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Seroprevalence of Hepatitis B Virus and Hepatitis C Virus Infections Among People with Severe Mental Illness in Tehran, Iran

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Abstract

Background: High-risk behaviors in people with severe mental illnesses, such drug injection by shared equipment and unprotected sex, expose them to the risk of blood-borne infections such as hepatitis B virus (HBV) and hepatitis C virus (HCV) infections.
Objectives: This study aimed to determine the prevalence of HBV and HCV serum markers in people with severe mental illnesses in Tehran, Iran.
Methods: In this cross-sectional study, people with mental illnesses, such as schizophrenia, bipolar disorder, and depression, were studied. The participants were recruited using a non-random convenience sampling method from Roozbeh and Razi hospitals in Tehran between December 2019 and March 2020. Blood samples were evaluated for HCV-Ab, HBs Ag, HBs Ab, and HBc Ab using an enzyme immunoassay technique.
Results: A total of 257 participants were recruited for this study; their mean age was 35.77 years, and 70.0% of whom were male. Bipolar disorder (40.5%) and schizophrenia (35.8%) were the most frequent severe mental disorders in the participants. The prevalence of HBV and HCV seromarkers was as follows: HBs Ag: 0.3% (95% CI: 0.0 - 2.0%), HBc Ab: 7.3% (95% CI: 4.6 - 11.3%), HBs Ab: 18.7% (95% CI: 14.1 - 24.0%), and HCV Ab: 3.1% (95% CI: 1.3 - 6.9%). In logistic regression analysis, tattooing (OR = 4.94, 95% CI: 1.73 - 14.13) and age (OR= 1.06, 95% CI: 1.01 - 1.11) were associated with HBV infection (HBc Ab positivity), and only tattooing (OR= 6.33, 95% CI: 1.19 - 33.80) was significantly associated with exposure to HCV.
Conclusions: The results of this study showed that the prevalence of HBsAg positivity in people with severe mental illness was not higher than that in the general population of Iran; however, HCV Ab positivity was more prevalent in people with severe mental illness than in the general population of Iran. Preventive, diagnostic, and therapeutic interventions for HCV infection are needed in this population in Iran.

Keywords: Hepatitis B, Hepatitis C, Mental Disorders, Epidemiology

1. Background

Hepatitis B virus (HBV) and hepatitis C virus (HCV) are the leading causes of liver diseases worldwide (1). An estimated 292 (95% uncertainty interval of 252 - 341) million individuals were infected with chronic HBV, corresponding to a prevalence of 3.9% (3.4 - 4.6%) in 2016 (2). For HCV infection, the global figure is 71 million current infections (3). At the national level, the prevalence of age-standardized HBV infection in Iran was estimated to be 1.09% (95% uncertainty interval; 0.85 to 1.37) in 2016 (4). Moreover, the prevalence of chronic HCV infection in Iran is 0.24%, and its incidence is 11 per 100,000 population (5). It is noteworthy that only 35% of those with HCV infection are diagnosed, and only 4.2% of whom are treated (5). The main routes for the transmission of HBV include unprotected sexual contact, exposure to contaminated blood and body fluids, and mother-to-child transmission (6). The main HCV transmission route is unsafe injection, which currently accounts for more than half of all HCV transmissions in the United States (7).

It is estimated that 240 million people suffer from serious mental illnesses, with an almost equivalent distribution globally (8). According to the definition, serious mental illnesses (schizophrenia, schizoaffective disorder, bipolar disorder, or psychosis) are those character-

ized by constant and debilitating features and require specialized psychiatric treatment either in outpatient or inpatient setting. The prevalence of schizophrenia is 4.6 cases per 1000 people; however, 4.0% of people can experience schizophrenia during their life (8). People with serious mental illnesses are more vulnerable to sexually transmitted infections (STIs) than the general population (9). Studies have shown that patients with serious mental illnesses are constantly engaged in high-risk behaviors that make them susceptible to STIs, including HIV, HBV, HCV, and syphilis (9, 10). Studies have also shown that people with severe mental illnesses have significant health disparities. Sexual health needs, including screening and prevention of sexually transmitted infections and blood-borne viruses, are neglected in this population (11-13).

With currently available strategies for the prevention of HBV and HCV infections and the containment of their pandemics, the identification of target populations for screening for these viruses is necessary for policymakers. Epidemiological reports on the prevalence of HBV and HCV infections in Iranian individuals with severe mental illnesses are scarce.

