

# Prevalence of Hepatitis B, C and HIV Viruses among Hemophiliac Patients in Al-Anbar Governorate

Hussein Ali AL-Enzy<sup>1</sup> Fakhri Jamil Al-Dalla Ali<sup>2</sup>, Adnan M Jasim<sup>3</sup>

<sup>1</sup>Dr. CIB/Specialist/ Pediatric Department/ Ramadi Teaching Hospital For Gynecology And Childhood/ Ramadi city/Iraq, <sup>2</sup> Dr. Assist Prof. / University of Anbar/ College of medicine/Iraq, <sup>3</sup>D.C.H./Specialist/ Pediatric Department/ Ramadi Teaching Hospital for Gynecology and Childhood/Iraq

## Abstract

**Background:** People with hemophilia (factor VIII and IX deficiency) and those with other clotting factor deficiencies are particularly at risk of acquiring blood-borne hepatitis virus infections and HIV through transfusion with unscreened blood and blood products.

**Objective:** To estimate the prevalence of hepatitis B, C, and HIV among hemophiliac patients in the Al-Anbar governorate.

**Patients and methods:** A cross-sectional study carried out between October 2014 and March 2015 was done to estimate the prevalence of hepatitis B, C, and HIV among hemophiliac patients. Forty hemophiliac patients were recruited to this study, who were documented to have hemophilia A and B by factor assay. Patients' surveillance for hepatitis B, C and HIV were done by the electrochemiluminescence immunoassay "ECLIA" by using Cobas e 411-immunoassay analyzer.

**Results:** Forty hemophiliac patients with age ranged between 6 months and 22 years with mean age  $9.9 \pm 5.4$  years were recruited to this study, 5 patients were mild hemophilia, 6 patients moderate hemophilia and 29 patients with severe hemophilia.

The prevalence of hepatitis C among the 40 hemophiliac patients was 5%, while for hepatitis B and HIV was 0%. Six patients (15%) showed immunity to hepatitis B due to successful vaccination.

**Conclusions:** This study showed that the prevalence of hepatitis B and HIV is zero, while for hepatitis C 5%. Hepatitis C infection was more in severe hemophilia A, advanced age and an increasing number of blood and blood products transfusion. Only 6 patients (15%) among hemophiliac patients were seropositive for hepatitis B vaccine immunity.

**Keywords:** Hepatitis B, Hepatitis C, HIV, Hemophilia, Al-Anbar.

## Introduction

Hepatitis B, C, and HIV viruses are worldwide healthcare problems, especially in developing countries. It is estimated that approximately 33% and 3% of the global population has been infected with HBV and

HCV, respectively <sup>1,2</sup>.

Hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) infections are the most important complications of transfusion <sup>3</sup>.

A significant proportion of the blood supply is either not screened for hepatitis B or C virus or not screened properly. The probability of transmission of hepatitis B and C viruses through transfusion of unsafe blood can be as high as about 70% and 92%, respectively, depending

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**Corresponding author:**

Hussein Ali AL-Enzy  
drhah214417@gmail.com

on the volume transfused and the concentration of virus<sup>4</sup>.

Sensitive screening tests and efficient virus inactivation methods both decrease the risk of infection due to transfusion substantially; however, it cannot be possible to prevent it entirely<sup>5, 6</sup>. In spite of the combination of the most sensitive tests, an estimated risk of transfusion-transmitted hepatitis still exists in 1 in 200000 – 500000 units transfused for HBV and 1 in 2000000 units transfused for HCV and HIV<sup>5,7</sup>.

People with hemophilia (factor VIII and IX deficiency) and others with other clotting factor deficiencies are particularly at risk of acquiring blood-borne hepatitis virus infections i.e. hepatitis B virus (HBV) and hepatitis C virus (HCV) through transfusion with unscreened blood and blood products<sup>8,9</sup>.

Viral hepatitis places a heavy burden on the health care system because of the costs of treatment of liver failure and chronic liver disease. In many countries, viral hepatitis is the leading cause of liver transplants. Such end-stage treatments are expensive, easily reaching up to hundreds of thousands of dollars per person<sup>10,11</sup>.

A large-scale study of HBV, HCV, and HDV seromarkers in hemophiliacs has confirmed that these diseases continue to be prevalent in this population. Ongoing longitudinal studies should provide additional information regarding incidence rates of HBV, HCV, and HDV, the clinical course of hepatitis in hemophiliacs, and the impact of currently used factor replacement products<sup>12</sup>.

