



AWARENESS OF HEPATITIS B INFECTION AMONGST THE PEOPLE OF SOUTHEASTERN ANATOLIA: A SEROPREVALENCE STUDY

Güneydoğu Anadolu Bölgesinde Hepatit B Enfeksiyon Farkındalığı: Seroprevalans Çalışması

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ABSTRACT

Objective: Viral hepatitis has become a silent epidemic worldwide. The aim of the present study is to determine the knowledge and awareness of Hepatitis B infection amongst patients who refer to our clinic and their relatives.

Materials and Methods: Two hundred and forty-four patients randomly selected among patients admitted to our clinic were included this study and data about awareness of Hepatitis were obtained. Then, hepatitis condition of the patients was determined by the enzyme-linked immunosorbent assay (ELISA) and the obtained data were compared.

Results: Seventy-two patients had hepatitis B surface antibody (+) (anti-HBs (+)). 25 patients had received three doses of the hepatitis B vaccine and 47 patients were unaware of their anti-HBs (+) status. 14 patients were Hepatitis B surface antigen (+) (HBsAg (+)). 11 patients had known HBsAg (+) and 3 patients were unaware of their condition.

Conclusion: Three patients with HBsAg (+) were not aware of their disease and this is a risk factor for our society. Therefore, Necessary tests for the infectious diseases should be applied to all patients admitted to the clinic.

Key Words: Hepatitis, Seroprevalence, Vaccination

ÖZ

Amaç: Viral hepatit, dünya çapında sessiz bir salgın halini almıştır. Bu çalışmanın amacı kliniğimize başvuran hastalar ve yakınları arasında Hepatit B enfeksiyonu hakkındaki bilinç ve farkındalığın belirlenmesidir.

Materyal ve Metot: Kliniğimize başvuran hastalar arasından rastgele seçilen 244 hasta çalışmaya dahil edildi ve hepatit farkındalığına ilişkin veriler elde edildi. Daha sonra hastaların hepatit durumu Elisa Testi ile belirlendi ve elde edilen veriler karşılaştırıldı.

Bulgular: 72 hasta anti-HBs (+) idi. 25 hastaya üç doz hepatit B aşısı uygulanmış olup, 47 hasta anti-HBs (+) durumundan habersizdi. 14 hasta HBsAg (+) idi. 11 hasta HBsAg (+) olduğunu bilmesine rağmen 3 hasta HBsAg (+) olduğundan habersizdi.

Sonuç: HBsAg (+) olan üç hasta hastalığının farkında değildi ve bu durum toplumumuz için bir risk faktörüdür. Bu nedenle, kliniğe kabul edilen tüm hastalara bulaşıcı hastalıklar için gerekli tetkikler yapılmalıdır.

Anahtar Kelimeler: Hepatit, Seroprevalans, Aşılama

INTRODUCTION

Hepatitis B virus (HBV) infection is an important major global public health problem.¹ This global problem has long been recognized by World Health Organization (WHO).² More than two billion people have been infected with HBV in the world. Globally, 350–400 million people suffer from chronic HBV infection.¹ HBV infection has a worldwide distribution. The prevalence of HBV infection among communities shows different proportions and is associated with geographical factors.³ Distribution of HBV is classified into three groups as “low, medium and high endemic region”.⁴ Turkey is considered as a medium endemic region.⁵ HBV is 100-times more infectious than the human immunodeficiency virus (HIV). Therefore, the fight against this disease is quite important especially in terms of Anatolia region where HBV is common.⁶ The most effective way to prevent HBV infections is vaccination. In Turkey, HBV vaccine has been included in the routine vaccination schedule since 1998 based on WHO recommendation. Infants at birth are vaccinated, then they are vaccinated two more times, at the end of their first month and six months.⁷

Health care workers are at risk for infection with bloodborne pathogens, including HBV, hepatitis C virus (HCV) and HIV. HBV has been observed in blood, saliva, semen, and other bodily secretions and fluids. HBV infection in dental professionals has been reported to be higher than the general population.⁸ Infections in a dental clinic can be spread via contact with blood, oral fluids, droplet splatter, aerosols, etc.⁹ To reduce the risk of hepatitis for dental health care providers, vaccination of the dental professionals and the patients is recommended against viral hepatitis. As individual protective pieces of equipment, dental professionals should use gloves, head caps, masks, goggles, etc.^{10,11} Since horizontal and vertical

transmission of HBV infection could be seen in the dental clinics¹² and even 4×10^{-5} mL of HBV-contaminated blood has been shown to cause the disease⁶, proper sterilization or disposable items should be used in the practice.

