Sero-frequency of Hepatitis B Infection among Health Care Workers in Khartoum

Maab Abdalwhab and Mohammed Nafi

Al-Neelain University; Faculty of Medical Laboratory Science; Microbiology Department
Address correspondence: Maab Abdalwhab
AL-Neelein University, Faculty of Medical Laboratory Science
P.O. Box: 12702, Cod 11121, Khartoum – Sudan
Mobile phone: +249918029989, E-mail: muslim72411@gmail.com

Abstract

Background: Health care workers (HCWs) are at a great risk of occupational exposure with blood borne pathogens like Hepatitis B virus (HBV). The risk of occupational exposure to such infection has been the concerns of HCWs for years. However, there were scarcity of information on frequency of Hepatitis B virus infection in the study area.

Objective: The current study aimed to determine the sero-frequency of Hepatitis B virus infection among Health care workers in Khartoum.

Methods: The current descriptive, cross-sectional study conducted among HCWs from different hospitals in Khartoum from May to July 2014. A structured questionnaire was used to collect demographics and clinical data. Enzyme linked immunoassay (ELISA) was done to determine the presence of HBsAg among 90 HCWs.

Result: Of the 90 HCWs enrolled in the study, HBsAg was detected in 4 (4.4%). The positivity of HBsAg, in this study, was more among males and staff more than 50 years old. The occupational risk of HBV infection among the HCWs in this study was high for the laboratory technicians followed by nurses and cleaning staff.

Conclusion: The occupation risk of HBV infection among the HCWs in this study was high. HBV vaccine should be more readily available for HCWs by reinforcing vaccination programs.

Keywords: Sero-frequency, HBsAg, HCWs, ELISA, Khartoum-Sudan

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Introduction

Hepatitis B virus (HBV) has long been recognized as an occupational risk for health-care workers (HCWs) [1,2]. The virus remains infectious for prolonged periods on environmental surfaces and is transmissible in the absence of visible blood [1]. HCWs do not recognize all exposures to potentially infectious blood or body fluids [2] and, even if exposures are recognized, often do not seek post-exposure prophylactic management [3]. In serologic studies conducted in the United States during the 1970s, HCWs had a prevalence of HBV infection approximately 10 times greater than the general population [1]. In 1983, an estimated 17,000 HBV infections occurred among HCWs [4]. Over two billion people worldwide have evidence of previous or current hepatitis B virus (HBV) infection. Three quarters of the world population live in areas with high levels of infection [5]. Sudan is classified among countries with a high hepatitis B surface antigen (HBsAg), with endemicity of more than 8% [6]. Exposure to HBV infection ranges from 47% [7] to 78% [8] with HBsAg sero-prevalence ranging from as low as 6.8% [7] in central Sudan to as high as 26% in southern Sudan [9]. The virus is transmitted by exposure to infectious blood or body fluids such as semen and vaginal fluids, while viral DNA has been detected in the saliva, tears, and urine of chronic

carriers. Perinatal infection is a major route of infection in areas of the world where the disease is common [10]. Other risk factors for developing HBV infection include working in a healthcare setting, transfusions, dialysis, sharing razors or toothbrushes with an infected person, travel in countries where it is common [11,12,13]. The World Health Organization (WHO) estimates that about two million HCWs face occupational exposure to HBV each year and that 90% of the infections that result from these exposures are in low-income countries, especially those in sub-Saharan Africa [14,15]. In developing countries, 40 - 60% of HBV infection in HCWs was attributed to professional hazard while in developed countries the attributed fraction was less than 10% due to vaccination coverage [16]. Although most of the HBV infections in HCWs are attributed to per-cutaneous exposure, in many studies, most infected HCWs could not recall any overt per-cutaneous injury [17]. The objective of the current study was to determine the sero-frequency of HBV (HBsAg) among HCWs in Khartoum-Sudan.

