2).

Knowledge assessment of non-teaching staff

From Table 3, most of the non-teaching staff (42%) answered incorrectly that HBV is not sexually transmitted. Only 14% knew that HBV could be transmitted by sharing toothbrush. Half of the non-teaching staff (50%) knew that HBV is not transmitted by holding hands with an infected person. However, more than half (58%) of them answered incorrectly that HBV is inherited. 26% of the non-teaching staff knew that HBV can be transmitted from mother to child. More than half (52%) of them knew that HBV is not airborne. Only 14% of them knew that HBV causes liver cancer. 50% of the non-teaching staff answered correctly that HBV has signs/symptoms. Majority (62%) of them were unaware that an asymptomatic carrier of HBV can transmit it (Table 3).

Source of information on hepatitis virus infection

The major source of information about Hepatitis B virus

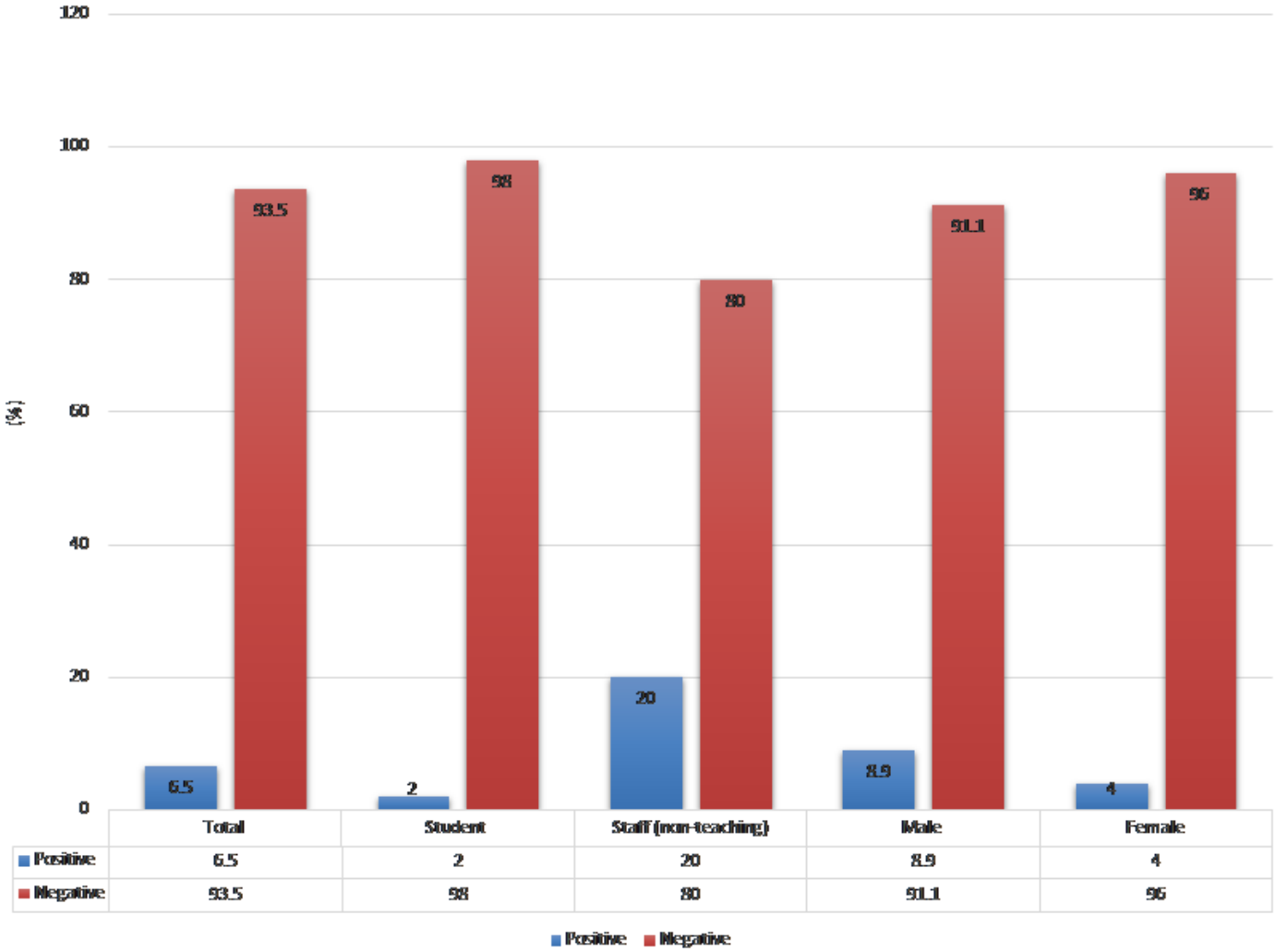

Figure 1. Prevalence of HBsAg in the study population (N=200).