2. Objectives

This study aimed to determine the prevalence of HBV and HCV seromarkers and to identify related risk factors in Iranian patients with schizophrenia, bipolar disorder, depression, and post-traumatic stress disorder (PTSD).

3. Methods

3.1. Study Design and Participants

This cross-sectional study was conducted in Roozbeh and Razi psychiatric hospitals in Tehran, Iran, between December 2019 and March 2020. In this study, people over 15 years of age with mental illnesses such as schizophrenia, bipolar disorder, and depression were enrolled using a non-random convenience sampling method. Those admitted to the hospitals mentioned were recruited and invited to participate. Verbal consent was obtained from those who accepted to participate and/or their guardians. The study protocol was reviewed and approved by the ethics committee of the Tehran University of Medical Sciences (IR.TUMS.SPH.REC.1398.161).

3.2. Assessment of HBV and HCV Seromarkers and Demographic and Behavioral Parameters

All participants underwent blood sampling via venipuncture, and blood samples were used for investigating HBV and HCV seromarkers. Enzyme immunoassay tests were used to detect HBsAg, HBcAb, HBsAb, and HCV-Ab in sera using the Baraton kit according to the manufacturer's instructions.

The research questionnaire included 51 questions, 35 of which addressed demographic characteristics and high-risk behaviors, and 16 questions were about participants' knowledge about the transmission, vaccination, and treatment of HBV and HCV infections. Of these 16 questions, 10 were related to HBV, and six were related to HCV. The content of the knowledge section of the questionnaire was validated by consulting with and sending the questions to five experts in the field and then receiving the scores and calculating the content validity rate (CVR) and content validity index (CVI). In this process, CVR was obtained as %100 and CVI as %90. The reliability of the questionnaire was calculated by conducting a pilot study consisting of 30 mentally ill patients and calculating Cronbach's alpha index based on the results. Cronbach's alpha coefficients were calculated to be 74% for the HBV section (10 questions) and 90% for the HCV section (six questions). For calculating the knowledge score, 2 points were considered for each correct answer, 1 point for each unanswered question, and 0 point for each false answer. Awareness of HBV and HCV features was scaled up to 60 to allow readers to compare their results.

3.3. Statistical Analysis

For statistical analysis, HBV and HCV biomarkers and answers to the questions were entered into the statistical analysis software SPSS Statistics for Windows, version 23 (IBM Corp., Armonk, N.Y., USA). Categorical variables were presented as numbers and percentages, and quantitative variables as mean $\pm$ standard deviation. A univariate logistic regression test was used to explain the relationship of high-risk behaviors with HBV and HCV exposure. Finally, variables with a P-value less than 0.2 in univariate logistic regression were entered into a multiple regression model using the forward selection method.

4. Results

4.1. Characteristics of Participants

During the study, 287 families were contacted, and 257 (89.5%) patients agreed to participate in the study. Of these

257 patients who were admitted to one of the two hospitals studied, 180 (70.0%) were men with an average age of 35.77 years. Among the participants, three (1.2%) were illiterate; 142 (55.3%) were single; 89 (34.6%) were unemployed; 244 (94.9%) lived in an urban area, and 223 (86.8%) lived with their families (Table 1). It should be noted that no hospitalized PTSD patients were recruited. Among mental disorders, bipolar disorder, with 104 (40.5%) participants, was the most frequent (Table 1). Most (40.9%) of the participants did not remember their HBV vaccination history, and 79 (30.7%) reported complete HBV vaccination. Only 21% of the participants had been previously tested for HBV and/or HCV (12.1% in hospitals and the rest in private medical centers and clinics). Among the participants in this study, 74 (28.8%) had tattoos, 36 (14%) of whom had the tattoo done by a friend. The mean hepatitis B awareness score was 40.32 out of 60, and the mean hepatitis C awareness score was 36.1 out of 60.

Table 1. Characteristics of the Participants

Variables	No. (%)
Gender	
Male	180 (70.0)
Female	77 (30.0)
Marital Status	
Single	142 (55.3)
Married	83 (32.3)
Divorced/widowed	32 (12.5)
Living place	
Urban	244 (94.9)
Rural	13 (5.1)
Current type of residence	
With family	223 (86.8)
Independent	34 (13.2)
Current employment status	
Unemployed	89 (34.6)
Employed	168 (65.4)
Education	
Illiterate	3 (1.2)
Primary and secondary school	211 (82.1)
Higher education	43 (16.7)
Type of mental disorder	
Schizophrenia	92 (35.8)
Bipolar disorder	104 (40.5)
Depression	36 (14.0)
Others [a]	25 (9.7)
Ethnicity	
Fars	112 (43.6)
Non-Fars	145 (56.4)
Hospital	
Rouzbeh	105 (40.9)
Razi	152 (59.1)
Age, mean ± SD	35.77 ± 10.45

