



A Study of Hepatitis B Virus Associated Risk Factors in Patients Attending Hepatitis Unit in Duhok City, Iraq

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Abstract

Background: Infection with HBV is a major public health problem. Determining the risk factors of such an infection is of great importance for a preventive public health plan.

Objectives: This study was conducted to determine the clinical presentations of patients with HBV, to assess the knowledge of patients about the mode of transmission of the infection, and to estimate the prevalence of risk factors associated with HBV infection.

Methods: A cross-sectional study was performed among patients with HBV attending hepatitis unit in Azadi teaching hospital, Duhok city, Iraq. A total of 423 patients were recruited in the study over the period of January 2013 to December 2015. Data collection was performed by a face-to-face interview using a questionnaire sheet for the collection of personal information, data regarding the knowledge about mode of transmission of HBV, and data about risky behaviors.

Results and Conclusions: 287/423 (68%) of the recruited subjects were males, 141/423 (33%) were from the central area in Duhok, and 216/423 (51%) were married. Additionally, 375/423 (88.7%) of the patients were asymptomatic. 383/423 (90.5%) of the recruited subjects claimed that they do not know the risk factors of HBV transmission. 85/423 (20.1%) of the recruited subjects gave a history of previous surgical operation and 73/423 (17.2%) of the patients gave a history of dental surgery.

Conclusions: Our study has given an insight into the most common risk factors associated with HBV infection. Furthermore, it has shown a lack in knowledge regarding HBV. A comprehensive population based program is needed to combat the spread of infection and early detection of HBV infection especially in rural and remote areas.

Keywords: HBV, Coinfection, Iraq, Duhok, Risk Factors

1. Background

Infection with hepatitis B virus (HBV) is a major global health problem (1). It is estimated that about 350 million people are chronically infected worldwide (2). The prevalence of HBV varies from less than 1% in the developed world to more than 8% in some Asian countries (3-5). The prevalence of HBV has been studied in Iraq and it was found that HBsAg positivity was around 1% (6-8). Chronic HBV infection may predispose to liver cirrhosis, liver failure, and hepatocellular carcinoma. It is estimated that more than half a million subjects worldwide die annually from HBV and its complications (2). Early diagnosis of HBV may prevent such complications and is associated with a better prognosis (2). However, the majority of the patients are asymptomatic, which makes the early diagnosis extremely difficult. Additionally, the diagnosis, the treatment, and the follow up of such an infection increase the economic burden on the healthcare providers, especially

in developing countries. To prevent the infection and subsequently the complications of HBV infection, each country should put preventive plans to combat the transmission of the viral infection and overcome the challenge of early detection. In addition, HBV infection is a preventable disease and can be prevented by 3 doses of vaccination (3). Furthermore, it can be prevented by educational programs by teaching the population about the risk factors of acquiring the infection and how to avoid them (3). Healthcare planners have put a plan to eliminate HBV from the country by 2030. No study has been conducted in the region to determine HBV-associated risk factors. Although HBV can be transmitted via direct contact with blood, transfusion of blood and blood products, intravenous injections, and unprotected sex (9), the prevalence of risk factors differs from a society to another according to the norms and traditions of that society (10-12). Therefore, for the establishment of public health plan to combat HBV infection, deter-

mining the risk factor of infection transmissions in a society is of great importance.

2. Objectives

The aims of this study were to determine the clinical presentations of patients with HBV, to assess the knowledge of patients regarding the mode of transmission of the infection, and to estimate the prevalence of risk factors associated with HBV infection.

3. Methods

3.1. Blood Samples

This study recruited all patients with HBV who had been referred to the infectious disease unit in Azadi teaching hospital from January 01, 2013 to December 31, 2015. Azadi teaching hospital is governmental tertiary hospital serving 2 million people in Duhok city, Northern Iraq. The vast majority of these patients were referred from screening programs such as premarital screening and pre-military screening programs. 5 cc of blood from each patient was collected using a syringe. Then, the blood samples were centrifuged at 1500 rpm for 3 minutes to obtain serum.