was the media. 36.1% of the total study population (29% of the students and 13% of the non-teaching staff) got their information about the infection through the media. 27% of the total study population (29% of the students and 3% of the non-teaching staff) indicated family and friends as their source of information about the infection while 17.2% of the students got their knowledge of the infection from school (Figure 3). Hospital was the source of information on hepatitis B virus for 17.2% of the student population. 7.6% of the students indicated church as their source of information about hepatitis B. No non-teaching staff acquired information about the infection from school, hospital and church. Meanwhile 2% of the staff population got their information about HBV through other sources (Figure 3).

DISCUSSION

The overall prevalence rate of Hepatitis B viral infection among students and non-teaching staff of Nile University of Nigeria was estimated to be 6.5%. The prevalence of HBsAg was higher among non-teaching staff (20.0%) than among students (2.0%). Disaggregated by gender, the prevalence was higher among males (8.9%) than females (4.0%).

The results are in contrast with the findings of Mboto and Edet (2012) but consistent with the findings of a prevalence study carried out in University of Maiduguri (Isa et al., 2015). The results are also consistent with the prevalence study carried out in University of Jos, Nigeria (Ekuma et al., 2014) where males had a significantly higher HBsAg prevalence compared to their female counterparts. The knowledge level among students was significantly higher than that among the non-teaching staff probably due to the source(s) of information they had access to.

Also, the response from the questionnaire indicated that non-teaching staff, especially the males had more sexual partners compared to the students who were not as sexually active and practiced safe sex. The