### **Aim of the Study**

To estimate the prevalence of hepatitis B, C, and HIV among hemophiliac patients in the Al-Anbar governorate.

### **Patients and Method**

A cross-sectional study was carried out between October 2014 and March 2015 in Al-Ramadi teaching hospital for maternity and children for documenting the prevalence of hepatitis B, C, and HIV viruses among hemophiliac patients who are registered in Al-Anbar hemophiliac center.

Inclusion Criteria: Hemophiliac patients diagnosed by factor VIII and IX assay.

Exclusion Criteria: Suspected hemophiliac patients not diagnosed with factors assay.

The history including name, age, residence, type and severity of hemophilia, age of diagnosis, duration of disease and number of blood and blood products transfused and history of hepatitis B vaccination. The severity of hemophilia was classified as: (Severe hemophilia having <1% activity of the specific clotting factor, moderate hemophilia have factor levels of 1-5% mild hemophilia >5%)<sup>13,14</sup>.

After taken permission from the patient's parents or patient for examination and blood investigation, venous blood samples were aspirated from 40 hemophiliac patients during regular follow-up using a sterile plastic syringe and samples placed in tubes containing separating gel. The blood samples were centrifuged for 10 minutes to get a clear serum. The serum was placed in sterile covered storage tubes and stored at -20°C until the collection of all samples. And then viral serology for hepatitis B, C and HIV were done by the electrochemiluminescence immunoassay "ECLIA" by using Cobas e 411-immunoassay analyzer from ROCHE HITACHI Company, Germany.

Hepatitis B serology including HBS antigen, Anti-HBS antibody and anti-HBC antibody (Routine screening for HBV infection requires assay of  $\geq 3$  serologic markers (HBsAg, anti-HBc, anti-HBs). HBsAg indicates infected persons. Anti-HBc IgM indicates acute infection. The presence of only anti-HBs indicates immunized persons with hepatitis B vaccine. Anti-HBs and anti-HBc IgG antibodies are detected in persons with resolved infection. The presence of both HBsAg and anti-HBs indicates acute infection. Presence of HBsAg, anti-HBs, and anti-HBc IgG antibodies indicate chronic infection<sup>15</sup>. The detection of HCV infection was based on the detection of antibodies to HCV antigens.<sup>16</sup> Detection of HIV infection was based on the detection of antibodies to HIV and the detection of HIV antigens<sup>17</sup>.

Descriptive analysis was done by using range, mean, standard deviation and percentage.

### **Results**

Forty hemophiliac patients were recruited to this

study. The age of the patients ranged between 6 months and 22 years with a mean age ( $\pm$  SD) was  $9.9 \pm 5.4$  years as shown in table 1.

All studied patients were males. Thirty patients (75%) were hemophilia A while 10 of them (25%) were hemophilia B. The geographical distribution of the patients is shown in table 2. Twenty patients (50%) were from the AL-Ramadi district, 9 patients (22.5%) were from the AL-Fallujah district, 8 patients (20%) from the AL-Garmah district, and 2 patients (5%) from Heet district and 1 patient (2.5%) from Haditha district.

The distribution of patients according to the types and severity of hemophilia was shown in table 3.

The distribution of the study sample according to the type of hemophilia and frequency of receiving blood &/or blood products as shown in table 4.

Serology for hepatitis B among the studied 40 hemophiliac patients were negative for both HBs antigen and anti-HBc antibodies (IgM, IgG) while anti-HBS antibody was positive in 6 patients (15%) reflecting immunity due to vaccination. The serology for HIV infection was negative.

Out of 40 hemophiliac patients, two patients were positive for HCV antibodies, giving a prevalence rate of 5%. The two infected patients were severe type hemophilia A, the age of the first one was 16 years old and the second was 22 years. Both of them received blood and blood products transfusion more than 40

times.

**Table 1: distribution of hemophiliac patients according to age group.**

Age group (years)	No. of patients (%)
<3	5 (12.5%)
3-8	8 (20%)
9-14	12 (30%)
15-22	15 (37.5%)
Total	40 (100%)

**Table2: Geographical distribution of hemophiliac patients.**

Residence	No. of patients (%)
AL-Ramadi district	20 (50%)
AL-Fallujah district	9 (22.5%)
AL-Garmah district	8 (20%)
Heet district	2 (5%)
Haditha district	1 (2.5%)

