

Prevalence of Hepatitis B Virus and Hepatitis C Virus among Barbers at South Khartoum

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Abstract

Background: Barbers deal with sharp equipment all the time with a wide variety of clients leaving them at greater risk of exposure to hepatitis B virus (HBV), hepatitis C virus (HCV), and other harmful blood-borne pathogens.

Objective: This study aimed to determine the prevalence and knowledge of barbers on HBV and HCV among barbers at South Khartoum-Sudan.

Justification: Many hepatitis-infected individuals do not know their status and many barbers do not know that they could be transmitting or acquiring diseases during their work and how to protect themselves and their clients from contracting the diseases. Sharing contaminated sharp equipment increase the risk of transmission of HBV and HCV. Increasing the knowledge and awareness of HBV and HCV transmission routes among barbers will help in the prevention and control of new infections.

Methods: The current was a work-place based descriptive cross-sectional study conducted at South Khartoum. A structured and pre-tested questionnaire was used to collect demographic and clinical data. Enzyme-linked immunoassay (ELISA) was done to determine the presence of HBsAg and anti-HCV among 89 barbers.

The results: Among 89 barbers enrolled in this study, HBsAg was detected in 9 (10.1%), and anti-HCV was detected in 3 (3.4%). The HBsAg and anti-HCV positive rates were significantly higher in the age group of participants between 26 - 30 years. No participant has both positive results of HBsAg and HCV together.

Conclusion: High prevalence of HBV and HCV and low knowledge of viral hepatitis infections were found among barbers. Barbers in this area need to be educated on viral hepatitis and related diseases to reduce the acquisition of these infections.

Keywords: Barbers; HBV; HCV; Khartoum-Sudan; Prevalence

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Introduction

Hepatitis refers to an inflammation of the liver cells and damage to the liver. People with chronic HBV or HCV infection are at risk of developing a serious liver disease such as cirrhosis or hepatocellular cancer (HCC) (1). HBV and HCV are highly contagious and

transmission can occur via sexual or blood-blood contact (sharing of injection equipment and transfusion of unscreened blood and blood products) or vertically (from mother-to-child) (2).

Many people with hepatitis experience either mild or no symptoms, and symptoms appear

from 15 to 180 days after infection. The common signs and symptoms are diarrhea, fatigue, loss of appetite, mild fever, muscle or joint aches, nausea, abdominal pain, vomiting, weight loss, and jaundice (1). There were approximately 292 million HBV infections in 2016 globally. Of these infections, around 29 million were diagnosed, and only 4.8 million of the approximately 94 million individuals who were eligible for treatment actually received antiviral therapy (3). In fact, HBV infection is responsible for approximately 45% of HCC cases and 30% of liver cirrhosis cases (1). Approximately 80 million individuals are estimated to have chronic HCV infection, which corresponds to a global prevalence of 1.1%. Annually, an estimated 700,000 persons with chronic HCV infection die without receiving treatment (4).

The diagnosis of hepatitis can be by clinical examination, blood tests for liver enzymes, serological tests for the detection of antigens and or antibodies, and molecular techniques. Bio-marker surveys estimating the prevalence of HBsAg or antibodies to HCV are the reference methods more commonly used to measure the prevalence of HBV and HCV infections (5).

Sub-Saharan Africa is considered a highly endemic area for HBV. HBV seropositivity varies between different regions of Sudan, ranging from 5 to 8.2% among different geographical areas (6-10). The seroprevalence of the infection among health workers in Uganda has been reported to be between 8 to 11% (11). Regarding HCV, seroprevalence was

found to be ranging from 2.2 to 4.8% among the general Sudanese population (12), and up to 23.7% among hemodialysis patients (13). In a more recent study among the Sudanese population, a total of 2109 different patients were found to be infected by HBV during 2017; 1641 (77.81%) were males and 468 (22.19%) were females with the age group of 20-39 years predominating (64%). Besides, 16% of patients tested for HBeAg were found reactive, which highlights the acute phase as well as the high infectivity of the infection (14).

Treatment for viral hepatitis depends on the type and stage of the infection. Although treatment regimens exist for HBV and HCV, their efficacy is suboptimal, and problems with the cost and availability limit their use in low-resource settings (15). Globally, existing prevention and treatment interventions are estimated to have reduced the incidence of new HBV infections by 83%, thus preventing 310 million chronic infections that would otherwise have occurred between 1990 and 2020 (16).

