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RESEARCH ARTICLE

Hepatitis B and C Viral Infections among Clinical Medical Students in Jos, North Central Nigeria

Infections virales des hépatites B et C chez les étudiants en médecine clinique de Jos, Centre-Nord du Nigeria

Y. J. Peters*†, S. Ramyil†, D. D. Freeman†, A. H. Isa‡, A. S. Anzaku§, M. I. Builders¶, A. M. Yakubu**

ABSTRACT

BACKGROUND: **The people most at risk of hepatitis B virus (HBV) and hepatitis C virus (HCV) infection by mucocutaneous exposure are healthcare and public safety workers who are exposed to blood and body fluids. Medical students who are being trained to practise within the healthcare environment are also at risk of contracting these viruses.**

OBJECTIVES: **The objective of this study was to determine the prevalence of HBV and HCV infection among clinical medical students in Jos and vaccinate those who were hepatitis B surface antigen (HBsAg) seronegative.**

METHODS: **We conducted a cross sectional study of clinical medical students. All clinical medical students of Bingham University were targeted. A structured questionnaire was administered to obtain demographic data on risk of exposure to HBV and HCV infections. Laboratory analysis of hepatitis virus antibodies from blood sample collected from each student was undertaken. The prevalence rate and test of association between variables were appropriately determined.**

RESULTS: **Of a total of 116 students enrolled, 51(44%) were males and 65 (56%) were females. Six (5.2%) students were HBsAg seropositive, none was previously immunized against HBV infection, among them, four (3.5%) had detectable serum HBeAb levels. None of the students who previously had HBV vaccination was seropositive for HBsAg. Two (1.7%) students had detectable serum anti-HCV, one from each gender.**

CONCLUSION: **We conclude that the prevalence rates of HBV and HCV infections are relatively low among the clinical medical students. All HBsAg seronegative students should be offered HBV vaccine. BJM 2017; 1(1): 19–22.**

Keywords: Hepatitis B virus, hepatitis C virus, medical students, Jos.

ABSTRAIT

CONTEXTE: Les personnes les plus à risque de virus de l'hépatite B (VHB) et le virus de l'hépatite C (VHC) par l'exposition mucocutanée sont les travailleurs de la santé et de la sécurité publique qui sont exposés au sang et les fluides corporels. Les étudiants en médecine sont formés et se pratiquer dans le milieu des soins de santé; ils sont à risque d'exposition à ces virus.

OBJECTIFS: L'objectif de cette étude était de déterminer la prévalence du VHB et du VHC chez les étudiants en médecine clinique à Jos et vacciner ceux qui étaient HBsAg séronégatifs.

Méthodes: Nous avons mené une coupe, étude descriptive transversale d'étudiants en médecine clinique. Tous les étudiants en médecine clinique de l'Université Bingham ont été ciblés. Un questionnaire structuré a été administré pour obtenir des données démographiques sur le risque d'exposition au VHB et du VHC. L'analyse en laboratoire des anticorps du virus de l'hépatite de l'échantillon de sang prélevé sur chaque sujet a été entreprise. Le taux de prévalence et le test d'association entre les variables a été déterminée en utilisant le test de chi carré de Pearson.

RÉSULTATS: Sur un total de 116 sujets inscrits, 51 (44%) étaient des hommes et 65 (56%) étaient des femmes. Six (5,2%) sujets étaient HBsAg séropositifs, aucun n'a été préalablement immunisé contre l'infection par le VHB, parmi eux 4 (3,5%) avaient Ac anti-HBe sérique détectable. Aucun des sujets qui avaient auparavant vaccination contre le VHB était séropositif pour HBsAg. Deux (1,7%) des sujets avaient antiHCV sérique détectable, un de chaque sexe.

CONCLUSION: Nous avons conclu que la prévalence du VHB et du VHC sont relativement faibles chez les étudiants en médecine clinique. Tous les sujets séronégatifs HBsAg devraient être offerts vaccin contre le VHB. **BJM 2017; 1(1): 19–22.**

Mots clés: VHB, VHC, étudiants en médecine, Jos.

Departments of †Medical Microbiology and Parasitology, ‡Haematology and Blood Transfusion, §Obstetrics and Gynaecology, ¶Pharmacology and Therapeutics, **Paediatrics, College of Medicine and Health Sciences, Bingham University Teaching Hospital, Jos.

***Correspondence: Dr. Y. J. Peter,** Department of Medical Microbiology and Parasitology, College of Health Sciences, Bingham University, Jos.drjonahp@gmail.com

Abbreviations: HBV, hepatitis B virus; **HCV,** hepatitis C virus, **HBsAg,** hepatitis B surface antigen; **HBeAb,** hepatitis B antobody.

