



# Hepatitis B and C status among health care workers in the five main hospitals in eastern Libya



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## KEYWORDS

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**Summary** The aim of the present study was to determine the frequency of hepatitis B and C transmission to health care workers (HCWs) in five major hospitals in eastern Libya and to analyze how the risk of these infections are affected by the type of occupation, hospital work place and working period. From July 2008 to June 2009, 601 HCWs (mean age:  $32.90 \pm 8.85$  years) were tested for HBV and HCV markers using ELISA techniques. Polymerase chain reaction (PCR) was performed on all positive samples of HBsAg and Anti-HCV antibody to determine the level of HBV-DNA and HCV-RNA viremia, respectively. The overall frequency of HBsAg positivity was 1.8%. Anti-HBc, HBeAg and Anti-HBe antibodies were found in 8.5%, 0.7% and 8.0% of samples, respectively. The HBV-DNA level was positive in 55% of all HBsAg-positive samples. Approximately half of the HCWs (51.4%) were Anti-HBs antibody positive. The overall positivity rate of Anti-HCV antibodies was 2.0%, and HCV-RNA was positive in 33.3% of these samples. Overall, 52% of HCWs reported receiving full vaccination doses (three doses) against HBV infection. Among them, anti-HBs positivity was approximately 98.0%. 3.9% of those who never received any HBV vaccination dose were HBsAg positive, compared to 1.3% HBsAg positive in those HCWs who had received one or two doses of hepatitis B vaccine ( $p=0.01$  for all comparisons).

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Nurses and nurse-aides had the highest rates of both HBsAg and Anti-HCV among the studied HCWs (HBsAg: 2.1% and 3.2%; Anti-HCV: 3.2% and 4.9%, respectively). It is noteworthy that doctors also had a relatively high prevalence rate of Anti-HCV (2.2%). Obstetric wards, isolation room, dialysis units and dentist work places had higher frequencies of HBV. HCV was found to be higher in the medical and surgical wards (the prevalence varied between 3% and 5.6%). There was no significant difference between HBsAg status and the work period of HCWs. In conclusion, universal precautions should be applied for the care of all patients by all HCWs. Further, HBV vaccines should be more readily available for Libyan HCWs by reinforcing current vaccination programs. © 2014 King Saud Bin Abdulaziz University for Health Sciences. Published by Elsevier Ltd. All rights reserved.

## Introduction

Hepatitis B virus (HBV) and hepatitis C virus (HCV) are among the main causes of liver-associated diseases, including liver cirrhosis and hepatocellular carcinoma [1,2]. Both viruses are major global public health problems warranting high priority efforts for prevention, control and treatment. Approximately two billion individuals worldwide have been infected by HBV, and between 350 and 400 million individuals have chronic HBV infection [3], while an estimated 200 million people (i.e., 3.3% of the world's population) are chronically infected by HCV worldwide [4]. A majority of countries in the Middle East show an intermediate or high endemicity of HBV infection, which clearly poses a serious public health problem in the region [5]. The prevalence of HBV and HCV in Libya has been recently reported in a large general population-based study to be 2.2% for HBsAg and 1.8% for Anti-HCV antibodies [6].

The modes of transmission of these two blood-borne viruses in developing countries include perinatal transmission or household contact, while sexual contact, shared needles in intravenous drug abusers and contaminated blood or organ transplants are responsible for their transmission in developed countries [7]. However, screening tests as well as vaccination for HBV have dramatically reduced the risk of transmission worldwide [8].

Occupational exposure to HBV and HCV is a well-recognized risk for health care workers (HCWs). The assessment of the risk of transmission to HCWs requires information derived from various sources including the place of HCW hospital work, the working period, the type of occupation, and the rate of exposure to patient blood and blood products [9]. The rates of transmission of HBV and HCV to HCWs are also influenced by the prevalence of HBV and HCV infection in the general population.

In developing countries, the prevalence of HBV and HCV among HCWs is high, while the vaccination status among HCWs and its relationship with occupational factors are not well documented [10,11]. Because the information regarding transmission of blood-borne viruses in HCWs is very limited in Libya we decided to determine the frequency of HBV and HCV transmission to HCWs in the five major hospitals in eastern Libya. A further aim of this study was to analyze how the risk of these infections are affected by the type of occupation, the place of work in the hospital and the working period as well as the vaccination status among this high risk group.

## Materials and methods

### Study population

The present study was conducted from July 2008 to June 2009 on 601 HCWs from five major hospitals in the three main cities in eastern Libya. There were 116, 120, 100, 152 and 113 HCWs from various professional categories who were randomly selected to represent the 1007, 455, 556, 405 and 680 HCWs in the Aljomhoria Hospital and Children's Hospital (Benghazi), Althawra Hospital (Albaida), Alwahda Hospital (Derna), and Albutnan Medical Center (Tubruk), respectively.

HCWs were defined as workers at risk of needle sticks or other sharps injuries in the hospitals. This definition included physicians, dentists, nurses, midwives, laboratory technicians, nursing aids, medical assistants, and cleaners. They were randomly selected from different places of work in these hospitals to include operation theaters, labor rooms, dental clinics, laboratories, endoscopy units, nephrology units, coronary care units (CCUs), intensive care units (ICUs), surgical and medical wards, and out-patient departments, as well as

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