Abbreviation: SD, standard deviation.
[a] Mental health illnesses other than schizophrenia, bipolar disorder, depression, and post-traumatic stress disorder

4.2. Prevalence of HBV and HCV Seromarkers in the Participants

The overall prevalence of HBsAg was 0.3% (one person), HBsAb 18.7% (48 people), HBcAb 7.3% (19 people), and HCV-Ab 3.1% (eight people). Based on the results, the only positive case for HBsAg suffered from schizophrenia. The highest prevalence of HBcAb (13.9%) and the highest prevalence of HCV-Ab (8.3%) were observed in people with depression. Table 2 describes the prevalence of HBsAg, HBcAb, HBsAb, and HCV-Ab in people with severe mental illnesses.

The distribution of HBcAb was not significantly different according to gender, living place, a positive history of surgical procedures, and using a condom during sexual contact. The prevalence of HBcAb showed variations by age, marital status, living place, employment status, educational level, history of drug use, history of having tattoos, and history of HBV vaccination (Table 3).

The prevalence of HCV-Ab was not significantly different by the residence status, but it was different according to gender, age, marital status, living place, employment status, educational level, history of drug use, history of having tattoos, using a condom during sexual contact, history of surgical procedure, and HBV vaccination. The prevalence of HCV-Ab by demographic characteristics and risk factors has been presented in Table 3.

4.3. Determinants of HBV and HCV Prevalence in People with Severe Mental Illness

In univariate analysis, higher age (OR: 1.05, P: 0.01), living independently (OR: 2.9, P: 0.03), Illiteracy/primary education (OR: 3.42, P: 0.02), absence of complete HBV vaccination (OR: 8.77, P: 0.03), and having a history of tattooing (OR: 4.86, P: 0.01) significantly increased the risk of HBcAb positivity. In multivariate analysis, higher age (OR: 1.06, P: 0.01) and having a history of tattooing (OR: 4.94, P: 0.03) remained independent modifiers of HBcAb positivity (Table 4).

In univariate analysis, having a history of tattooing (OR: 4.34, P: 0.04) significantly increased the risk of being positive for HCV-Ab. In multivariate analysis, having a history of tattooing (OR: 6.33, P: 0.03) remained an independent modifier of positivity for HCV-Ab. The results of univariate and multivariate analysis of the parameters modifying the risk of hepatitis C exposure (HCV-Ab) have been presented in Table 5.

Table 2. The Prevalence of HBV and HCV Seromarkers by the Type of Severe Mental Illness

Type of Disease (No.)	HBsAg		HBsAb		HBcAb		HCV-Ab	
	No.	95% CI of %	No.	95% CI of %	No.	95% CI of %	No.	95% CI of %
Total (257)	1	0.3 (0.0 - 2.0)	48	18.7 (14.1 - 24.0)	19	7.3 (4.6 - 11.3)	8	3.1 (1.3 - 6.9)
Schizophrenia (92)	1	1.1 (0.0 - 5.9)	16	17.6 (10.28 - 26.7)	6	6.6 (2.4 - 13.7)	2	2.2 (0.2 - 7.4)
Bipolar disorder (104)	0	0 (0.0 - 3.5)	21	20.1 (12.9 - 29.2)	6	5.7 (2.1 - 12.1)	2	1.9 (0.2 - 6.8)
Depression (36)	0	0 (0.0 - 9.7)	5	13.9 (4.6 - 29.5)	5	13.9 (4.6 - 29.5)	3	8.3 (1.7 - 22.5)
Others [a] (25)	0	0 (0.0 - 13.7)	6	24.0 (9.4.5 - 45.1)	2	8.0 (0.9 - 26.0)	1	4.0 (0.1 - 20.3)

Abbreviations: CI, confidence interval; No, number.
[a] Mental health illnesses other than schizophrenia, bipolar disorder, depression, and post-traumatic stress disorder.

5. Discussion

Studies have shown that people with serious mental illnesses engage with behaviors that predispose them to sexually transmitted and blood-borne infections, including HIV, hepatitis B and C, and syphilis (9, 10). Although there are many studies in different countries on this issue and the importance of paying attention to this group regarding blood-borne infections, the prevalence of HBV and HCV in this group has not been studied in Iran. Our results showed that the prevalence of HCV in people with serious mental illnesses was significantly higher than the prevalence reported in the general population of Iran.