3.2. Questionnaire

A questionnaire sheet was prepared and used for each study subject. Data were collected by a face-to-face interview. This was used to collect personal information (age, sex, residency, and marital status). One knowledge question was asked whether the participant knew about the mode of transmission of HBV or not. Then, all patients were asked about the history of exposure to risky procedures or behaviors, family history of HBV infection, and history of immunization against HBV in 3 doses. All patients were also asked about the symptomatology and presentation of infection.

3.3. HBsAg and HbCAb ELISA

HBsAg and HbCAb were studied by commercial LI-AISON® XL diagnostic system (USA) following manufacturer's instruction. First, specific monoclonal antibodies (anti HBsAg and anti HbCAb) were fixed to the surface of micro-wells. Subjects' sera were then added to the micro-well and secondary conjugated monoclonal antibodies, conjugated with Horseradish Peroxidase (HRP), were added. Unbound serum proteins and HRP conjugate were then washed off. The substrate was added after blocking the enzymatic reaction and optical density was measured by an ELISA reader.

3.4. Statistics

Data were introduced and analyzed utilizing the statistical package for social sciences (SPSS) for windows version 21 software (IBM Inc., Chicago, IL, USA). Descriptive statistics and percentage were employed.

3.5. Ethics

The study was approved by the Scientific and ethics committee, college of Medicine, University of Duhok and Blood bank, Duhok, Kurdistan region, Iraq. Written informed consent was obtained from all subjects before data collection.

4. Results

4.1. Clinical and Demographic Data

During the period of study, 423 patients with HBsAg positive test were referred to the infectious disease unit with an age mean of 29.6 ± 13 years. 287/423 (68%) were males, 141/423 (33%) of the patients were from central area in Duhok while all others were from rural area, and 216/423 (51%) were married (Table 1). 375/423 (88.7%) of the patients were asymptomatic and 44/423 (10.4%) presented with jaundice including the patients with acute HBV (Table 1). 22/423 (5.2%) of the patients gave a history of receiving 3 doses of the HBV vaccine.

Table 1. Characterization and Clinical Presentations of HBV Patients

	No. (%)	95% Confidence Interval
Male	287 (67.8)	63.4-72.3
City resident	141 (33.3)	28.8-37.8
Married	207 (48.9)	44.1-53.7
Clinical presentation Jaundice	44 (10.4)	7.5-13.3
Fever	18 (4.3)	2.4-6.2
Abdominal pain	20 (4.7)	2.7-6.7
Loss of appetite	20 (4.7)	2.7-6.7

4.2. Determination of HBsAg and HbC AB

To confirm the positivity, blood samples were taken and examined for HBsAg and all were positive. Then, to discriminate between acute and chronic infections, blood samples were tested for HbC IgM and HbC IgG. Three samples were found positive for HbC IgM indicating acute infection.

4.3. Risk Factors and Knowledge of Risk Factors

All subjects were interviewed and asked about the exposure to the risk factors of HBV. First, the patients were asked whether they know the risk factors of HBV transmission or not. 383/423 (90.5%) of the recruited subjects claimed that they do not know the risk factors of HBV transmission. Then, patients were asked about the history of specific risk factors. 85/423 (20.1%) of the recruited subjects gave a history of previous surgical operation while only 11/423 (2.6%) of the subjects had positive history of tattooing (Table 2). On the other hand, 73/423 (17.2%) of the patients gave a history of dental surgery (Table 2).