Methods

The current descriptive, cross-sectional study carried out between May and July 2014. Ninety normal HCWs were selected randomly from different hospitals in Khartoum - Sudan. This study was approved by Al-Neelain University ethical committee board and an informed consent was obtained from each participants before collecting the demographic and clinical data. Five-mL blood samples were obtained by venipuncture for serological analyses. Samples were centrifuged and sera were separated immediately. Sera were stored at –20^{O}C, and tested for the presence of HBsAg by enzyme-linked immunosorbent assay (ELISA) (DS-EIA-HBsAg, WA-8003, USA). The presence of HBsAg was considered as the evidence for prior exposure to HBV (Recent infection or chronic carrier). All collected data were analyzed using SPSS. Descriptive statistics were reported as the mean ± SD for continuous variables

and as the frequency (%) for dichotomous variables. To evaluate the relationship between different factors, we performed chi-square analysis. Quantitative variables were compared using independent t-test. P. values < 0.05 were considered statistically significant.

Results

Ninety HCWs at different Khartoum hospitals were enrolled in the current study between May and July 2014, 52 (57.8%) were males and 38 (42.2%) were females. The age range was between 22 and 63 years and the median age was 37.8 years. Regarding their occupation category, the majority of the study group (41.1%) were laboratory technicians while nurses, clinician and cleaning staff represented 25.6%, 21.1% and 12.2% respectively. None of the participants was vaccinated against HBV. HBsAg was detected in 4 (4.4%), 3 (3.3%) of them were males and 1 (1.1%) was female, There is no statistical significant relationship (P value >0.05), between the presence of HBsAg and all variables tested including gender, age, occupation, previous exposure to body fluids and previous needle stick injuries.

Discussion

The main finding of the study was the prevalence of HBsAg (4.4%) HCWs in Khartoum. The prevalence of HBsAg among HCWs was lower to prevalence among HCWs in Sana'a-Yemen (2004) (9.9%) [18] and Palestine (2005) (9.6%) [19]. However, the prevalence was higher than the prevalence among the same study group in Sudan (2008) (2.4%) [20], Moroccan (2008) (1%) [21] and Korea (2006) (2.4%) [22].

The positivity of HBsAg in this study was more among males than females and older staff (>50 years) than younger staff, but this was statistically insignificant. The occupational risk

of HBV infection among the HCW in this study was high for the laboratory technicians followed by nurses and cleaning staff.

The prevalence of current hepatitis B virus infection and life time exposure to hepatitis B virus infection among health care workers was high. Exposure to potentially infectious body fluids was also high and unfortunately no one of HCWs participated in the current study was vaccinated against hepatitis B virus infection. Considering the risk of liver cirrhosis hepatocellular carcinoma and transmission of HBV to patients, there is need to focus efforts on reducing transmission through improving the work environment, pre-employment screening and mandatory vaccination of HCWs, strict policy on sharps and health education.

Demographic and clinical data

Characteristic		Frequency		HBsAg	
		No.	%	No.	%
Study group		**90**	**100**	**4**	**4.4**
Gender					
Male		**52**	**57.8**	**3**	**3.3**
Female		**38**	**42.2**	**1**	**1.1**
Age (Years)					
< 30		**31**	**34.4**	**1**	**1.1**
30 – 50		**34**	**37.8**	**1**	**1.1**
> 50		**25**	**27.8**	**2**	**2.2**
Occupational category					
Clinicians		**19**	**21.1**	**0**	**0.0**
Nurses		**23**	**25.6**	**1**	**1.1**
Laboratory technicians		**37**	**41.1**	**2**	**2.2**
Cleaning Staff		**11**	**12.2**	**1**	**1.1**
Risk factor					
Previous exposure to body fluids	Yes	**90**	**100**	**4**	**4.4**
	No	**0**	**0**	**0**	**0**
Previous needle stick injuries	Yes	**22**	**24.4**	**2**	**2.2**
	No	**68**	**75.6**	**2**	**2.2**
Protection					
Vaccination against HBV	Yes	**0**	**0**	**0**	**0**
	No	**90**	**100**	**4**	**4.4**

Conclusion

The results of this study suggest that HBsAg have high prevalence among HCWs. Previous exposure to body fluid, previous needle stick injuries might be the source of infection in these HCWs.

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