

Original Article



# Prevalence of hepatitis B in HIV-positive patients in Zabol

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## Article info

Received: 17 Mar 2021

Revised: 22 May 2021

Accepted: 18 Jul 2021

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online



## Keywords:

Human  
Immunodeficiency  
Virus, HBV,  
Prevalence, Chronic  
Infection, Hepatitis C

## ABSTRACT

Today, due to the increase in life expectancy in HIV-infected patients, the incidence of related diseases such as hepatitis B and C due to similarity in transmission routes has become a major concern of the health community. Therefore, this study was performed to determine the prevalence of hepatitis B among HIV + patients in Zabol. This descriptive cross-sectional study was performed on 37 HIV-infected patients in Zabol city (2021-2022). In the present study, HIV-infected patients were screened for hepatitis B by measuring serum levels of HBC Ab and HBs Ag. Finally, the data in SPSS V21 software were analyzed. In the present study, a total of 37 HIV-infected patients with a mean age of 40.81- 11.64 years were evaluated. The present study's prevalence of HIV and HCV co-infection was 21.6%. Also, 13.5% of HIV patients had HBV and HCV simultaneously. Examination of risk factors for viral hepatitis in HIV-infected patients showed that unprotected sex (100%), injecting drug use or IDU (87.5%), dental procedures (75%), history of imprisonment (62.5%) and tattooing (50.5%) were the most common factors in HIV patients. Family history of hepatitis B (12.5%), alcohol (12.5%), transfusion (12.5%) and cupping (25%) were among the lowest cases in these patients. the frequency of HBV infection and co-infection with HCV and HBV in HIV-positive patients were relatively high. Except for the history of tattoos, there is no significant relationship between other risk factors and hepatitis B among HIV-positive patients.

## 1. Introduction

Hepatitis B and C viruses cause both acute and chronic infections. Two billion people have been infected with HBV; 400 million are chronically infected while 520,000 people die due to HBV-related conditions [1].

Acquired Immune Deficiency Syndrome (AIDS) is a range of abnormalities caused by impaired cellular and humeral immune responses due to HIV infection. In the spring of 1981, there were rumors in New York City's gay community about an exotic new disease

affecting gay men. The name of this new disease was AIDS. More than 70 million people have been infected with HIV [2]. Ninety percent of HIV infections are in developing countries and Eighty percent are sexual transmission from men who have sex with men (MSM). By the end of 2006, more than 25 million people had died of AIDS since 1981. And it is now estimated that 6% of people worldwide are currently living with HIV or AIDS, the AIDS, was one of the most devastating pandemics in human history [3, 4].

Although hepatitis virus- HIV co-infection

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has been extensively studied in developed countries [5]. It has not been well characterized in Asia and Africa where these viruses are highly endemic[6]. There is concern that hepatitis virus-related liver disease may threaten the success of ART programs in developing countries; therefore, understanding the prevalence and disease characteristics of HBV and HCV co-infection with HIV in Asia and Africa is essential [7].

Based on data from the Iran National HIV/AIDS Case Registry System, the total number of infected people with HIV was 20975 in 2009 (1560 women and 19415 men). Also, according to the same organization, the total number of infected people with HIV was 2307 in 2009 globally (222 women and 2085 men). According to statistics, the number of people who died from HIV in 2009 was approximately 3624. Based on the reported data, 92.6% of them were men and the other (7.4%) were women. The most common mode of transmission in Iran is shared use of needles (69.8%), unknown cases (19.5%), sexual contact (8.9%), infected blood (1.2%) and finally mother-to-child (0.6%) [8, 9].

According to the increasing number of HIV/AIDS cases in the whole world, particularly in developing countries, the prevention of opportunistic infections and malignancies in patients with HIV disease is important to optimize outcome[10]. Because the transmission routes of hepatitis B and HIV is common among HIV-positive patients due to their similar blood-borne transmission routes[11].