**Table 3: distribution of hemophiliac patients according to types and severity of hemophilia.**

Severity of hemophilia	No. of hemophilia A (%)	No. of hemophilia B (%)	No. of patients (%) Hemophilia A / B
Mild	3 (10%)	2 (20%)	5 (12.5%)
Moderate	4 (13.33%)	2 (20%)	6 (15%)
Severe	23 (76.67%)	6 (60%)	29 (72.5%)
Total	30 (100%)	10 (100%)	40 (100%)

**Table 4: Distribution of the study sample according to the type of hemophilia and frequency of receiving blood &/or blood products.**

No. of blood and blood Products transfusion/ Unit	No. of patients (%)	Type of hemophilia					
		A			B		
		Mild	Moderate	Severe	Mild	Moderate	Severe
<20	6 (15%)	3(7.5%)	1 (2.5%)	0 (0%)	2(5%)	0 (0%)	0 (0%)
20-40	14(35%)	0 (0%)	3 (7.5%)	7(17.5%)	0(0%)	2 (5%)	2(5%)
>40	20 (50%)	0 (0%)	0 (0%)	16(40%)	0(0%)	0(0%)	4 (10%)
Total	40(100%)	3(7.5%)	4(10%)	23(57.5%)	2(5%)	2(5%)	6 (15%)

### Discussion

The prevalence of hepatitis B and C in Iraq according to WHO-supported study in 2006 was 1.6% (low) and 0.1% (very low) respectively<sup>18</sup>. , While HIV prevalence was less than 0.1%<sup>19</sup>.

Haemophiliac patients are at increased risk of acquiring hepatitis and HIV viruses' infections due to repeated blood or blood product transfusion<sup>8</sup>. However, this risk dramatically decreased since 1992 due to a more sensitive screening test for blood donors and advanced procedures to inactivate viruses in clotting factor concentrate<sup>9</sup>.

The present study showed that the prevalence of hepatitis B, C and HIV infections among hemophiliac patients was 0%, 5%, and 0% respectively. The prevalence of hepatitis C (5%) in this study is lower than that reported in Baghdad (9.9%)<sup>20</sup>, Iran (22.6%)<sup>21</sup>, and Egypt (39%)<sup>22</sup>, while it is higher than that reported in Turkey (3%)<sup>23</sup>. in USA the prevalence of hepatitis virus was 17.2% in 1968 and dropped to nearly zero by 1990<sup>10</sup>.

The finding of 0% of hepatitis B virus among hemophiliac patients is similar to that found in Turkey<sup>23</sup>, while other studies showed (0.52%) in Baghdad<sup>20</sup>, (0.4%) in Iran<sup>21</sup>, (0.43%) in India<sup>24</sup> and (18%) in Egypt

<sup>22</sup>. The zero % of HBV may be due to the use of hepatitis B vaccine in the immunization schedules.

The prevalence of 0% of HIV infection among hemophiliac patients in this study is similar to that found in Turkey<sup>23</sup>, and India<sup>24</sup>, while in Iran was (1.1%)<sup>25</sup>.

The two hepatitis C positive patients were severe type hemophilia A, aged more than 15 years and received more than 40 times transfusion of blood and blood products. This agrees with the results found in Egypt<sup>22</sup>, Iran<sup>25</sup>, Brazil<sup>26</sup> and USA<sup>12</sup>. Patients with severe hemophilia and advanced age are at increased risk of acquiring blood-borne infection because they usually receive a large number of blood and blood products as a result of frequent bleeding.

The two cases with hepatitis C virus infection need PCR assay, if it is negative this means the infection was eradicated, but if the PCR is positive, genotyping is mandatory, as it helps to predict the likelihood of response to therapy and duration of therapy. Liver biopsy is necessary to detect fibrosis and progression to cirrhosis. Liver biopsy is usually, but not always, performed before initiating therapy<sup>27</sup>.

In this study, only 6 hemophiliac patients (15%) showed immunity to hepatitis B due to vaccination and the rest of patients were anti-HBS negative this may be

due to incomplete vaccination (missed one or two doses) or nonresponsive of patients to vaccination (Several factors have been associated with nonresponsiveness to hepatitis B vaccine. These include vaccine factors (e.g., dose, schedule, injection site), and host factors. Older age, male sex, obesity, smoking, and chronic illness).<sup>28</sup>

### Conclusion

1. This study showed that the prevalence of hepatitis B and HIV is zero, while hepatitis C is 5%.

2. Hepatitis C infection more in severe hemophilia A, advanced age and the increasing number of blood and blood products transfusion.

3. Only 6 patients (15%) among hemophiliac patients were seropositive for hepatitis B vaccine immunity.

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**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non.

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