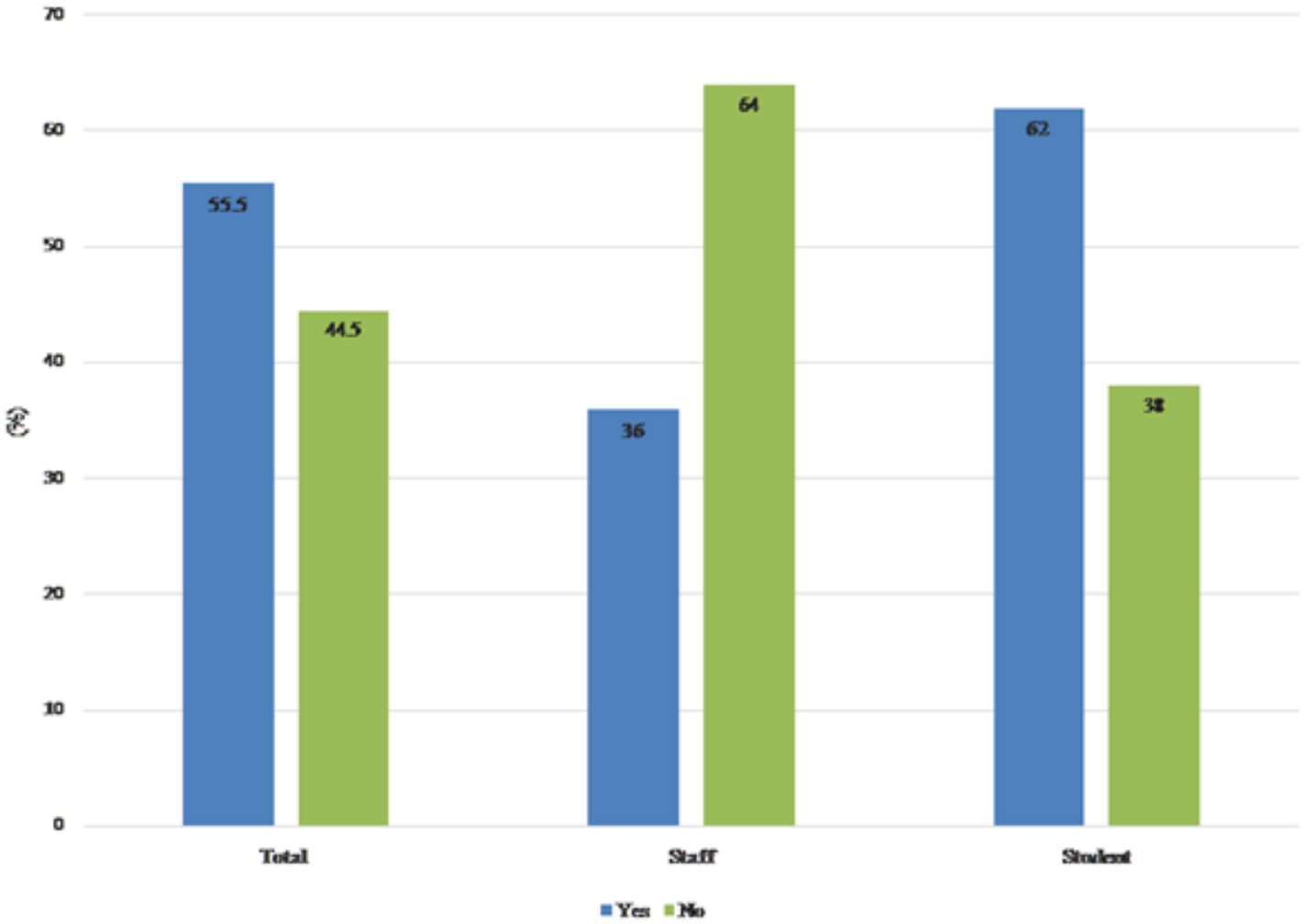

Figure 2. Awareness about Hepatitis B viral infection (N=200).

Table 2. Knowledge assessment of students (N=150).

Knowledge	Yes {N (%)}	No {N (%)}	Don't Know {N (%)}	Total {N (%)}
Do people get HBV through sexual intercourse?	89(59.5)	35(23)	26(17.5)	150(100)
Do people get HBV by sharing toothbrush?	63(42)	40(27)	47(31)	150(100)
Do people get HBV by holding hands?	19(12.5)	113(75.5)	18(12)	150(100)
Do people inherit HBV?	69(46)	11(7)	70(47)	150(100)
Do people get HBV during birth?	70(47)	56(37)	24(16)	150(100)
Do people get HBV through air?	10(6.5)	110(73.5)	30(20)	150(100)
Does HBV cause liver cancer?	42(28)	27(18)	81(54)	150(100)
Does HBV have signs and symptoms?	90(60)	25(17)	35(23)	150(100)
Can an asymptomatic person transmit HBV?	35(23.5)	29(19)	86(57.5)	150(100)

differences in exposure to risk factor could be the reason for the differences in prevalence. The higher prevalence among the non-teaching staff is probably due to lack of knowledge about safe sex practices as a result of the level of their education despite being older than the students. Most of them were gardeners, cooks, cleaners, technicians etc. hence it is not surprising that they are unaware of the existence of such an infection. This study

Table 3. Knowledge assessment of non-teaching staff (N=50).

Knowledge	Yes {N (%)}	No {N (%)}	Don't Know {N (%)}	Total {N (%)}
Do people get HBV through sexual intercourse?	12(24)	21(42)	17(34)	50(100)
Do people get HBV by sharing toothbrush?	7(14)	40(80)	3(6)	50(100)
Do people get HBV by holding hands?	17(34)	25(50)	8(16)	50(100)
Do people inherit HBV?	29(58)	11(22)	10(20)	50(100)
Do people get HBV during birth?	13(26)	14(28)	23(46)	50(100)
Do people get HBV through air?	10(20)	26(52)	14(28)	50(100)
Does HBV cause liver cancer?	14(28)	27(54)	9(18)	50(100)
Does HBV have signs and symptoms?	25(50)	6(12)	19(38)	50(100)
Can an asymptomatic person transmit HBV?	15(30)	4(8)	31(62)	50(100)