HBV infection has a poor effect on HIV-positive people[12]. The presence of HIV infection places patients at increased risk for the development of chronic HBV when acutely infected; approximately 20% of HIV-positive adults develop chronic HBV following horizontal exposure to the virus and develop chronic hepatitis B, while the probability of this event in normal individuals is equal to 5%. All patients with HIV should therefore be screened for the presence of co-infection with active or chronic HBV[13]. If you have a current infection or have recovered from a past infection. Hepatitis B Vaccine

recommendations. At any stage of HIV infection, HBV vaccination is highly recommended in people infected with HIV[14, 15].

The recent economic and social changes greatly increase the potential control for a substantial China's HIV epidemic. A substantial challenge for HIV and STI prevention efforts in China will be reaching the rapidly growing migrant population. Overall, they estimate China will have 700 000 people living with HIV by the end of 2007, including 85000 AIDS patients[16]. While varying in their transmission efficiency, HIV, hepatitis B (HBV), and hepatitis C (HCV) share the same modes of transmission, and as such, prevalence is generally higher in HIV-infected individuals. Studies [17, 18] show that HIV/HBV co-infection accelerates the progression.

Co-infected people have more risk of developing hepatotoxicity associated with the antiretroviral treatment (ART) than those who only have HIV. HIV/HBV co-infection accelerates the progression of chronic HBV to cirrhosis, end-stage liver disease, or hepatocellular carcinoma. The death risk of many liver diseases is inversely related to CD4+ cell count [19, 20].

HBV/HIV patients receiving antiretroviral therapy have an increased risk of hepatotoxicity and hepatocellular carcinoma. The mentioned cases show that the prevalence of HBV/ HIV co-infection in the whole world is high and a limited number of studies investigated the prevalence of hepatitis B / HIV co infection in our country and this study aimed to evaluate articles on the prevalence of HBV in people living with human immunodeficiency virus (HIV) /AIDS. The results of this study can provide important information about disease trends and risk factors, outcomes of treatment or public health interventions [21, 22].

## 2. Material and Methods

In this cross-sectional descriptive study, all HIV-positive patients in Zabol (n=37) were included in the study after interview and testing. Data such as age, sex, ethnicity, Blood transfusion history, the history of surgery and

hospitalization, the history of tattooing, dialysis history, cupping, history of imprisonment, unprotected sex, use of shared syringes and education level using an anonymous questionnaire were coded and collected by the researcher in coordination with the head of the Mental Injury Counseling Center; It should be noted that the implementation of this research was approved by the ethics committee of Zabol University. After collecting data, blood samples 10 cc were prepared to test HBS Ag, and HCV Ab as indicators of hepatitis B and C infections; the experiments were performed by ELISA assay.

The collected data were analyzed by SPSS software version 21 and T-Test and Chi-Square statistical tests were analyzed at a significance level of  $\alpha = 0.05$ . Mean quantification, the standard deviation to describe the quantitative data, and the percentage and frequency were used to describe the qualitative data, respectively, and were reported using tables and graphs.

### 3. Results

A total of 37 individuals (5 women and 32 men), participated in the study. The mean age of the patients was  $40.81 \pm 11.64$  years. Table 1 examines the risk factors for hepatitis C in HIV-infected patients. 5.4% of patients had a history of blood transfusion, 78.4% dentistry history, and 78.4% history of tattooing. The prevalence of hepatitis C in the subjects was 21.6% ( $n = 8$ ) of which 6 (18.75%) of patients with hepatitis C and 26 (81.25%) of patients without hepatitis C were male. Gender differences between the two groups were not statistically significant (0.292).

The prevalence of hepatitis C in Individuals with unprotected sex was 100%. In this study, it was found that all HIV-positive patients with hepatitis C had high-risk and unprotected sex. 79% of non-hepatitis C patients reported high-risk and unprotected sex. This difference was not statistically significant ( $P = 0.305$ ). Examination of tattooing in patients showed that 50% of HBS Ag+ patients and 86.2% of HBS Ag- patients had a history of tattooing. Tattooing was statistically significant between the two

groups ( $P = 0.028$ ). The result was unexpected.

