



The Seroprevalence of HBV and HCV Infection in Newly Recruited Police in Duhok city, Kurdistan Region, Iraq

Nawfal R Hussein ^{a*}, Azad M. Taher ^b

^a*Department of internal medicine, school of medical sciences, faculty of medicine, University of Duhok, Duhok, Iraq.*

^b*Department of Medical Lab Technology, Shekhan Technical college of health, Duhok Polytechnic University, Duhok, Iraq.*

^a*Email: nawfal.hussein@yahoo.com*

^b*Email: azad_duhoki@yahoo.com*

Abstract

In developing countries such as Iraq, hepatitis B (HBV) and C virus (HCV) are leading health care problems. The aim of this paper was to evaluate the frequency of HBV and HCV in healthy individuals selected for the recruitment in police services in Duhok city. In the study, blood samples from 566 candidates of police recruitment were collected and tested for HBV surface antigen (HBs Ag) and HCV antibody (AB) positivity by ELISA. It was found that 41/566 (7.2%) subjects were positive for HBs Ag. None of the recruited subjects was positive for HCV AB. To conclude, the prevalence of HBs Ag positivity was high in newly recruited police officers. Further study recruiting larger sample size is needed to confirm such a result.

Keywords: HBV; HCV; Iraq; Duhok

1. Introduction

Viral hepatitis is a global public health problem. In developing countries such as Iraq, HBV and HCV are leading health care problems [1-3].

* Corresponding author.

E-mail address: nawfal.hussein@yahoo.com

Worldwide, it is estimated that 350 million subjects are chronically infected with HBV while 170 million subjects are chronically infected with HCV [1-3]. Both HBV and HCV are blood borne viruses and can predispose to liver cirrhosis and hepatocellular carcinoma [1-3].

Based on the prevalence of carriers of hepatitis B surface antigen in the general population, countries are classified as having high (>8%), intermediate (2-7%), or low endemicity (< 2%) [3, 4]. Iraq is amongst the countries of intermediate prevalence [5]. Some group, for example those who are on haemodialysis, transplants, and multiple blood transfusions, drug users and healthcare workers are at increasing risk of acquiring the infection [6, 7]. In a study conducted in Europe, it was shown that about 85% of vaccine went to the healthcare workers, who account for only 5 to 10% of reported cases of hepatitis B. While healthcare workers should certainly be immunised, this high risk strategy will not control hepatitis B on a population basis [8]. Identification of high risk group in the community is needed and should be targeted by a vaccination programme.

Blood-borne diseases including HBV and HCV among prison inmates are higher than the general population [9]. This high prevalence might be due to drug using and high-risk addiction-related behaviors, having multiple sexual partners and homosexuality, prison life style and limited educational opportunities of this population group [9]. On the other hand police officer and due to the nature of their work are at increased risk of HBV and HCV [10]. Although occupational exposures of blood borne pathogens are well studied in health care providers, limited data exists to assess occupational exposures to police officers. Also, base line information should be available about the prevalence of infection with these viruses in this group. In this paper, we aimed at studying the prevalence of HBV and HCV in candidates for police recruitment in Duhok city, Kurdistan region, Iraq.

2. Materials and Methods

2.1 Blood Samples

A cross-sectional study was conducted in Duhok city. All newly recruited police officers were recruited in this study. A 5cc syringe and needle were used to bleed approximately 5 ml of blood from each donor. Then the blood samples were centrifuged at 1500 rpm for 3 min to obtain serum.

2.2 ELISA

The HCV AB (fourth generation) and the hepatitis B-specific HBs antigen were studied by commercial DIA.PRO diagnostic Bioprobes ELISA kit (Italy) following manufacturer's instruction. A mouse monoclonal antibody specific for HBsAg is fixed to the surface of microwells. Patient's serum was added to the micro-well with a mouse monoclonal antibody specific for HBsAg together with a second mouse monoclonal antibody, conjugated with Horseradish Peroxidase (HRP). Then micro-wells were washed to remove unbound serum proteins and HRP conjugate. The substrate was then added after blocking the enzymatic reaction; its optical density was measured by an ELISA reader.