In the serological examination, the prevalence of HCV-Ab, HBsAg, HBsAb, and HBcAb was 3.1%, 0.3%, 18.7%, and 7.3%, respectively. In a similar study in Sweden, the prevalence of HBV in people with serious mental illnesses was 0.53%, compared to 0.22% in the general population, and the prevalence of HCV was 4.58%, in comparison with 0.61% in the general population (14). The results of the current study showed that the prevalence of HBsAg in people with serious mental illnesses (0.3%) was lower than in the general population (1.09%) (4). The reason for the low percentage of hepatitis B in this group can be vaccination. This study also showed that the prevalence of hepatitis B in this group was much lower than the prevalence of hepatitis B in people with serious mental illnesses in Asia (9.7%) (7). In a study, Kramvis et al. examined the serological prevalence of hepatitis B and C in people with serious mental illnesses in Nigeria and reported that the frequencies of hepatitis B and C in people with serious mental illnesses were 10.0% and 12.6%, respectively, in comparison with 10.9% and 1.1% in blood donors, respectively. Thus, there was a significant difference in the prevalence of HCV in the studied population compared to blood donors (15). Furthermore, this study showed that the prevalence of HCV-Ab was higher in people with serious mental illnesses than in the general population of Iran (16). Accordingly, it should be noted that people with serious mental illnesses are among the groups with a high prevalence of hepatitis C in Iran. Due to the increasing trend of mental disorders in Iran, special attention should be paid to the screening of this group for HCV infection. Moreover, the results of the present study, compared to the findings of other studies conducted in other countries in this particular group, showed that HCV was less prevalent in Iran than in Asia (4.4%) (17).

The simultaneous detection of HBsAb and HBcAb is indicative of hepatitis B exposure, while the detection of HBsAb alone is indicative of vaccination. According to the findings of this study, 11.4% of the participants were only positive for HBsAb, meaning that they were already vaccinated and immune against HBV. However, there is a possibility for the clearance of vaccine-induced antibodies in long-term after receiving the vaccine, but vaccinated people who have even cleared the antibodies are immune against HBV transmission. In a similar study, Mohamadnezhad et al. investigated hepatitis B markers in thalassemia and dialysis patients and showed that among 94 samples, 12.8% were HBsAg positive, 57.4% were HBsAb positive, and 13.8% were HBcAb positive, while 42.6% of the study population were not immune against HBV (18).

Similar epidemiological studies on high-risk behaviors in this population reported risk factors such as injecting drugs and unprotected sexual behaviors (7). In a study by Bauer-Staeb et al., age (OR: 1.003) and the history of using drugs (OR: 4.11) were significantly associated with hepatitis B and C infections (14). In the current study, in addition to

Table 3. Distribution of Exposure to HBV (HBcAb) and HCV Infections (HCV-Ab) by Participants' Characteristics