There was no statistically significant relationship between the prevalence of hepatitis C and other variables studied (blood transfusion history, dialysis, surgery history, hospitalization, dentistry history, history of cupping, history of imprisonment, shared syringe use, alcohol consumption, family history of hepatitis B). The Evidence also showed that 5 patients (13.5%) were positive for hepatitis B and hepatitis C at the same time.

**Table 1.** Distribution of risk factors in HIV-positive patients

Risk factor	Frequency	%
History of blood transfusion	2	5.4
Dialysis	0	0
History of surgery	10	27
Hospitalization	26	70.3
dentistry history	29	78.4
Cupping	21	56.8
Tattooing	29	78.4
Imprisonment history	17	45.9
shared syringe use	34	91.9
Alcohol consumption	2	5.4
Family history of hepatitis C	1	2.7
unprotected sex	31	83.8

**Table 2.** Prevalence of hepatitis B in HIV-positive patients

Risk factor	Hepatitis		Total
	+	-	
Tattooing	(%13.8)4	(%86.2)25	(%100)29
History of blood transfusion	(%50)1	(%50)1	(%100)2
History of surgery	(%25.8)8	(%74.2)23	(%100)31
Cupping	(%40)4	(%60)6	(%100)10
dentistry history	(%9.52)2	(%90.47)19	(%100)21
shared syringe use	(%20.68)6	(%79.31)23	(%100)29
Alcohol consumption	(%20.58)7	(%76.41)27	(%100)34
Imprisonment history	(%50)1	(%50)1	(%100)2
Family history of hepatitis B.	(%100)1	(%0)0	(%100)1

#### 4. Discussion

According to the study, the prevalence of HBS Ag among HIV-positive patients was 21.6%, as the modes of transmission of HIV and hepatitis B are very similar; the prevalence of HBV is likely higher in this group. In studies performed in Iran and other parts of the world, similar results have been reported. Available data show that in most areas, approximately 10% of the HIV-seropositive individuals were co-infected with chronic HBV. In a Taeri and colleague, the prevalence of hepatitis B and C in HIV-positive patients in Isfahan determined, it was shown that out of 106 HIV+ individuals, 8.4% of people have hepatitis B virus, 4.9% B and C infections simultaneously [23, 24]. In the United States and Europe, HIV/HBV and HIV/HCV co-infection were reported in the range of 6 - 14% and 25 - 50% respectively [25]. This was in line with the present study.

In a Alavi and colleague study, the rate of HBV/HIV, HVC/HIV and HVC-HBV co-infection was 44%, 74% and 20%, respectively, which was higher than the present study [19]. It was related that the prevalence of HBs Ag and HCV Ab was 4.3% and 4.6%, respectively. In this study, only 0.2% had HCV/ HIV and HBV/HIV [26].

It was shown that prevalence and the associated factors of hepatitis B and hepatitis C viral infections among HIV-positive individuals in same-day antiretroviral therapy initiation program in Bangkok, Thailand the Around 5–10% of newly diagnosed PWH in Bangkok had hepatitis B viral infection after 25 years of uni- versal vaccination. Anti-HCV positivity was found in 4–5% of PWH who were MSM and TGW. As World Health Organization and Thailand national guidelines already support routine screening of hepatitis B and C viral infections in PWH and populations at increased risk of HIV including MSM and TGW, healthcare providers should reinforce this strategy [2].

These findings were higher than the present study, which can be due to differences in viral hepatitis risk factors, different cultures and sample size. In this study, there are statistically significant between HBV and

the male gender and aging. Therefore, targeted HIV/AIDS screening of men and the elderly population are very important [27]. In the present study, there is no association among viral hepatitis and age and sex variables. The study of Ejele OA demonstrates a high prevalence (9.7%) of HBsAg in HIV-infected patients.

This calls for more intensive prevention and surveillance measures to control the HIV/AIDS scourge and co-infection with HBV [27].

This study is the first, to our knowledge, to characterize HBV and HCV co-infection in treatment-naïve HIV-positive patients in China. Our data demonstrate that there is a high prevalence of HBV/HCV co-infection and also, there is a significant relationship between co-infections and important medical consequences. As ART scale-up increases through China's treatment program, liver disease from hepatitis virus co-infection and even from HIV mono-infection will be an emerging problem. Thus, the incorporation of screening and effective treatment of hepatitis virus infection into general HIV management in China is imperative [28].