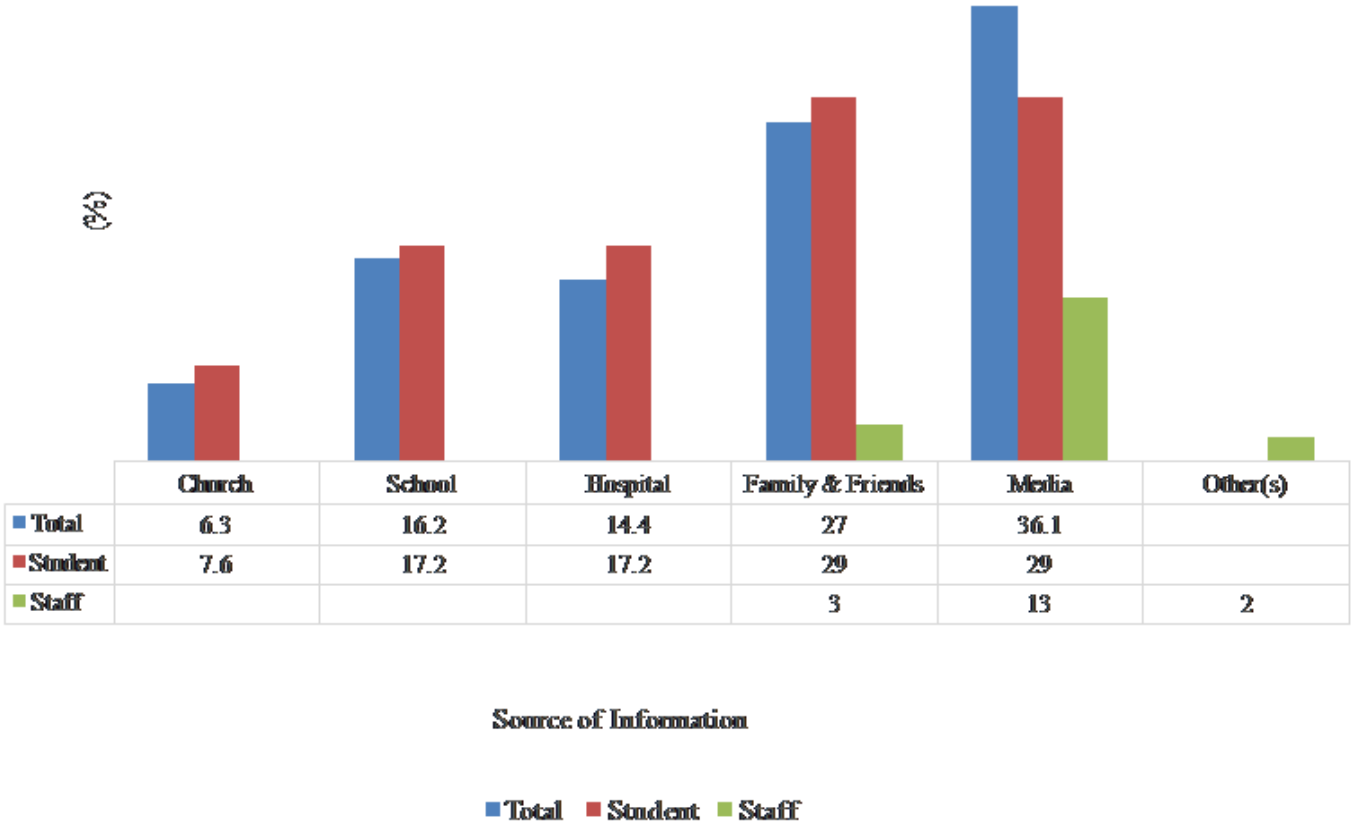

Figure 3. Source of information on Hepatitis B viral infection (N=200).

also showed that females had more knowledge about the infection compared to their male counterparts. This could be another reason for the higher prevalence in males.

Attributing factors for HBV infection

The prevalence of Hepatitis B viral infection among non-teaching staff of Nile University is significantly higher than among students (P<0.001) (Table 4). Those who practice safe sex had lower prevalence of HBV infections than those who did not practice safe sex, and the difference was statistically significant (*P*<0.001). Likewise, those who are not sexually active recorded a significantly lower prevalence (all sexually inactive individuals in this study were negative) compared to those who are sexually active (P<0.001).

Interestingly, those who have donated blood have a lower prevalence of HBV compared to those who have not donated blood previously (P< 0.024).

Table 4. Factors associated with HBV infection.

Variable	N	HBV +ve {N (%)}	HBV –ve {N (%)}	X^2 Statistics (df)	*P* value[a]
Gender					
Male	101	9 (8.9%)	92 (91.1)	1.95 (1)	0.162
Female	99	4 (4.0)	95 (96.0)		
Educational Status					
Student	150	3 (2.0)	147 (98.0)		<0.001[b]
Non-teaching staff	50	10 (20.0)	40 (80.0)		
Marital Status					
Single	170	12 (7.1)	158 (92.9)		0.696[b]
Married	30	1 (3.3)	29 (96.7)		
Age					
18-21	110	2 (1.8)	108 (98.2)		
22-25	52	2 (3.8)	50 (96.2)		
>25	38	9 (23.7)	29 (76.3)		
Safe Sex					
Yes	38	0 (0.0)	38 (100.0)		<0.001[b]
No	44	13 (29.5)	31 (70.5)		
Sexually Active?					
Yes	81	13 (16.0)	68 (84.0)	20.43(1)	<0.001
No	119	0 (0.0)	119 (100.0)		
Transfusion (donated)					
Yes	19	4 (21.1)	15 (78.9)		0.024[b]
No	181	9 (5.0)	172 (95.0)		
Sexual Partners (n)					
1-3	59	0 (0.0)	59 (100.0)		0.004[b]
3-6	12	3 (25.0)	9 (75.0)		
>6	129	10 (7.8)	119 (92.2)		

