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Original Research Article

Assessment of hepatitis B in high risk people of Gachsaran city, Iran

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ABSTRACT

Background: Hepatitis B virus (HBV) is a major health problem throughout the world. The aim of this study determines the rate of prevalence of molecular and Seroepidemiological hepatitis B infections high risk populations in the Gachsaran city, according to factors such as age, sex, employment status, educational status etc.
Methods: In a descriptive and analytical study, blood samples have been collected from 500 high risks individuals, from February 2015 to July 2016 in Gachsaran. The serum samples were tested by ELISA and PCR method was used to confirm the diagnosis. Data were analyzed by SPSS statistical program.
Results: HBsAg was detected in 5 out of the 500 individuals, giving an overall prevalence of 1%. All the positive samples were in males. The rate of infection among the individuals with a history of unprotected sexual contact was 8% and was 0% among the individuals who experienced a needle stick. Four out of the five infected persons with hepatitis didn't receive any vaccination and one of them received only one dose of vaccine.
Conclusions: The results showed 1% infection at high-risk groups in the Gachsaran city. Age rising, maleness, unemployment, low educational level and suspicies sexual partners have been the factors of increasing HBV infection prevalence. Full vaccination has a strong and meaningful relationship with hepatitis B in the target groups, which requires all people at risk to be vaccinated completely. Government cooperation to identify and treat injecting drug users and encourage them to follow the preventive methods is beneficial.

Keywords: Hepatitis B, High risk group, Molecular, Seroprevalance

INTRODUCTION

Hepatitis B is a major health problem throughout the world. Hepatitis B virus (HBV) a member of *hepadnaviridae* family is the causative agent of hepatitis B infection. This infection is one of the major global health problems. Of the approximately 2 billion people, who have been infected worldwide more than 350 million are chronic carriers of HBV.[1] HBV infection accounts for 5,00,000 to 1.2 million deaths each year.[2] In Iran, epidemiology of HBV infection has changed dramatically during the last two decades. Seroprevalence of HBsAg has changed from 2.5-7% in 1980s to 1.07-5% in 1990s and to 1-2% in 2000s.[3-5] Extensive people's knowledge about HBV risk factors, national vaccination program since 1993 for all neonates, vaccination of high risk groups such as healthcare workers and the introduction of disposable syringes for use in vaccinations, hospitals and clinics might justify this decrease.[6] Transmissions may occur through sexual intercourse, parenteral contact or from an infected mother to the baby at birth.[3] HBV also shares similar characteristics to the HIV transmission, the virus has been detected in peripheral mononuclear cells, tissue of pancreas, kidney, skin, and spleen and of fluids

like semen, breast milk, sweat, tears, urine and vaginal secretion.[3,4]

The prevalence of hepatitis B infection varies in different parts of the world, ranging from less than 1% to 15%. In the Middle East, the endemicity is intermittent, with a carrier rate of 2% to 8 %.[5-8]

A systematic review on HBV infection in Iran revealed that prevalence of this infection is approximately 2.14% (range, 1.3% to 6.3%) across provinces.[9] The prevalence of HBV infection is higher among males than females in Iran.[9] Knowledge about the rate of hepatitis B infection and its related risk factors are necessary for implementing any preventive program. The aim of this study determines the rate of prevalence of molecular and Seroepidemiological hepatitis B infections high risk populations in the Gachsaran city, according to factors such as age, sex, employment status, educational status and etc. Because Gachsaran has the traditional industries, especially oil and gas industry. Gachsaran is Immigration city with different cultures. To allow a comparison with other regions of the country and reports of other countries done as well as measures to prevent the spread and incidence of hepatitis B done.

METHODS

This descriptive cross-sectional study was carried out in Gachsaran in Kohgiloyeh and Boyerahmad province, in southwest of Iran. A structured questionnaire containing demographics data such as age, gender, education level was used to collect the data. High risk populations for HBV infection including those who had a history of blood transfusion, history of intravenous drug use, history of incarceration, those with unsafe sexual activities, health care workers, patients on maintenance haemodialysis and hemophilic patients from Gachsaran city were the subjects of this study.

After getting approval from the ethics committee of Yasouj University of Medical Sciences, 5 ml of blood samples were obtained from each of 500 participants including, 256 in male (51.2) and 244 (48.8) in female, 370 No high-risk behavior, health care workers (based on the population of health care workers in the province), 59 Thalassemia / Hemophilia / blood transfusion,25 needle stick (needles), 25 unprotected sex and 21 injection drug users (those can be reached). All sera were tested for HBsAg by enzyme-linked immunosorbent assay (ELISA, Dialab, Austria).

All positive samples were tested twice for the confirmation of the results. ELISA positive samples were separated and then the DNA positive specimens for confirmatory testing is extracted PCR. For extracting DNA from serum or plasma samples, the kit Cinna Pure Viral (Cinnagen company, Iran) catalog number (Cat. NO. PR921733) PR921733 was used. For PCR reaction of Hepatitis B Virus PCR Detection kit (Cinnagen company, Iran) the catalog number PR7821C (Cat. NO. PR7821C) was used. Data were collected and using ordinal logistic regression method to calculate the odds ratio data were statistically analyzed by SPSS and P value <0.05 was considered statistically significant. In this study, due to sample size calculation formula for epidemiological studies for qualitative variable and consider to Base on previous studies from Khosravani and colleagues sample size was estimated 500.