INTRODUCTION

Hepatitis due to hepatitis B virus (HBV) and hepatitis C virus (HCV) are oa a major global public health concern because of worldwide distribution of the viruses and significant attendant mortality and morbidity.[1,2] They are also the leading cause of liver cirrhosis and cancer around the world.[3] The persons at most risk for hepatitis infection by cutaneous or mucosal exposure are healthcare and public safety workers who are reasonably anticipated to be exposed to blood and body fluids.[4] Hepatitis B virus is a prototype for the hepadnaviridae family of hepatotropic partially double stranded DNA viruses, while HCV is a single stranded RNA virus belonging the family, Flaviviridae.[7] Although very different at the molecular level, HBV and HCV share may similarities as pathogens.

Perinatal and sexual exposures to viral pathogens are highly efficient modes of transmission and person-to-person spread of viral hepatitis. This infection occurs among household contacts of a chronically infected person, likely as a result of non-intact skin or mucous membrane contact with secretions containing blood.[8] Percutaneous exposures that have resulted in transmission of hepatitis include contaminated equipment , illegal injection drug use, and needle sticks or other injuries from sharp instruments sustained by hospital personnel.[9] In addition, occasional outbreaks of HBV infection have been associated with tattooing and acupuncture.[10] In developing countries, donor testing for HBsAg is not universal. Transmission through unsafe therapeutic practices, including inadequately sterilized needles and medical instruments, and the reuse of disposable needles and syringes remains a significant problem.[11] Rarely, transmission has followed bites from infected persons and it has been suggested that most horizontal transmission within families and among young children is due to inapparent parenteral exposure to saliva or blood.[12] Health education is the cornerstone in the prevention of these viral infections.[13–15] Immunization remains the most effective way to control HBV infection.[16] This stresses the importance of HBV vaccination among all health care workers including clinical medical and nursing students. Hepatitis B vaccination is recommended for healthcare personnel at risk for occupational exposure to this blood borne pathogen.

Bingham University medical students who would come to the hospital for clinical training to be trained in a hospital will be at risk of HBV and HCV infections. We conducted a cross sectional, descriptive study of fresh intake of clinical medical students of Bingham University Teaching Hospital. The aim of this study was to determine the HBV and HCV status of all medical students coming to Bingham University Teaching Hospital for training and to immunize those students who were found to be HBsAg seronegative.

SUBJECTS

All the clinical medical students of Bingham University were targeted. The 123 clinical medical students who were eligible to be recruited included all medical students who started clinical training in the years 2012, 2013 and 2014. Each student was enrolled within two weeks of reporting to the hospital for clinical training. Only clinical medical students who accepted to participate by signing the informed consent form were recruited. Ethical clearance for the study was obtained from the Bingham University Teaching Hospital, human research and ethics committee (BHUTH/HREC/SNO/00033).

Pretest counseling was given to each student in confidence and an informed consent obtained. A structured questionnaire was administered to obtain demographic risk of exposure to HBV and HCV infection data from each student. The questionnaire included questions on socio-demographics, medical history, and exposure to sexual activity, jaundiced patients and socio-cultural activity that involved blood. Each student was then registered with a unique study number which was used to track their blood sample.

A blood sample of 4-5 ml was collected from each student into an EDTA vacutainer bearing the unique subject number. Each sample was centrifuged at 2500 rpm for five minutes and plasma obtained. The plasma was divided and held in duplicate vials stored at –20°C until needed. A stored sample was thawed and brought to room temperature just before it was analysed. Each sample was screened for HBsAg using ABON (HBsAg) and anti-HCV using ABON (antiHCV) rapid test strips (Abon Biopharm, China). All the samples that were found positive for HBsAg were also tested for anti-HBsAb and HBeAb by a second test using One step HBV (Biotec, Middlesex UK) rapid test strips. Blood samples from students previously vaccinated against HBV were also tested for anti-HBsAb and HBeAb.

The data was analysed using SPSS (SPSS Inc., Chicago IL.U SA) version 17. The Pearson's Chi square test at 95% confidence with statistical significant level set at $p<0.05$ was used to test the data obtained.

RESULTS

A total of 116 students were recruited, of which 51 (44%) were males and 65 (56%) females. The mean age for males was 23.4 years and for females 23.6 years with a range of 19–51 years. One hundred and eleven (95.7%) of the students lived in a city rather than town or village; 99 (85.3%) of the students were domiciled in Plateau state.