Horizontal transmission is often seen in endemic regions like Southeast Anatolia. Using common personal equipment and close contact with an infected person are thought to be responsible for the horizontal transmission of HBV. Horizontal infection may occur when infected objects, such as toothbrushes, razors, scissors, and manicure-pedicure sets are shared by everyone at home, at the barbershops and hairdressers.¹³ The aim of the present study is to determine the knowledge and awareness of infectious diseases amongst the patients who refer to our clinic and their relatives.

MATERIALS AND METHODS

Study Design

To prevent dental workers and patients from cross infections, routine blood analysis for infectious diseases (HBsAg, Anti-HBs, Antibody to HCV (Anti-HCV), Antibody to HIV (Anti-HIV), Hepatitis A IgM antibody (Anti-HAV IgM), IgM antibody against hepatitis B core antigen (Anti-HBc IgM) and IgG antibody against hepatitis B core antigen (Anti-HBc IgG) are requested from all patients who are admitted to our clinic. 244 patients (130 women and 114 men) who were treated at the Adiyaman University Faculty of Dentistry, Department of Periodontology clinics and the test results of other family members can be reached were selected for this study (sample size is consistent with the literature). The subjects involved in the study were told the aim and the content of the study, and they signed an approval form stating that they voluntarily participated in the survey. Each individual read and signed the Helsinki Declaration before joining the study. All procedures were approved by Adiyaman University Faculty of Medicine Ethics

Committee of Non-Interventional Clinical Investigations (No:2017/9-1).

In the first examination, the following information was obtained from the patients:

- Age
- Gender
- Profession
- Educational level
- Infectious disease status of family members
- Disease awareness
- HBsAg status
- Anti-HBs status
- Anti-HCV status
- Anti-HIV status

Laboratory Testing

The serological tests are requested from all patients before the treatment seance. Blood samples were analyzed by a specialist in the Microbiology Department. HBsAg was analyzed using the AUSAB (Abbott Laboratories, Abbott Park, USA) ELISA method and anti-HBs with the AUSZYME (Abbott Laboratories, Abbott Park, USA) monoclonal ELISA method.

Patients who have natural immune response or are HBsAg (+), were informed about the disease. The contagiousness of the disease and the risk for their family members were explained to the patients. Family of HBV (+) patients were consulted by the Department of Infectious Diseases. Routine blood analysis results of other family members were also obtained for infectious diseases. Anti-HBs (-) family members were informed about vaccination.

Interpretation of hepatitis B serologic test results was determined according to Table 1 from the Centers for Disease Control and Prevention (CDC).¹⁴

Table 1. Interpretation of serological test results.

Tests	Results	Interpretation	Need for vaccination
HBsAg anti-HBc anti-HBs	- - -	Not immune	Yes
HBsAg anti-HBc anti-HBs	+ + +	Immune due to natural infection	Not needed
HBsAg anti-HBc anti-HBs	- - +	Immune due to Hepatitis B vaccination	Not needed
HBsAg anti-HBc anti-HBc IgM anti-HBs	+ + + -	Acutely infected	A doctor should evaluate the situation considering the hepatitis B state of the patient
HBsAg anti-HBc anti-HBc IgM anti-HBs	+ + - -	Chronically infected	A doctor should evaluate the situation considering the hepatitis B state of the patient
HBsAg anti-HBc anti-HBs	- + -	There are four possible interpretations: (The test may need to be repeated.) 1. Resolved infection (most common) 2. False-positive anti-HBc, thus susceptible 3. "Low-level" chronic infection 4. Resolving acute infection	May or may not be needed

HBsAg; Hepatitis B surface antigen; **anti-HBc;** Hepatitis B core antibody; **anti-HBs;** Hepatitis B surface antibody; **anti-HBc IgM;** IgM antibody against hepatitis B core antigen

Statistical Analysis

Statistical package program SPSS 20 (SPSS, Inc, Chicago, IL) was used for data analysis. Differences in proportions, categorical variables and means were evaluated using Chi-square and Student's T-tests, respectively.

RESULTS

We did not detect any HCV and HIV infected patients in this study. In addition, no acutely infected patient was spotted. All HBsAg (+) patients were chronically infected [IgM anti-HBc (-)].

HBsAg incidence was found to be 5.7% and the proportion of the patients protected against the HBV was found to be 29.5% (Table 2).