RESULTS

Five hundred high risk people for HBV from gachsaran city from Kohgiloyeh & Boyerahmad providence were included in this study. Among 500 individuals there were 256 males (51.2%) and 244 females (48.8%). Regarding the age of participants, were between 2 to 85 years, HBsAg was detected in 5 out of the 500 individuals showed in Table 1.

Table 1: Test results of high risk groups associated with HBV infection study in Gachsaran city according to ELISA and PCR.

Test results	Number	Percent	No missing data percent	Cumulative percent
Negative	495	99	99	99
Positive	5	1	1	100
Total	100	100	500	

Table 2: Frequently distribution of high risk groups associated with HBV infection study in Gachsaran city according to history of addictive injection.

Addiction history	Number	Percent	No missing data percent	Cumulative percent
Without a history of injection	420	80.8	80.8	80.8
Injection drug abuser	21	6.8	6.8	87.6
Injection etc.	59	12.4	12.4	100
total	500	100	100	500

Table 3: Frequently distribution of high risk groups associated with HBV infection study in Gachsaran city according to dangerous behaviour.

Dangerous behavior	Number	Present	No missing data percent	Cumulative percent
No high-risk behavior	370	74.2	74.2	74.2
Thalassemia / Hemophilia / blood transfusion	59	11.8	11.8	86
Needle stick (needles)	25	5	5	91
Unprotected sex	25	5	5	96
Injection drug abuser	21	4.2	4.2	100

In this study hepatitis B in high risk people in Gachsaran city the number of participants were, 420 (80.8%) without a history of injection no history of drug use, 21 (6.8). Injection drug abuser and 59 (12.4%) no drug Injection. Most participants in this study had been without a history of injection drug that showed in Table 2.

Table 4: Risk factors associated with HBV infection in high risk groups.

Risk factor	HBV positive	HBV negative	Total	P value
History of imprisonment	13 (2.1%)	603	616	<0.05
History of using injecting drug	5 (3.16%)	153	158	<0.05
Transfusion	0 (0%)	22	22	>0.05
Needle stick	0 (0%)	222	222	>0.05
Thalassemia	0 (0%)	49	49	>0.05
Hemophilia	0 (0%)	3	3	>0.05
Unprotected sex activities	0 (0%)	16	16	>0.05
Others†	11 (1.19%)	912	923	>0.05

Table 5: The distribution agreement of hepatitis B positive cases high risk groups associated with HBV infection study in Gachsaran city according to vaccination period.

Total	Results		Hepatitis B vaccination	
	Positive	Negative		
418	0	418	Number	3 Does
100	0	100%	% Ratio Hepatitis B vaccination in group	
9	1	8	Number	1 does
100	11.1	88.9	% Ratio Hepatitis B vaccination in group	
54	0	54	Number	2 does
100	0	100%	% Ratio Hepatitis B vaccination in group	
19	4	15	Number	No vaccination
100	21.1	78.9	% Ratio Hepatitis B vaccination in group	
500	5	495	Number	Total
100	1%	99%	% Ratio Hepatitis B vaccination in group	

Table 6: Multiple logistic regression analysis.

Confidence 95%		P value	Statistical test	Odds ratio	Class Reference	Variable
+inf	0.0065	1	5	0.25	Unemployed	Job
0.194	0.0021	0.22	2	0	Married	Married
19.5	0	0.66	4	0.5	Higher Diplpma	education
_inf	0.22	0.38	5	3.24	Don't have	dangerous behavior
157.07	0.08	11	3	2.22	Don't have	Prison record
+inf	0.5	0	5	3.67	Don't have	Vaccination record
0	97.68	Model score	(*) Median unbiased estimates (MUE)			

All the positive tests belonged to male and considering, single, married and divorced were (3, 2 and 0) that equal to 1.3%, 0.8% and 0% respectively. The sex of participants, males were more susceptible to HBV infection. According to educational rate that divided to without any education, primary school, primary high school, secondary high school, bachelor and master, positive teste was 0,0,2,2,0,1,0,0 among them respectively. Ratio chance and significant level of assessment in high risk patients identified Behavioral Risk, education, marital, occupation and prisoner increased HBV infection. But this is not as vaccination. Someone who is high-risk behavior and a history of imprisonment, three and two against the rest at risk. In vaccination with P value less than 0.05, it was determined that someone no vaccination history hundreds of times relative to others is disease risk the vaccination has strong relationship significant with target groups.