Table 2. History of Risk Factors Associate with HBV Infections

Risk Factor	No. (%)	95% Confidence Interval
History of blood	23 (5.4)	3.3 - 7.6
History of street drugs	1 (0.2)	0 - 0.6
History of dental surgery	73 (17.2)	13.6 - 20.8
History of surgical procedures	85 (20.1)	16.3 - 23.9
Tattoo	11 (2.6)	1 - 4.1
History of accidental injury	8 (1.9)	0.6 - 3.2
Alcohol intake	7 (1.7)	0.5 - 2.9
Family history of HBV	34 (8)	5.4 - 10.6
History of dialysis	4 (0.9)	0 - 1.8
History of Hospitalization	13 (3.1)	1.5 - 4.8
History of Illegitimate sex	4 (0.9)	0 - 1.8

5. Discussion

Infection with HBV is a public health problem. Although the infection rate in Iraq is as low as 1%, without an effective preventive program, the infection rates may escalate. Early detection of HBV infection is essential to prevent deleterious consequences of such an infection and to prevent the spread of the virus. In this study, we investigate the presenting symptoms in patients with HBV. Unfortunately, the majority of patients recruited in this study were asymptomatic. This warrants a strong screening program to detect such asymptomatic patients. Furthermore, determining risk factors in our society may give significant information to the infection control department and health planners to control the spread of such an infection. Previously, it was found that unsterilized surgical instruments and dental tools were associated with outbreaks of blood borne viral infection in private clinics and hospitals (9). In our study, it was found that around 20% of patients infected with HBV gave a history of visiting dentists and undergoing previous surgery. This may warrant a thorough

investigation regarding sterilization methods in all hospitals and dental clinics. Additionally, drug users and subjects with history of illegitimate sex are at a high risk of acquiring HBV (13). In studies conducted in Egypt and Iran, the history of drug use was found in 28% and 8.3% of HBsAg positive subjects, respectively (14, 15). On the other hand, in a study conducted in Iran, 17.4% of the HBV positive cases gave a history of extramarital sexual contact (15). In our study, less than 1% of the recruited sample gave a history of drug use or illegitimate sexual relationship. This might be due to the rarity of these behaviors in the region or the embarrassment of admitting the involvement in such practices. More studies are needed to explore this area using different methods of data collection. In addition, toothbrushes, razors, and some other house-holding instruments can transmit HBV within the family (16). In our study, it was found that 8% of involved patients gave a positive family history of HBV infection. Lack of education regarding the method of transmission may have helped the spread of infection. Previously, it was shown that having knowledge about any disease, especially contagious, might help decreasing the spread of that disease (17). In a study conducted in Singapore, it was shown that 70% of the participants knew about the mode of transmission of HBV (18). In contrast, in the USA, several studies investigated the knowledge of Asian minorities about HBV. It was found that the knowledge of recruited subject was low about the means of transmission of HBV (19). In agreement of this, 90% of subjects involved in our study claimed that they do not know about the mode of transmission of HBV. Therefore, healthcare providers should put more efforts in education programs to stop the spread of HBV. Additionally, it was previously found that the prevalence of HBV is higher in rural area than that found in cities (20, 21). In agreement of this, the vast majority of our patients were from the rural and remote area. Again, this might be due to the lack of education programs and vaccination facilities. Any education program should cover those areas with high incidence of the infection.

Hepatitis B vaccines are typically given in a 3-dose series (3). It was previously shown that the success rate of HBV vaccination in the Kurdistan regions was 85% (6). Surprisingly, 20 subjects with HBV claimed that they received a full vaccination. It was not clear whether those subjects did a test for HBV before getting immunized and acquired the infection before the vaccination or it was a vaccination failure.

Our study had several limitations. First, only positive cases of HBV were recruited and therefore it is difficult to make a clear statement about the risk factors. However, this study has given an insight into the common risk factors associated with the HBV infection. A case control study

involving HBV negative subjects is required to determine the risk factors of such an infection. Second, data was collected by a questionnaire through an interview. This might have caused embarrassment for some patients, especially when they were asked about sexual behaviors and drug uses. Probably, an anonymous self-filling questionnaire would avoid such an issue.

In conclusion, this is the first study in our study examining the risk factors for HBV. Our study has given an insight into the most common risk factors associated with the HBV infection. This would help public health planners to determine the most common risk factors for HBV in the region, which helps the elimination of the virus. In addition, it has been suggested that there was a deficit in knowledge about HBV. A comprehensive population based program is needed to combat the spread of infection and early detection of HBV infection especially in rural and remote areas.

Footnote

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