Variables	No.	HBcAb		HCV-Ab	
		No.	95% CI of %	No.	95% CI of %
Gender					
Male	180	13	7.2 (3.9 - 12.1)	7	3.9 (1.5 - 7.8)
Female	77	6	7.6 (2.8 - 16.2)	1	1.3 (0.0 - 7.0)
Age					
15 - 30	80	1	1.3 (0.0 - 6.7)	0	0 (0.0 - 4.5)
31 - 45	130	11	8.5 (4.3 - 14.6)	6	4.6 (1.7 - 9.8)
> 45	47	7	14.9 (6.2 - 28.3)	2	4.3 (0.5 - 14.5)
Ethnicity					
Fars	112	7	6.2 (1.7 - 10.7)	2	1.7 (0.1 - 4.2)
Non-Fars	145	12	8.2 (3.7 - 12.7)	6	4.1 (1.0 - 7.3)
Marital status					
Single	142	7	4.9 (2.1 - 9.8)	2	1.4 (0.1 - 5.0)
Married	83	10	12.0 (5.9 - 21.0)	6	7.2 (2.7 - 15.1)
Divorced/widowed	32	2	6.2 (0.7 - 20.8)	0	0 (0.0 - 10.8)
Living place					
Urban	244	18	7.4 (4.5 - 11.4)	8	3.3 (1.4 - 6.3)
Rural	13	1	7.7 (0.1 - 36.0)	0	0 (0.0 - 24.7)
Current type of residence					
With family	223	14	6.2 (3.4 - 10.3)	7	3.1 (1.2 - 6.3)
Independent	33	5	15.1 (5.1 - 31.9)	1	3.0 (0.1 - 15.7)
Current employment status					
Unemployed	89	4	4.4(1.2 - 11.1)	0	0 (0.0 - 4.1)
Employed	168	15	8.9 (5.0 - 14.3)	8	4.7 (2.0 - 9.1)
Education					
Illiterate	3	1	33.3 (0.8 - 90.5)	0	0 (0.0 - 70.7)
Primary and secondary school	211	16	7.5 (4.5 - 12.1)	7	3.3 (1.3 - 6.8)
Higher education	43	2	4.6 (0.6 - 15.8)	1	2.3 (0.06 - 12.3)
History of drug use					
Yes	110	12	10.9 (5.7 - 18.2)	5	4.5 (1.5 - 10.3)
No	146	7	4.8 (1.9 - 9.7)	3	2.1 (0.4 - 5.9)
Alcohol consumption					
Yes	114	11	9.6 (4.9 - 16.6)	3	2.6 (0.1 - 5.5)
No	143	8	5.6 (2.4 - 10.7)	5	3.5 (1.1 - 7.9)
History of having tattoos					
Yes	74	12	16.2 (8.6 - 26.6)	5	6.8 (2.2 - 15.1)
No	183	7	3.8 (1.5 - 7.7)	3	1.6 (0.3 - 4.7)
Using condoms during sexual contacts					
Yes	41	3	7.3 (1.5 - 19.9)	1	2.4 (0.0 - 12.8)
No	119	11	9.2 (4.7 - 15.9)	6	5.0 (1.8 - 10.6)
History of surgical procedures					
Yes	117	10	8.5 (4.1 - 15.1)	2	1.7 (0.2 - 6.0)
No	140	9	6.4(2.9 - 11.8)	6	4.3 (1.5 - 9.0)
HBV vaccination history					
Complete	79	1	1.3 (0.0 - 6.8)	1	1.3 (0.0 - 6.8)
Incomplete	13	3	23.1 (5.0 - 53.8)	1	7.6 (0.2 - 36.0)
Not vaccinated	60	10	16.7 (8.2 - 28.5)	3	5.0 (1.0 - 13.9)
Not remembering	105	5	4.8 (1.6 - 10.7)	3	2.9 (0.6 - 8.1)

Abbreviation: CI, confidence interval.

Table 4. Association of Demographic and Behavioral Parameters with HBV Exposure (HBcAb Positivity)

Variables	Univariate Analysis [a]			Multivariate Analysis [a]		
	P-Value	OR	95% CI of OR	P-Value	OR	95% CI of OR
Age	0.01	1.05	1.01 - 1.10	0.01	1.06	1.01 - 1.11
Gender						
Male		1				
Female	0.87	1.08	0.34 - 2.9	-	-	-
Marital status						
Single		1				
Married	0.12	2.07	0.81 - 5.3	NS	-	-
Ethnicity						
Fars		1				
Non-Fars	0.53	1.35	0.51 - 3.55	-	-	-
Living place						
Urban		1				
Rural	0.96	1.04	0.12 - 8.5	-	-	-
Current type of residence						
With family		1				
Independent	0.03	2.9	1.05 - 8.01	NS	-	-
Current employment status						
Unemployed		1				
Employed	0.20	2.08	0.67 - 6.47	NS	-	-
Education						
Secondary/higher education		1				
Illiteracy/primary education	0.02	3.42	1.2 - 9.82	NS	-	-
Type of disease						
Schizophrenia		1				
Bipolar disorder	0.82	0.87	0.28 - 2.82	NS	-	-
Depression	0.19	2.31	0.65 - 8.11	NS	-	-
Other	0.79	1.24	0.23 - 6.58	NS	-	-
Awareness						
Average		1				
Good	0.35	1.59	0.59 - 4.34	-	-	-
HBV vaccination						
Complete		1				
No/incomplete	0.03	8.77	1.15 - 66.93	NS	-	-
History of alcohol consumption						
No		1				
Yes	0.14	2.06	0.78 - 5.49	NS	-	-
History of drug use						
No		1				
Yes	0.07	2.43	0.94 - 6.4	NS	-	-
History of tattooing						
No		1			1	
Yes	0.01	4.86	1.85 - 12.91	0.03	4.94	1.73 - 14.13
History of surgery						
No		1				
Yes	0.51	1.36	0.53 - 3.47	-	-	-
Using a condom during sexual contact						
Yes		1				
No	0.53	1.52	0.41 - 5.7	-	-	-

Abbreviations: CI, confidence interval; OR, odds ratio; NS, not significant.
[a] The results from the logistic regression analysis.

