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Original Research Article

The percentage of hepatitis B virus infection and related factors in Tra Vinh province, Vietnam

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ABSTRACT

Background: Hepatitis B virus infection continues to be a public health problem in developing countries. This study aimed to assess the percentage of hepatitis B virus infection and related factors among adult population in Tra Vinh Province, Vietnam 2022.
Methods: The study applied the cross-sectional descriptive design with the combination of structured interview and serological blood tests, from September 1, 2021, to June 1, 2022.
Results: There were 1,289 respondents in the study. Overall, the percentage of sample positive reaction with HBsAg were 7.68% (99 peoples). Most of the people did not likely have relatives with a family history of hepatitis B virus infection, the proportion of people who had household family members who had hepatitis B, hepatocellular carcinoma, and cirrhosis was 1.24%, 0.93%, and 2.48% respectively. People who did not preventive vaccination for hepatitis B virus had higher rates of HBsAg (+) than people get preventive vaccination, with p=0.005. However, in other medical practice, the rate of HBsAg was non-significance, such as blood transfusion, surgery, dental treatment, injecting medications, and injected skin boils. The percentage of hepatitis B virus infection in the study was not significantly associated with hepatitis B prevention practices in daily life, including acupuncture, sharing shavers, sharing toothbrushes, sharing nail tools, and spraying tattoo.
Conclusions: The percentage of hepatitis B virus infection in Tra Vinh province was 7.68%. There was a statistically significant relationship between the incidence of hepatitis B with preventive vaccination for the hepatitis B virus.

Keywords: HBV, Prevention, Tra Vinh, Vaccination, Vietnam

INTRODUCTION

Hepatitis B is a chronic infectious disease that doesn't have a thorough treatment. However, hepatitis B infection is preventable through public health policies that manage well and take measures to prevent its spread.[1] Now, chronic hepatitis B has dramatically changed global patterns of disease burden, and it will continue potentially life-threatening illnesses to human health in the future.[1] Vietnam has a high rate of hepatitis B infection in the world. According to statistics from the Ministry of health on chronic hepatitis B infection in Vietnam in 2015, there were about 8.4 million people exposed to chronic hepatitis B virus leading to 23,300 cases.[2] Hepatitis B is a common cause of liver disease and is also one of the leading causes of death with cirrhosis and liver cancer.[2] Tra Vinh is a province in the Southwest of Vietnam, with a relatively large natural area and has not had much research on hepatitis B virus infections.[3] Therefore, an assessment of knowledge and behavior on the prevention of chronic hepatic B infection is necessary, and it is basically to have supplement data for better disease prevention.

METHODS

Study design

This was a cross-sectionals study done at communities, Tra Vinh province, Vietnam from December 2021 to June 2022.

Study participants

Southern Khmer people aged 18-60 living in Tra Vinh province were included in the study.

Inclusion criteria of the study participants

People aged 18-60 living in Tra Vinh province, willing to return for required follow-up visits.

Exclusion criteria of the study participants

Ethical considerations, such as being unable to give informed consent. The patient refuses to give informed consent.

Sample size

Sample size was calculated using the formula

$$n = Z^2_{(1-\frac{\alpha}{2})} \frac{p\,(1-p)}{d^2}\ DE$$

p: The percentage of hepatitis B virus infection (HBsAg (+)) based on the research in Quang Binh, Vietnam, with p=11.9%;

d = 0.05, the selected errors

DE: effect size: 2;

n: sample necessary for research, we had n at least: 1,289 sample

People who meet the inclusion criteria were then eligible to participate in the study.

Method of sampling

Using probability proportional to size (PPS) sampling: from a finite population in which a size measure was available for each population unit before sampling and where the probability of selecting a unit was proportional to its size: we collected 1,289 people from 30 village for Tra Vinh province.

Statistical analysis

The data was entered, verified and cleaned, using Epidata spread and the data analysis was done using STATA. Continuous variables were summarized by medians and interquartile ranges, and categorical variables were summarized by frequency and percentage.