Prevention of hepatitis can be by good hygiene and there is a highly efficient vaccine to prevent new infection by the HB viruses had been available since 1982 and is 95% safe and effective (17). Data on the prevalence, knowledge, and awareness of HBV and HCV among barbers are lacking in Sudan. This study, hence, sought to examine the prevalence and knowledge of HBV and HCV infections among barbers in the South Khartoum-Sudan.

Methods

Study design/study site: This workplace-based descriptive cross-sectional study was conducted at South Khartoum - Sudan

Study population: Eighty-nine (89) barbers working in the haircutting shops were conveniently recruited onto the study. Demographic and clinical data and knowledge on HBV and HCV infections of all barbers who were willing and consented to participate in the study were collected by face-to-face interview using a structured and pre-tested questionnaire before taking their blood samples. Participants with a history of HBV and HCV infections prior to the start of the profession were excluded.

Ethical consent: The study was approved by the Sudan International University ethical committee board and informed consent was obtained from each participant before collecting their data and samples.

Blood specimen collection: About 3 ml of venous blood was drawn from each participant, dispensed into a serum separator tube, and transported on ice to the laboratory. At the laboratory, the specimens were centrifuged at 1500 RPM for 5 minutes to obtain serum for serological testing. All sera were stored at – 20OC prior to testing.

Serological tests: The obtained sera were tested according to the manufacturer's protocol for the presence of HBsAg by enzyme-linked immunosorbent assay (ELISA) (ACON Laboratories, Inc-USA) and the presence of anti-HCV by ELISA (Fortress Diagnostics-UK). The presence of HBsAg was considered as evidence of prior exposure to HBV (Recent infection or chronic

carrier) and the presence of anti-HCV was considered as evidence of current infection or past exposure.

Statistical analysis: The data obtained from the questionnaire and sample results were entered into a database and analyzed using a statistical package for social sciences (SPSS). Descriptive statistics were reported as the mean $\pm$ SD for continuous variables and as the frequency (%) for dichotomous variables. To evaluate the relationship between different factors, we performed a chi-square analysis. Quantitative variables were compared using the independent t-test. *P. values* < 0.05 were considered statistically significant.

The Results: The age range was between 20 - 40 years with the majority between 26 - 30 years, and the mean age was 29 years. The level of education was 46% graduate, 47% secondary and only 7% primary. In expressing their knowledge of Hepatitis B and C, about 80% know about hepatitis B and C, but the majority of the group 72% do not know about the mode of transmission, and only about 3% of the respondents reported little knowledge of the signs and symptoms of hepatitis B and C. About 42% had a history of surgical and/or dental procedures; however, all participants had no history of blood transfusion. About 43% with repeated minor trauma and about 44% do not sterilize their equipment. Only about 6% of the participants were vaccinated against HBV. For HBsAg, the study revealed 9 (10.1%) positive cases and for HCV 3 (3.4%) positive cases.

The majority of the HBV and HCV positive participants were between the ages 26 - 30 years. Educational level, previous blood transfusion, previous surgical and/or dental procedures,

previous hepatitis B vaccination, minor trauma during the work, and sterilization of tools were not associated with HBV and HCV status.

Demographic characteristics, clinical and laboratory data

Characteristic	Frequency		HBV		HCV	
	No	%	No	%	No	%
Hepatitis status			9	10.1	3	3.4
Age						
20 – 25	19	21.35	0	0.0	0	0.0
26 – 30	42	47.19	6	6.8	3	3.4
31 – 35	16	17.98	1	1.1	0	0.0
36 – 40	12	13.48	2	2.2	0	0.0
Level of education						
Primary	06	06.74	1	1.1	0	0.0
Secondary	42	47.19	6	6.8	1	1.1
Graduate	41	46.07	2	2.2	2	2.3
Knowledge about hepatitis B and C						
Yes	71	79.78	8	9.0	3	3.4
No	18	20.22	1	1.1	0	0.0
Knowledge about hepatitis B and C modes of transmission						
Yes	25	28.09	1	1.1	1	1.1
No	64	71.91	8	9.0	2	2.3
Knowledge about hepatitis B and C signs and symptoms						
Yes	03	03.37	0	0	0	0
No	86	96.63	9	10.1	0	0
Previous blood transfusion						
Yes	0	0	0	0.00	0	0.0
No	89	100	9	10.1	3	3.4
Surgical and or dental procedures						
Yes	37	41.57	0	00.0	2	2.3
No	52	58.43	9	10.1	1	1.1
Vaccination against Hepatitis B						
Yes	05	05.62	0	0	0	0.0
No	84	94.38	9	10.1	3	3.4
Minor trauma during work						
Yes	38	42.70	4	4.5	3	3.4
No	51	57.30	5	5.6	0	0.0
Tools sterilization						
Yes	50	56.18	5	5.6	1	1.1
No	39	43.82	4	4.5	2	2.3
Total	89	100.00	9	10.1	3	3.4