Table 5. Association of Demographic and Behavioral Parameters with HCV Exposure (HCV-Ab Positivity)

Variables	Univariate Analysis [a]			Multivariate Analysis [a]		
	P-Value	OR	95%CI of OR	P-Value	OR	95%CI of OR
Age	0.1	1.05	0.98 - 1.12	NS	-	-
Gender						
Female		1				
Male	0.29	3.07	0.38 - 25.43	-	-	-
Marital status						
Single		1				
Married	0.07	3.7	0.88 - 16.28	NS	-	-
Ethnicity						
Fars		1				
Non-Fars	0.29	2.37	0.47 - 11.9	-	-	-
Current type of residence						
With family		1				
Independent	0.08	4.22	0.83 - 21.34	NS	-	-
Education						
Secondary/higher education		1				
Illiteracy/primary education	0.13	3.49	0.6 - 17.65	NS	-	-
Type of disease						
Schizophrenia		1				
Bipolar	0.9	0.88	0.12 - 6.31	NS	-	-
Depression	0.13	4.09	0.65 - 25.58	NS	-	-
Other	0.61	1.87	0.16 - 21.56	NS	-	-
Awareness						
Average		1				
Good	0.24	2.32	0.56 - 9.52	-	-	-
HBV Vaccination						
Complete		1				
No/incomplete	0.28	3.1	0.38 - 26.93	-	-	-
Alcohol consumption						
Yes		1				
No	0.92	1.07	0.23 - 4.89	-	-	-
History of drug use						
No		1				
Yes	0.27	2.27	0.53 - 9.7	-	-	-
History of tattooing						
No		1				
Yes	0.04	4.34	1.01 - 18.68	0.03	6.33	1.19 - 33.80
History of surgery						
Yes		1				
No	0.25	2.57	0.51 - 13.0	-	-	-
Using a condom during sexual contact						
Yes		1				
No	0.4	2.49	0.29 - 21.29	-	-	-

Abbreviations: CI, confidence interval; OR, odds ratio; NS, not significant.
[a] The results from the logistic regression analysis.

determining the prevalence of viral hepatitis in this group, we also examined their related risk factors, identifying that age (OR: 1.06) and tattooing (OR: 4.94) were significantly associated with hepatitis B infection (HbcAb), as revealed in a multiple regression model. Our results showed that the percentage of exposure increased with age, which could be related to vaccination in people under 30 years of age.

Besides, in the multiple regression model, hepatitis C had a significant relationship only with the history of having tattoos (OR: 6.33). Although the chance of exposure to HCV was 3.7 times higher in married people than in single people and 4.22 times more in people living in-

dependently than in people living with the family, these differences did not reach a statistically significant level. However, more multi-centric studies are needed, including other provinces and larger sample sizes, to better understand high-risk behaviors and estimate the prevalence of HBV and HCV infections in this population.

One of the limitations of this study was the lack of cooperation of a number of medical centers in conducting this research, which of course, the coronavirus disease 2019 pandemic played a key role in this regard. The response of study participants to questionnaires was also subjected to their mental and physical conditions, and it seems that these patients are more inclined to conceal their behaviors, making it difficult to analyze their high-risk behaviors. Finally, the results of this study were obtained from two hospitals in Tehran and cannot be extrapolated to the general population of individuals with mental illnesses in Iran because the sample population from these hospitals located in Tehran showed a higher level of urbanization than in other provinces of Iran. This is important as the prevalence of mental disorders varies between rural and urban communities.

5.1. Conclusions

The results of this study showed that the prevalence of HBV infection was not significantly different between people with serious mental illnesses and the general population of Iran, but HCV infection had a higher prevalence in individuals with serious mental illnesses than in the general population of Iran. Not paying attention to this special population and the presence of these unidentified infected people in the society can increase the risk of virus transmission and exposure of other people to the infection. Furthermore, the high susceptibility rate to HBV and the low percentage of vaccination coverage in this group can have important messages for policymakers and decision-makers. There is a need to complete the vaccination of patients with mental illnesses, pay more attention to their education and screening, identify people with blood-borne infectious diseases, and specify centers for the referral and treatment of these patients.

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Footnotes

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