Consent to participate

The consent to participate in the study was taken from all study participants because the study only recorded patients who provided written consent. Patients who declined consent were not denied their services.

RESULTS

A total of 1,289 patients were provided informed consent to participate in this study. The positive reaction with HBsAg was 99 sample (7.68%), and most of the participants were negative with HBsAg (92.32%), that shows in Table 1.

Table 1: The prevalence of hepatitis B virus infection in study subjects (n=1289).

	Frequency	Percentage
HBsAg (+)	99	7.68
HBsAg (-)	1190	92.32
Total	1289	100

An analysis of 1,289 people shows that almost people did not likely relative with family history of hepatitis B virus infection, just 2.48% people had household family members who had hepatitis B, only 1.24% people had history of household family members who had hepatocellular carcinoma, and only 0.93% people had household family members with cirrhosis, that shows in Table 2.

Table 2: The prevalence of hepatitis B virus infection in study subjects (n=1289).

History of hepatitis B virus infection		Frequency	Percentage
Household family members had hepatitis B	Yes	32	2.48
	No	1,257	97.52
Household family members had hepatocellular carcinoma	Yes	16	1.24
	No	1,273	98.76
Household family members had cirrhosis	Yes	12	0.93
	No	1,277	99.07

In the study, the result showed that the rates of HbsAg (+) were significantly different in the two groups. People who did not preventive vaccination for hepatitis B virus had a higher rate of HbsAg (+) than people get preventive vaccination for hepatitis B virus, with p=0.005. However, in other medical practice, the rates of HBsAg was non-significance, such as blood transfusion, surgery, dental

treatment, injecting medications, injected skin boils. That shows in Table 3.

Table 3: The relationship between hepatitis B infection and hepatitis B prevention practices in medical practice (n=1289).

Characteristics	HBsAg (+) N (%)	HBsAg (-) N (%)	P value
Preventive vaccination for hepatitis B virus			
Yes	6 (3)	199 (97)	χ^2=7.766
No	93 (9)	991 (91)	p=0.005
Blood transfusion			
Yes	3 (3.03)	96 (96.97)	χ^2=3.113
No	94 (7.9)	1096 (92.1)	p=0.078
Having surgery			
Yes	29 (7.37)	365 (92.63)	χ^2=0.081
No	70 (7.82)	825 (92.18)	p=0.775
Dental treatment			
Yes	60 (8.09)	682 (91.91)	χ^2=0.406
No	39 (7.13)	508 (92.87)	p=0.524
Injecting medications			
Yes	72 (8.09)	818 (91.91)	χ^2=0.680
No	27 (7.77)	372 (93.23)	p=0.410
Injected skin boils			
Yes	24 (6.5)	345 (93.5)	χ^2=1.008
No	75 (8.15)	845 (91.85)	p=0.315

[1]Wilcoxon signed-rank test; [2]Kruskal-Wallis rank test; [3]Spearman's rank correlation co-efficient

Table 4: The relationship between hepatitis B infection and hepatitis B prevention practices in daily life (n=1289).

Characteristics	HBsAg (+) N (%)	HBsAg (-) N (%)	P value
Acupuncture			
Yes	2 (4.76)	40 (95.24)	χ^2=0.5215
No	97 (7.78)	1,150 (92.22)	p=0.470
Sharing shaver			
Yes	3 (5.88)	48 (94.12)	χ^2=0.2421
No	96 (7.75)	1,142 (92.25)	p=0.623
Sharing toothbrushes			
Yes	0 (0)	23 (100)	χ^2=1.9482
No	99 (7.82)	1,167 (92.18)	p=0.163
Sharing nail tools			
Yes	27 (7.2)	348 (92.8)	χ^2=0.1721
No	72 (7.88)	842 (92.12)	p=0.678
Spraying tattoo			
Yes	5 (5.05)	94 (94.95)	χ^2=1.0460
No	94 (7.9)	1,096 (92.1)	p=0.306

The percentage of hepatitis B virus infection in the study were not significantly associated with hepatitis B prevention practices in daily life, including acupuncture, sharing shaver, sharing toothbrushes, sharing nail tools, spraying tattoo (Table 4).