[a]Chi-square test of independence; [b]Fisher's exact test.

The more sexual partners, the higher the prevalence of HBV (*P*<0.004). However, the prevalence of HBV infection between male and female (P<0.162) and being married or single (0.696) were not statistically different (Table 4).

Conclusion

This study thus showed a low prevalence rate of Hepatitis B viral infection among the students and non-teaching staff of Nile University of Nigeria. The prevalence was significantly higher among the non-teaching staff than among students and higher among males than females. The prevalence was also significantly higher among those with multiple sexual partners, who do not practice safe sex. The difference in prevalence is probably because the non-teaching staff engage in more promiscuous activities and most of them are unaware or completely ignorant on safe sex practices coupled with the fact that they have little or no knowledge of hepatitis B and its health challenges. Hence the need for creation of awareness in the university is of great importance because if adequate precautions are not taken, the spread of hepatitis B virus could continue unabated.

It is said that "disease control by preventive strategy is more effective than a curative one". The best time to tackle an issue is at its earliest stage. It is therefore at this point in time when the prevalence of the virus in the university is low that action should be taken. Hepatitis B is the deadliest of all viral hepatitis; this fatal health issue should not be neglected as it is less obvious and more infectious than the highly stigmatized HIV/AIDS. It is difficult to eradicate or prevent the spread of a disease without continuous sustainable awareness creation and enlightenment. An academic course addressing it and other serious infectious diseases should be made mandatory to be taken by all university students. Also, periodic seminars and trainings should be organised for non-teaching staff. Enlightenment programs should be made available for students and both teaching and non-teaching staff of the university. In addition, vaccination/immunization should be made available for all students and staff. This fatal health issue should be

neglected no more; it is obvious that it is more infectious than the highly stigmatized HIV/AIDS. Finally, universities should come up with follow-up programs that will help those already infected to manage and treat the infection.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

ACKNOWLEDGEMENTS

This work could not have been accomplished without the support of the clinician, Dr. Justin Wende. The authors also like to thank everyone who participated in this study.

REFERENCES

Adoga MP, Gyar SD, Pechulano S, Bashayi OD, Emiasegen SE, Zungwe T, Iperepolu OH, Agupugo C, Agwale SM (2010). Hepatitis B virus infections in apparently healthy urban Nigerians: data from pre-vaccination tests. J. Infect Dev. Ctries 4:397-400.

Afihene MY, Duduyemi BM, Khatib M (2015). Knowledge, Attitude And Practices Concerning Hepatitis B Infection, Among Healthcare Workers In Bantama, Ghana: A Cross Sectional Study. DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20150477

Akani CI, Ojule AC, Opurum HC, Ejilemele AA (2005). Sero-prevalence of hepatitis B surface antigen (HBsAg) in pregnant women in Port Harcourt, Nigeria. Niger. Postgrad. Med. J. 12:266-270.

Baruch S (2015). What Is Hepatitis B? [Online]. [Accessed 01/03/2017].

Boakye K (2014). Assessing The Knowledge And Perception On Hepatitis B Among Senior High School (Shs) Students In Dunkwa-On-Offin.

Buseri FI, Muhibi MA, Jeremiah ZA (2009). Sero-epidemiology of transfusion-transmissible infectious diseases among blood donors in Osogbo, south-west Nigeria. Blood Transfusion 7:293.

Centers for Disease Control (CDC) (2016). Viral Hepatitis [Online]. Available at: https://www.cdc.gov/Hepatitis/Hbv/Bfaq.Htm [Accessed 01/01/2017].

Clerkin A (2016). WHO Says 95% Of People With Hepatitis Don't Know They Have It [Online]. Available: Http://www.newstalk.com/Who-Says-95-Of-People-With-Hepatitis-Dont-Know-They-Have-It [Accessed 01/03/2017].