DISCUSSION

Hepatitis-B is found throughout the world, it has no seasonal distribution. The reported prevalence of carrier in different population varies widely from 0.1% in the advanced countries to 20% in the developing nations. Prevalence of hepatitis B varies from country to country and depends upon a complex interplay of behavioural, environmental and host factors.[10] In Iran the prevalence of hepatitis B varies between 1.3 to 6.3% in different areas of the country.[11] Because of lack of information about HBV infection in southwest of Iran the present study was conducted to look at the seroprevalence of HBV in high risk groups in this area. A prevalence of 1% was found for HBV infection among the participant in this study. Comparing the findings of this study with other reports from the country, lower prevalence of HBV can be seen in this area.[11,12] Findings of this study demonstrated a relatively low prevalence of HBV in the region. Since the recruited subjects of this study are the selected high risk groups, therefore the rate of HBV in whole population of the district might be different. This low rate of HBV infection in the gachsaran city might be connected to HBV vaccination coverage in this area. National levels of HBV1, HBV2 and HBV3 vaccination coverage in Iran have been reported to be 98.9%, 98.8% and 98.4% respectively. Vaccination coverage of HBV in gachsaran city is up to 99.5%.[13]

In a recent study the overall prevalence of HBsAg positivity among general population in northeast of Iran was found to be 1.39% which is higher than the rate of infection in present study.[14] An unexpected observation in this study was that all positive HBV infections were males. There was no obvious explanation for the difference in gender, as a risk factor, for these viral infections. Having no infection in females might be due to the high-risk groups which were evaluated in this study. Positive cases are all among those with a history of imprisonment or history of using injection drugs. More than 95% of these two groups were males. Furthermore, most of female's participants in this study were either health care workers (with a well coverage of HBV vaccination), or those with history of tattooing, history of surgery, etc. and these factors are not as important as history of imprisonment or history of using injecting drug. In contrary to our findings, some studies demonstrated a lower prevalence of HBV infection in males than females.[15] Intravenous drug users are at higher risk for HBV infection, primarily through high risk sexual activities and sharing unsterile needles. The prevalence of HBsAg among male injecting drug users (IDUs) in Tehran, Iran, was reported to be 5.8% while in Zahedan, Southeast of Iran, rate of HBV in hospitalized injection drug users was found to be 19.3%.[15] In another study, the prevalence of HBV infection among hospitalized intravenous drug users in Ahvaz, southwest Iran, was 3.6% .[16]

In present study the prevalence of HBV infection among injection drug users was 3.2% which is slightly lower than those reported from Tehran or other parts of the country.[17] Rate of HBV infection in prisoners in our study was 2.1% and a positive correlation was found between being in prison and seropositivity to HBV. This is again much lower than the rate of infection in incarcerations in other parts of the country. A study in south of Iran, in Bushehr province, reported a rate of 16.7% of HBV infection in prisoners.[18]

In present study, none of the hemophilic or thalassemic patients were positive for HBV infection. Repeated blood transfusions, as in thalassemia cases, are among the highest risk factors for HBV infection. In an interesting study in Bangladesh, the prevalence of transfusion-mediated viral infections in multi-transfused thalassemic individuals has been evaluated prior to initiate blood transfusion and after the subjects have received an average of 17 blood transfusions over a ten-month study period. The HBV have been significantly higher in post-transfused subjects as compared to pre-transfusion levels.[19] Correlation between thalassemia and hemophilia and HBV infection were insignificant in our study and this might be due to the limited number of cases in our study. The proper screening of donated blood in blood banks, regarding HBV infection, and high coverage of vaccination of people who are afflicted by hemophilia, thalassemia might be contributed to the low rate of infection in these high-risk groups. Iranian blood transfusion organization (IBTO) is the only nationally qualified organization in Iran that performs blood transfusion procedures. This government-based organization provides its services free of charge. According to the most recent estimations, there are 23 blood donors per 1000 population. Only in 2005, the IBTO produced 1,600,000 units of blood for transfusion purposes. Approximately 96% of blood donations in Iran are collected from voluntary non-remunerated blood donors and the rest (4%) is donated as family replacement donation.[20] Khedmat et al, reported a rate of 0.487% for HBs antigen in Iranian blood donors.[21] The finding of this

study showed that the people with a history of vaccination were infected by hepatitis B with a rate of 0% and there was a significant correlation between increasing number of vaccine doses and decreasing the rate of HBV infection.

CONCLUSION

In conclusion, it is essential to assess the magnitude of the problem of HBV infection in each region of the country. Findings of the present study provided epidemiological features of hepatitis B and its risk factors in Gachsaran city on Kohgiloyeh and Boyerahmad province in Southwest of Iran. This information may help to restrain the spread of HBV infection in this and other similar settings in the country. The findings may also help the health authorities for better implementation of any prevention and control program. The overall prevalence of HBV infection in this population was 1%. Considering the sex of participants, males were more susceptible to HBV infection. The prevalence of HBV infection showed 1% that all of them was among injection drug users. while none of hemophilia and thalassemia patients were found to be positive. Significant associations were identified between HBV infection and sex, history of imprisonment, drug abuse, and place of residence ($p<0.05$). No statistically significant association was observed between HBV infection and history of needle stick (in health care workers) ($p>0.05$).

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