Table 2. HBsAg and anti-HBs seroprevalence of the study population.

Tests	Results	Frequency	Percent (%)
HBsAg	Negative	230	94.3%
	Positive	14	5.7%
	Total	244	100.0%
anti-HBs	Negative	172	70.5%
	Positive	72	29.5%
	Total	244	100.0%

HBsAg; Hepatitis B surface antigen **anti-HBs;** Hepatitis B surface antibody

Vaccinated patients [Anti-HBs (+) and Anti-HBc (-)] were aware of their Anti-HBs (+) status. But, forty-seven naturally immunized patients [Anti-HBs (+) and Anti-HBc (+)] were not aware of their situation. (Table 3).

Table 3. Awareness of immunity due to natural infection and immunity due to Hepatitis B vaccination in anti-HBs (+) patients.

anti-HBc		History		Total
		anti-HBs (+) know	anti-HBs (+) do not know	
Negative	Count	22	0	22
	% within anti-HBs (+)	30.5%	0.0%	30.5%
Positive	Count	3	47	50
	% within anti-HBs (+)	4.2%	65.3%	69.5%
Total	Count	25	47	72
	% within anti-HBs (+)	34.7%	65.3%	100.0%

anti-HBc; Hepatitis B core antibody **anti-HBs;** Hepatitis B surface antibody

50% of the patients with natural immunity reported a familial history of the HBV (Table 4).

Table 4. HBV status of family members in patients who have immunity due to natural infection.

Tests		HBV status of family members			Total
		No	HBsAg (+)	anti-HBs (+)	
anti-HBs (+)	Count	25	3	22	50
anti-HBc(+)	%within anti-HBc (+)	50.0%	6.0%	44.0%	100.0%

HBsAg; Hepatitis B surface antigen; **anti-HBc;** Hepatitis B core antibody; **anti-HBs;** Hepatitis B surface antibody; **HBV;** Hepatitis B Virus

The prevalence of HBsAg (+) among patients decreased with increasing educational level. Moreover, the lowest occurrence rate of HBV infection was obtained in the health care workers group. Vaccination rate was much higher than the rate of natural immunity in the health care workers group (Table 5).

Table 5. Seroprevalence of HbsAg (+) and anti-HBs (+) in profession groups

Profession	Count	anti-HBs(+)			
		HBsAg (+)	anti-HBs (+)	anti-HBc (-)	anti-HBc (+)
Unemployed	21	2 (9.5%)	8 (38.1%)	1 (4.8%)	7 (33.3%)
Freelance	69	6 (8.7%)	16 (23.2%)	2 (2.9%)	14 (20.3%)
Educationalist	25	1 (4.0%)	13 (52.0%)	5 (20.0%)	8 (32.0%)
healthcare worker	49	1 (2.0%)	13 (26.5%)	10 (20.4%)	3 (6.1%)
Other	80	4 (5.0%)	22 (27.5%)	4 (5.0%)	18 (22.5%)
Total (%)	244	14 (5.7%)	72 (29.5%)	22 (9.0%)	50 (20.5%)

HBsAg; Hepatitis B surface antigen; **anti-HBc;** Hepatitis B core antibody; **anti-HBs;** Hepatitis B surface antibody

Three of the HBsAg (+) patients reported a family history of the disease (Table 6).

Table 6. HBV status of family members in HBsAg (+) patients.

HBsAg (+)		HBV status of family members			Total
		HbsAg (-) antiHBs (-)	HbsAg (+)	antiHBs (+)	
HBsAg (+)	Count	11	3	0	14
	% within HBsAg	78.6%	21.4%	0.0%	100.0%

HBsAg; Hepatitis B surface antigen; **anti-HBs;** Hepatitis B surface antibody; **HBV;** Hepatitis B Virus

Among 244 patients, 3 patients with HBsAg (+) were either not aware of their disease or did not want to disclose it. This

amounts to 1.2% of the sample in the study, which is a risk factor for the society. The ratio of the patients who know that they have HBsAg (+) was 4.5% (Table7).

Table 7. Awareness of HBsAg (+) status in HBsAg (+) patients.

HBsAg (+)		Awareness of HBsAg (+)		Total
		Do not know	Know	
HBsAg (+)	Count	3	11	14
	% within total samples	1.2%	4.5%	5.7%

HBsAg; Hepatitis B surface antigen

DISCUSSION

Hepatitis B still remains a major global public health problem.¹⁵ This condition is related to both the continuing frequent occurrence of new infections and to the common use of objects, utensils with chronically infected person.¹⁶ In the September 2010 report of European Centre for Disease Prevention and Control (ECDC)¹⁷, Turkey seems to have the highest number of prevalence of HBV in Europe with a prevalence of 2-8%. In Turkey, there are around 3.5 million cases, so to protect the patients and the health workers, dentists have an important role and responsibility.