Since 1993, Blood Donor Screening has been required to be for anti-HCV. The transmission of HCV occurs efficiently through blood or blood products such as red blood cells, platelet concentrates, fresh frozen plasma, and cryoprecipitate, as a result, blood transfusions are effectively controlled. However, in many infertile areas, the measure has not been fully implemented, which has caused many HIV-infected patients to also be infected with HCV [29]. HCV is not efficiently transmitted through sex, Occupational and perinatal exposures, while both HCV/HIV viruses can also be transmitted sexually. Although IDUs and former plasma/blood donors are the most common cause of infection, heterosexual sex has become the dominant transmission route in China [30, 31].

Several major modes of HIV/AIDS transmission have been identified in China. Plasma donors and IDUs are the most important ways of transmitting AIDS. An HIV-positive person who is simultaneously

injecting drugs or having risky sex (or high-risk sexual behavior) is not only exposed to a disease such as hepatitis B, but can also act as a carrier. Many individuals, especially injecting drug users, get the opportunity to a comprehensive and medical examination for the first time under an HIV screening test. Therefore, it is important to provide proper training to this group and to be aware of high-risk behaviors; It is also necessary to diagnose individuals with IV Drug use and high-risk sexual behavior because of proper and timely treatment can prevent the serious risk of the infection. Today, experts believe that the immediate cessation of risky behaviors in individuals with multiple cultural, economic and social problems does not seem very realistic and suggest that proper education of less dangerous and healthier behaviors prevents the spread of dangerous infectious diseases.

#### 4.1. Suggestions

Based on the increase of life expectancy in HIV-infected patients, the necessary recommendations in the field of risk factors, timely diagnosis and treatment of hepatitis C should be made. Therefore, it is necessary:

- HIV patients should be aware of all the risk factors for hepatitis.
- Necessary plans should be made to maximize the diagnostic tests for hepatitis C in these patients.
- Similar studies with higher sample sizes will be performed in the future while examining the more accurate relationship between risk factors and hepatitis C.

#### 5. Conclusion

Due to the prevalence of HIV+ and hepatitis B and the similarity of the transmission routes and diseases synergy simultaneously, timely diagnosis and treatment can prevent the progression of these diseases, and a practical solution to decreasing the risk of hepatitis B transmission in HIV+ patients and timely screening of these patients for hepatitis B, especially hepatitis B vaccination is very important.

#### Acknowledgments

This research was carried out with the financial support of the Vice Chancellor for Research of Zabol University of Medical Sciences, for which we are grateful.

#### Ethical Permissions

This project was carried out in compliance with all the principles of ethical regulations in the research approved by the Ministry of Health and after the approval of the ethics committee of Zabol University of Medical Sciences, with the financial support of Zabol University, Iran with the code IR.ZBMU.REC.1399.041

#### Authors' Contribution

L.R, KH. S, KH. R, E.A, A.D,A. K Contributed to conception and design. Contributed to all experimental work, data and statistical analysis, and interpretation of data. L.R.; Were responsible for overall supervision. All authors read and approved the final manuscript.

#### Conflicts of Interests

There is no conflict of interest to declare.

#### Consent for publications

All authors have read and approved the final manuscript for publication.

#### Availability of data and material

The authors have embedded all data in the manuscript.

#### Funding/Support

This research was carried out with the financial support of the Vice Chancellor for Research by Zabol University of Medical Sciences, for which we are grateful. We would also like to thank the Deputy Minister of Health for making the necessary arrangements for sample preparation and testing.

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#### How to Cite This Article:

Rezaie-Kahkhaie L, Saravani K, Rezaie-Keikhaie K, Azimi-Khatibani SE, Daman-Sooz AH, Afshari M, kamali A (2021) Prevalence of hepatitis B in HIV-positive patients in Zabol. *Cellular, Molecular and Biomedical Reports* 1 (3): 105-112. doi:10.55705/cmbr.2021.356667.1058

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