Twenty-one (18.1%) students were previously immunized against HBV infection, 13(11.2%) of whom were males and eight (6.9%) were females. Thirty-six (31.0%) students were previously hospitalized or had surgery, 14 (12.0%) were males, 22 (18.9%) were female. Forty-four (37.9%) had contact with jaundiced patients, 18(15.5%) were males, 26 (22.4%) were females while 46(39.7%) students had dental procedures performed on them (Table 1). Sixteen (13.8%) shared sharp objects with others, 6(5.2%) were males, 10 (8.6%) were females. Eleven (9.5%) had tattoo marks, 5(3.0%) were males, 9 (7.7%) were females. Six (5.2%) female students suffered jaundice another 3 (2.6%) female students had traditional surgery like tattoo, scarifications and circumcisions. Three students (2.6%) had blood transfusion, two (1.7%) were males, one (0.9%) was female.

Table1: Distribution of Medical Students by Risk Factors for Viral Hepatitis

Risk Factor	Number (%)		
	Male	Female	Total
N	**51**	**65**	**106**
Immunization	13(25.5)	8(12.3)	**21(19.8)**
Hospitalization	14(27.5)	22(33.8)	**36(33.3)**
Dental procedure	17(33.3)	29(44.6)	**46(43.3)**
Blood Transfusion	2(39.2)	1(1.5)	**3(2.8)**
Shared sharps	6(11.3)	10(15.4)	**16(15.1)**
Suffered jaundice	0	6(7.2)	**6(5.7)**
Contact Jaundice	18(35.3)	26(40.0)	**44(41.5)**
Scarification mark	5(9.8)	6(9.2)	**11(10.4)**
Traditional Surgery	0	3(4.6)	**3(2.8)**

Six (5.2%) male students were HBsAg seropositive, none of whom was previously vaccinated against HBV. The Chi square output revealed that the prevalence of Hepatitis B virus infection for male and female respondents differed significantly ($p<0.05$). There was a rise of HBV infection with increasing age starting at age 21 years (Figure 2). Among the seropositive students, four (3.5%) had detectable HBeAb, only nine (7.8%) out of the 21(18.1%) previously vaccinated students had detectable serum antiHBsAb. None of those previously vaccinated against HBV infection however, was seropositive for HBsAg.

Two (1.7%) students were seropositive for HCV infection, one each from either gender ($p>0.05$). This gave a HCV prevalence of 1.7% in our study subjects.

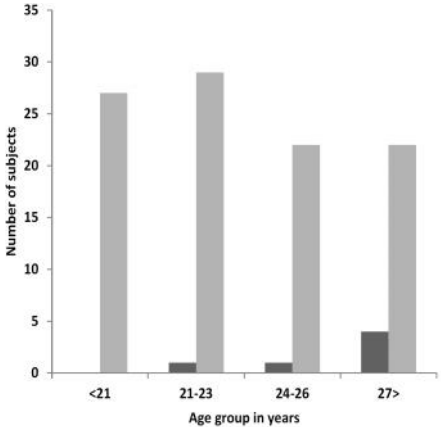

Fig. 1: Distribution of Participants by Age and HBsAg Serum Reaction ■ Reactive ■ Non-reactive.

No socio-demographic variable was significantly associated with HBV or HCV infection. There was no co-infection for the two viruses in any subject.

DISCUSSION

this study, we examined the occurrence of HBsAg and anti HCV among clinical students in Jos. A common socio-demographic risk of exposure associated to HBV and HCV infection could not be determined from this study.[11] Significantly however, is that none of the students who previously had accepted HBV vaccine intervention was seropositive for HBsAg in this study, this may be an indication of efficiency of the vaccine given. All the HBsAg positive students were male, this was surprising; the reason for this bias if determined would be a significant finding.

We found HBsAg prevalence of 5.2% and anti HCV prevalence of 1.7% among our students. This HBsAg prevalence of about 5% is low compared to findings from other parts of Nigeria[17,18] and Africa[19] as well as earlier studies from Jos.[20–22] The relatively low HBsAg prevalence in these students compared to the prevalence in the general population is not surprising. These students, who were undergraduates, were more likely to be from families with better education and health awareness. These students were likely to be less exposed to the negative risk of exposure and unsafe practices associated with HBV and HCV infections compared to the general population.

The prevalence of HBV and HCV infections are relatively low among these clinical medical students compared to the prevalence of the general population. However, there is a need to screen all clinical medical students at commencement of their clinical study years so as to vaccinate those who are seronegative against HBV, to protect them from future risk of infection by the virus.

Conflict Of Interest

I declare no conflict of interest that might have led to bias in this work.

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