Davis C (2016). Hepatitis (Viral Hepatitis A, B, C, D, E G) [Online]. Available at: https://www.Medicinenet.Com/Viral_Hepatitis/Article.htm [Accessed 01/03/2017].

Davis K (2015). Hepatitis: Causes, Symptoms And Treatments [Online]. Medical News Today. Available: https://www.medicalnewstoday.com/Articles/308421.php [Accessed 01/03/2017].

Ekuma OO, Mawak JD, Uwakwe A, Ogbu O, Okoh FN, Agah MV, Nnachi AU (2014). Prevalence Of Hepatitis B Surface Antigen Among The Newly Admitted Students Of University Of Jos, Nigeria. DOI: http://dx.doi.org/10.11648/j.ajls.2014020

Emechebe G, Emodi I, Ikefuna A, Ilechukwu G, Igwe W, Ejiofor O, Ilechukwu C (2009). Hepatitis B virus infection in Nigeria-A Review. Niger. Med. J. 50:18.

Ipinmisho O (2016) 40% Of Nigerian Youths Engage In Substance Abuse [Online]. Thisday Newspaper. Available at: https://www.thisdaylive.com/Index.php/2016/05/20/40-Of-Nigerian-Youths-Engage-In-Substance-Abuse/ [Accessed 01/01/2017].

Isa M, Bello H, Mustapha A, Mangga H, Gulani I, Aisha M (2015). Prevalence Of Hepatitis B Virus Among Students Attending University of Maiduguri Clinic, Borno, Nigeria. Int. J. Adv. Res. Biol. Sci. P 2.

Lok AS, Mcmahon BJ (2009). Chronic Hepatitis B: Update 2009. Hepatology 50:661-662.

Mbaawuaga E, Enenebeaku M, Okopi J (2008). Hepatitis B Virus (Hbv) Infection Among Pregnant Women In Makurdi, Nigeria. Afr. J. Biomed. Res. P 11.

Mboto C, Edet E (2012). Prevalence And Risk Factors Of Hepatitis B Virus Infection Among Students In The University Of Uyo. Int. J. Modern Biol. Med. 2:101-111.

Musa B, Bussell S, Borodo M, Samaila A, Femi O (2015). Prevalence Of Hepatitis B Virus Infection In Nigeria, 2000-2013: A Systematic Review And Meta-Analysis. Niger. J. Clin. Pract. 18:163-172.

Naing L, Winn T, Rusli B (2006). Practical Issues In Calculating The Sample Size For Prevalence Studies. Arch. Orofacial Sci. 1:9-14.

Nettleman M (2016). Hepatitis B (Hbv, Hep B) [Online]. Available at: Https://www.emedicinehealth.com/Hepatitis_B/Article_Em.Htm [Accessed 01/01/2017].

Nguyen TT, Taylor V, Chen Jr MS, Bastani R, Maxwell AE, Mcphee SJ (2007). Hepatitis B Awareness, Knowledge, And Screening Among Asian Americans. J. Cancer Educ. 22:266-272.

Niddk (2012). Hepatitis (Viral) [Online]. Available: https://www.niddk.nih.gov/Health-Information/Liver-Disease/Viral-Hepatitis [Accessed 01/01/2017].

Schoenstadt A (2017). Hepatitis B Incubation Period [Online]. Available at: http://hepatitis.emedtv.com/M/Hepatitis-B/Hepatitis-B-Incubation-Period.html [Accessed 01/03/2017].

Weinbaum CM, Williams I, Mast EE, Wang SA, Finelli L, Wasley A, Neitzel SM, Ward JW (2008). Recommendations For Identification And Public Health Management Of Persons With Chronic Hepatitis B Virus Infection. Mmwr Recomm. Rep. 57:1-20.

World Health Organisation (WHO) (2016). Who Encourages Countries To Act Now To Reduce Deaths From Viral Hepatitis [Online]. Available at: http://www.who.Int/Mediacentre/News/Releases/2016/World-Hepatitis-Day/En/ [Accessed 01/03/2017].

World Health Organisation (WHO) (2017). Hepatitis E [Online]. Available at: http://www.who.Int/Mediacentre/Factsheets/Fs280/En/ [Accessed 04/12/2017].

World Medical Association (WMA) (2013). Wma Declaration Of Helsinki – Ethical Principles For Medical Research Involving Human Subjects [Online]. Available at: https://www.wma.net/Policies-Post/Wma-Declaration-Of-Helsinki-Ethical-Principles-For-Medical-Research-Involving-Human-Subjects/ [Accessed 01/03/2017].