DISCUSSION

The percentage of hepatitis recorded in this study was 7.68%. This figure is also relevant to that of other studies within the regional area and a country.[4-6] When compared to other studies conducted in Mekong Delta, Hau's study with 1,801 samples showed that the HBsAg carrier rate was 11±2%, which was 64.4±9.8% if including the copresence rate of 3 markers of HBsAg, anti-HBs, anti-HBc. In Tien Giang in 2016, a study by Tram et al with 1,224 people showed that the chronic hepatitis B prevalence was 9%.[5] In 2019, author Binh et al conducted a study showing that the rate of hepatitis B infection was 14.1% among Khmer patients at Tra Vinh Provincial General Hospital, Tra Vinh province.[6] Similarly, research on the Khmer population in Tra Cu district- Tra Vinh showed that this rate was 6.7% in 2021.[6] Likewise, a study by author Pham Van Linh and his colleagues in the Central region of Hue in 2006 on 217 people whose family members were HBsAg carriers, found 113 positive HBsAg carriers, accounting for 52% and 104 people with negative HBsAg (48%). Thus, in a family with positive HBsAg carriers, the rate of positive HBsAg carriers was 2.7 times higher than the general positive HBsAg rate (52/19.3). These rates show that Vietnam belongs to the group of countries with high prevalence and that HBV infection is still a serious health problem, especially the HIV co-infection rate among hepatitis B patients was also recorded to be relatively high, which is up to 9.7% according to a study at the Ho Chi Minh City Hospital for tropical diseases in 2018, which may further aggravate the patient's disease burden.[7] When compared to the overall level of the world, especially in countries with high prevalence such as China and Senegal, this figure was 11% and 13.8%, respectively.[8] Meanwhile, in low endemic areas including the US, Canada, western Australia, and parts of South and central America, the rate of people carrying HBsAg is less than 2%, while the proportion of people with a history of hepatitis B virus infection is less than 20%.[9] Regarding behavioral risk factors related to hepatitis B, it was noted that there was no vaccine to prevent hepatitis B, according to our study. Similarly, a study in Tra Vinh in 2021 by the author Le Thi Diem Trinh among Khmer population in Tra Cu district- Tra Vinh province shows that the factors related to an increased risk of chronic hepatitis B infection include not being vaccinated against hepatitis B, blood transfusion in the past, history of surgery- tattooing or dental procedures and acupuncture, in addition to the association with toothbrush sharing and being in a relationship with an individual who has a chronic hepatitis B infection.[6] In Tien Giang, Tram et al study in 2016 among 1224 individuals showed that the population with a history of surgery, tooth extraction, injecting, and skin sutures had statistically significant differences from the group that did not. There were groups of people who shared household razors, shared razors at barbershops and other services, shared toothbrushes, etc with non-shared groups, and HBV infection rates were not different.[5] In a similar study conducted in the Central region in 2018,

author Thanh et al study in the central highlands showed that the prevalence of hepatitis B virus infection in the central highlands was 11.1%.[10] The prevalence of HBV infection was different between men and women (12.9% versus 9.8%) and between age groups (age group 40-49 years old has the highest prevalence of 13.6 years) compared with other groups, and some factors that increase the risk of HBV infection include male gender, farming occupation, having relatives who suffer from liver diseases, and a history of dialysis.[10] Our study also had some limitations, this was a cross-sectionals study done at communities that can cause some biases become apparent such as selective memory, telescoping and exaggeration.

CONCLUSION

The percentage of hepatitis B virus infection in Tra Vinh province was 7.68%. The rate of hepatitis B among people in Tra Vinh province is relatively close to the general infection rate of Vietnam and is at a high prevalence in the world. There is a statistically significant relationship between the incidence of hepatitis B with preventive vaccination for the hepatitis B virus. Therefore, we recommend should be prepared more resources for screening, monitoring, and treatment of chronic hepatitis B infection and propaganda for the prevention of risk behaviors.

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