According to the World Health Organization classification, Turkey has intermediate (2%-8%) endemicity for hepatitis B. This data has been obtained mainly from seroprevalence studies. Based on these studies, the overall prevalence of HBsAg positivity, which is an important parameter for chronic hepatitis B infection, has been reported to be between 4.0% and 5.0%.¹⁸ The prevalence of anti-HBc positivity (indicating current or previous exposure to HBV infection) ranges between 26.2% and 68.8% in Turkey.¹⁹ In the current study HBsAg (+) rate was found to be 5.7%, which is slightly higher than the reported values, and Anti HBs (+) rate was found to be 29.5%, which is within the reported values.

It was reported that the horizontal transmission is quite common in Turkey, especially in Southeast Anatolia. Horizontal transmission by non-sexual close contact is common for acute HBV infection in countries

with moderate HBV region.²⁰ In communities with poor socioeconomic conditions, transmission between family members may occur. Therefore, in the current study, we investigated the Hepatitis status of the all other family members of patients diagnosed with chronic hepatitis B infection. Forty-seven naturally immunized patients were not aware of their immunization status and family members of a total of fifty naturally immunized patients were recommended to consult with their family physician. A familial history of hepatitis B infection was reported in 50% of the patients who have natural immunity. We directed all anti-HBs (-) family members to a specialist for vaccination. When we investigated the HBsAg (+) patients' family, three of these patients' brothers were found to have hepatitis B surface antigen. In anamnesis, we learned that they have used the same razors with their HBsAg (+) brothers. Since the number of family member who lives at the same house is high in Turkey, and pieces of equipment such as toothbrushes, razors, scissors, and manicure-pedicure sets are shared by everyone at home, the transmission of the virus between family members could be related to the use of common utensils and tools.²⁰ Physicians and dentists have an obligation to warn the people who are admitted to their clinics about these bloodborne infections. We directed all family members of HBsAg (+) patients to a family physician for vaccination and preventive care.

Hepatitis B is an important occupational risk for health care workers.¹⁻³ In some studies, health care workers have been shown to have an up to four-fold increased risk of acquiring HBV infection.^{22,23} Although health care providers are believed to be at higher risk for acquiring bloodborne viral infections compared to the general population, the lowest occurrence of HBsAg (+) was found in health care workers and educationalist groups, which suggests that rate of HBsAg (+) individuals decreases with increasing

education. Preventive vaccination against hepatitis B for health care providers is a standard practice in many countries like Turkey.^{24,25} Thus, vaccination rate was found to be also higher than the rate of natural immunity in the health care worker group, which could be related to the awareness of the disease among this group in our study.

In this study, three patients with HBsAg (+) who were not aware of their disease were found. This amounts to 1.2% of the sample in the study which is a risk factor for our society. When the patients apply to our clinic, dentists should consult a specialist before the treatments in order to decrease the bloodborne infections risk.

WHO's primary goal on Hepatitis is to further reduce the global mortality and morbidity related to viral hepatitis.¹⁻³ The global control of viral hepatitis infection remains one of the major missions that need to be continued in this century.¹⁶ Knowledge and approach of the dentists play a key role in prevention of spread of these bloodborne infections.²⁶ In Turkey, HBV infection is generally spread horizontally but vertical spreading is also significant.¹³ In our clinic, we want to raise awareness of these infectious diseases, because awareness and knowledge are important for protection from diseases.

The shortcoming of this study is the smallness of the sample size: more specifically, the number of family members that we were able to reach could be larger for better results. Another drawback is that we studied the family members of only two types of patients with HBsAg (+) and Anti-HBs (+), which should be extended to HBsAg (-) and anti-HBs (-).

CONCLUSIONS

Hepatitis is a serious global public health problem that affects more than two billion people, constituting a problem that concerns everyone in the society. Dentists hold

especially great responsibility for the prevention and handling of this problem. In short, the aim of this study was to increase vaccination rate and preventive care among our patients and their families and to increase the early detection rate of bloodborne infectious diseases. On the other hand, improvement of the recording system of the patients and general increase of awareness about these infectious diseases are the other goals of this current study.

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