Discussion

Many traditional and low-paid barbers in developing countries earn their livelihood by providing shaving services in unauthorized and non-conforming small marketplace and on the street side. Poor infection control during the use of sharp instruments may be a risk factor for serious blood-borne infections, potentially causing serious health problems for both the barber and the clients.

This cross-sectional study examined the prevalence of HBV infection and HCV infections among barbers in the South Khartoum-Sudan. The prevalence of HBV and HCV among the barbers were 10.1 % and 3.4 % respectively. Most of the participants had a low level of knowledge of HBV and HCV infections. The 10.1% prevalence of HBV among barbers was higher than the 4.1% prevalence among barbers in Gharbia-Egypt recorded in a cross-sectional study by Shalaby *et al.* (18), and also higher than the 5 - 8.2% prevalence among the general Sudanese population (6-10). However, it is lower than the 28% prevalence among barbers in Rabat-Morocco recorded in a cross-sectional study by Belbacha *et al.* (19), and also lower than the 14.5% prevalence among barbers in Obuasi-Ghana recorded in a cross-sectional study by Adoba *et al.* (20)

The 3.4 prevalence of HCV among barbers was higher than the 0.5% prevalence among barbers Obuasi-Ghana recorded in a cross-sectional study by Adoba *et al.* (20), and the 1.1% prevalence among barbers in Rabat-Morocco recorded in a cross-sectional study by Belbacha *et al.* (19), and fortunately within the 2.2 - 4.8%

prevalence among general Sudanese population (12). However, it is lower than the 12.5% prevalence among barbers in Gharbia-Egypt recorded in a cross-sectional study by Shalaby *et al.* (18).

The difference in prevalence rates could be due to the differences in sample sizes, geographical location, patient characteristics and sampling techniques used, lower prevalence of HCV found in this study compared to the findings of Shalaby *et al.* might be due to the differences in sample size, and the high endemicity of HCV in Egypt (18).

Adoba and colleagues (20) in a cross-sectional study to estimate the prevalence of HBV and HCV among barbers at the Obuasi-Ghana observed the highest prevalence of these viruses among barbers between the ages of 20 - 29 years. This supports the finding of the highest prevalence of HBV and HCV among barbers between the ages of 26 - 30 years in our study. The high prevalence of HBV and HCV infections among this group could be the result of risky lifestyles.

The finding of no significant association between the risk factors and HBV and HCV infections among the barbers indicates a probable high occupational risk of barbers to HBV and HCV infections.

The study revealed that the majority of barbers did not perceive themselves to be at risk of HBV and HCV infections and have little information about hepatitis B and C, but few know how the viruses are transmitted. This finding showed that the level of knowledge and awareness of barbers

about the concept of infectious risk associated with blood was generally very low. In the current study, all the participants knew that it was necessary to use a new blade for each customer and disinfect their tools, especially the sharp implements before using them on the next customer, but only 56.2% of them disinfect these tools.

The current study is limited by the small sample size, and the inability to use more sensitive and specific diagnostic methods like nucleic acid amplification techniques (NAATs) due to a lack of resources.

Conclusion

The study specifically sought to estimate the prevalence of HBV and HCV among barbers and suggested a high prevalence. Previous exposure to body fluid minor injuries with contaminated equipment, and lack of knowledge about the modes of transmission might be the source of infection in those barbers. Transmission of HBV and HCV among barbers is an underestimated route of infection due to the lack of knowledge, so more attention is needed than is currently offered and it should be mandatory to screen every barber for HBV and HCV annually.

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