Fourth generation enzyme immunoassay for the determination HCV AB was used. Microplates were coated with HCV-specific antigens derived from core peptide, recombinant NS3, NS4 and NS5 peptides. Serum samples were then added and HCV AB were captured, if present, by the antigens. After washing out all the other components of the sample, in the 2nd incubation bound HCV antibodies, IgG and IgM as well, were detected by the addition of polyclonal specific antibodies labelled with peroxidase (HRP). The substrate was then added after blocking the enzymatic reaction, its optical density was measured by an ELISA reader.

2.3 Ethics

The research protocol was approved by the Ethical committee of polytechnique university of Duhok.

3. Results

3.1 Characteristics of donors

Over the period of the study from February to May 2015, 566 subjects were screened for HBs Ag and HCV AB. Among them, 453 were male and 113 were female. The average age of our subjects was 25±13 years.

3.2 HBs Ag and HCV AB positivity

It was found that 41/566 (7.2%) subjects showed positive results for HBs Ag (table 1). The prevalence of HBs Ag positivity was 13/113 (11.5%) in female while it was 28/453 (6%) in male. None of the recruited subjects was positive for HCV AB.

Table 1: The distribution of HBV cases according to the age

Age in year	No of cases
18-19	3
20-29	20
30-39	11
>40	7
Total	41

4. Discussion

HBV and HCV are transmitted easily through parenteral route with infected blood and secretions. In two reports studying the prevalence of HBV positivity in Iraq (Babylon and Najaf cities), the prevalence was found to be around 0.7%, while the prevalence was found to be as high as 3.5% in Kerbala [11, 12]. In a study conducted in Egypt recruiting healthy volunteer blood donors, HBV positivity was found in 5% of the donors [13]. Similarly,

in a study conducted in Kuwait, the prevalence of HBsAg positivity amongst Kuwaiti nationals and non-Kuwaiti Arab was found to be 1.1% and 3.5%, respectively [14]. In another study conducted in Saudi, it was found that the HBV positivity was 3.8% [15]. Police officers are at high risk of HBV and HCV. This probably due the nature of their work and may reflect increases in the prevalence of blood borne viral infection. In a previous study, the prevalence of HBV was studied in officers before the engagement in their duties and few officers showed positivity afterward, which suggested unreported exposure [10]. It was shown also that the group most at risk was officers on ordinary street duty [10]. In our study, it was found that the prevalence of HBV was 7.2%. This is much higher than that reported previously in the community. Different reports showed that the prevalence of HBV in Iraq is around 2%. This high prevalence might be due to that the sample was not collected randomly and further population based study is needed to determine the prevalence of HBV. The prevalence of HCV is very low in Iraq [5, 16]. In our study, none of the subjects showed positive results for HCV AB. This might return back to the relative small sample size recruited in this study. Our study is important because it gave baseline information about the prevalence of prospective police officers who would be in a risk of HBV and HCV due to the nature of their job. Our study has limitations. First, and perhaps most importantly, we studied the prevalence of HBV and HCV in a special group and this did not reflect the prevalence of the community. Also, our sample was small and from a limited geographical region and therefore it might not reflect the prevalence in whole Iraq. It is recommended that further study with a larger sample from different geographical region of Iraq to be performed. Most officers can avoid contamination with hepatitis B by adopting precautions such as taking care with needles and wearing gloves when dealing with bleeding accident victims. Moreover, vaccination programme should be considered to cover this group.

5. Conclusions

Our study was performed to estimate the prevalence of HBV and HCV in newly recruited police officers. It was found that around 7% of the tested population was positive for HBV while none of the tested subjects was infected with HCV. The prevalence of HBV in this group seemed to be higher than the general population of Iraq. Further study is needed recruiting larger sample to explore this subject.

References

- [1] K. Mohd Hanafiah, J. Groeger, A. D. Flaxman, and S. T. Wiersma, "Global epidemiology of hepatitis C virus infection: New estimates of age-specific antibody to HCV seroprevalence," *Hepatology*, vol. 57, pp. 1333-1342, 2013.
- [2] J.-H. Kao, "Molecular Epidemiology of Hepatitis B Virus," *The Korean Journal of Internal Medicine*, vol. 26, pp. 255-261, 2011.
- [3] J.-H. Kao and D.-S. Chen, "Global control of hepatitis B virus infection," *The Lancet Infectious Diseases*, vol. 2, pp. 395-403, 2002/06/24 2002.
- [4] Y.-F. Liaw and C.-M. Chu, "Hepatitis B virus infection," *The Lancet*, vol. 373, pp. 582-592, 2009.

- [5] H. A. Khaleel, A. M. Turkey, A. S. Al-Naaimi, R. W. Jalil, O. A. Mekhlef, S. A. Kareem, N. Y. Hasan, and A. A. Dhadain, "Prevalence of HBsAg and anti HCV Ab among patients with suspected acute viral hepatitis in Baghdad, Iraq in 2010," *Epidemiology Reports*, vol. 1, 2014/02/08/06:25:34 2014.
- [6] S. M. Alavian, S. V. Tabatabaei, T. Ghadimi, F. Beedrapour, S. A. Kafi-abad, A. Gharehbaghian, and H. Abolghasemi, "Seroprevalence of Hepatitis B Virus Infection and Its Risk Factors in the West of Iran: A Population-based Study," *International Journal of Preventive Medicine*, vol. 3, pp. 770-775, 2012.
- [7] K. Stark, U. Bienzle, R. Vonk, and I. Guggenmoos-Holzmann, "History of syringe sharing in prison and risk of hepatitis B virus, hepatitis C virus, and human immunodeficiency virus infection among injecting drug users in Berlin," *International journal of epidemiology*, vol. 26, pp. 1359-1366, 1997.
- [8] P. Van Damme, M. Kane, and A. Meheus, "Integration of hepatitis B vaccination into national immunisation programmes. Viral Hepatitis Prevention Board," *BMJ : British Medical Journal*, vol. 314, pp. 1033-1036, 1997.
- [9] D. Dana, N. Zary, A. Peyman, and A. Behrooz, "Risk Prison and Hepatitis B Virus Infection among Inmates with History of Drug Injection in Isfahan, Iran," *The Scientific World Journal*, vol. 2013, p. 4, 2013.
- [10] P. Morgan-Capner, P. Hudson, and A. Armstrong, "Hepatitis B markers in Lancashire police officers," *Epidemiology & Infection*, vol. 100, pp. 145-151, 1988.
- [11] A. Al – Juboury, H. M. Salih, M. AL- ASSADI, and A. M. Ali, "Seroprevalence of Hepatitis B and C among Blood Donors in Babylon Governorate-Iraq," *Medical Journal of Babylon* vol. 7, 2010.
- [12] A. K. A. Mahmood, S. A. Addose, H. M Salih, and A. Al- Khadi, "seroprevalence of HBs ag and Anti HCV positive blood donors in Najaf governorate " *Iraqi J.comm. med*, vol. 14, pp. 29-33, 2001.
- [13] H. Awadalla, M. Ragab, M. Osman, and N. Nassar, "Risk Factors of Viral Hepatitis B among Egyptian Blood Donors " *British Journal of Medicine & Medical Research*, vol. 1, pp. 7-13, 2011.
- [14] R. Ameen, N. Sanad, S. Al-Shemmari, I. Siddique, R. I. Chowdhury, S. Al-Hamdan, and A. Al-Bashir, "Prevalence of viral markers among first-time Arab blood donors in Kuwait," *Transfusion*, vol. 45, pp. 1973-1980, 2005.
- [15] S. Mohammed Abdullah, "Prevalence of Hepatitis B and C in Donated Blood from the Jazan Region of Saudi Arabia," *The Malaysian Journal of Medical Sciences : MJMS*, vol. 20, pp. 41-46, 2013.
- [16] N. R. Hussein, "Prevalence of HBV, HCV and HIV and Anti-HBs Antibodies Positivity in Healthcare Workers in Departments of Surgery in Duhok City, Kurdistan Region, Iraq," *International Journal of Pure and Applied Sciences and Technology*, vol. 26, p. 70, 2015.
- [17] K. Fokianos, I. Sarrou, and I. Pashalidis, "Increased radiation exposure by granite used as natural tiling rock in Cypriot houses," *Radiation Measurements*, vol. 42, pp. 446-448, 2007.