

Seropositivity of HBsAg, Anti-HBs, Anti-HCV and Anti-HIV in patients admitted to Siirt Training and Research Hospital

Siirt Eğitim ve Araştırma Hastanesi'ne başvuran hastalarda HBsAg, Anti-HBs, Anti-HCV ve Anti-HIV seropozitifliği

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ABSTRACT

Objective: Viral hepatitis infections, including hepatitis B and C, and HIV represent an important public health problem worldwide. In this study, we aimed to investigate the seropositivity of HBsAg, Anti-HBs, Anti-HCV, and Anti-HIV in patients who applied to our hospital between 2019 and 2021.

Methods: In this study, the frequency of HBsAg, Anti-HBs, total Anti-HCV and anti-HIV in patients admitted to our hospital between January-2019-January 2021 was evaluated retrospectively.

Results: HBsAg positivity was determined as 3.28% in a total of 52420 patients. HBsAg positivity was found to be 4.12% (95%CI: 3.9-4.3) in males, whereas 2.67% (95%CI 2.56-2.78) in females. There was a statistically significant relationship between HBsAg positivity and gender and age ($p<0.001$). Anti-HBs level of 54.9% of the patients (95%CI: 44.6-45.6) was found to be sufficient for immunity (Anti-HBs >10 mIU / ml). While this rate was found to be 61.04% (95%CI: 60.5-61.5) in males, it was found to be 50.37% (95%CI: 50-50.7) in females. A significant relationship was found between Anti-HBs positivity and gender and age ($p<0.001$). General Anti-HCV positivity

ÖZET

Amaç: Hepatit B ve C dahil viral hepatit enfeksiyonları ve HIV, dünya çapında önemli bir halk sağlığı sorunu olmaya devam etmektedir. Bu çalışmada 2019 ile 2021 tarihleri arasında hastanemize başvuran hastalarda HBsAg, Anti-HBs, Anti-HCV ve Anti-HIV seropozitifliğinin araştırılması amaçlanmıştır.

Yöntem: Bu çalışmada 2019 ile 2021 tarihleri arasında hastanemize başvuran hastalarda HBsAg, Anti-HBs total, Anti-HCV ve anti-HIV frekansı retrospektif olarak değerlendirilmiştir.

Bulgular: Toplam 52420 hastada HBsAg pozitifliği %3,3 olarak belirlendi. Erkeklerde HBsAg pozitiflik oranı %4,2 (%95GA: 3,9-4,3), kadınlarda ise %2,67 (%95GA: 2,56-2,78) olarak bulundu. HBsAg pozitifliği ile cinsiyet ve yaş arasında istatistiksel olarak anlamlı ilişki bulunmuştur ($p<0,001$). Hastaların %54,9'unun (%95GA: 44,6-45,6) Anti-HBs düzeyi bağışıklık için yeterli bulundu (Anti-HBs >10 mIU/ml). Erkeklerde bu oran %61,04 (%95GA: 60,5-61,5) iken kadınlarda %50,37 (%95GA:50-50,7) olarak bulunmuştur. Anti-HBs pozitifliği ile cinsiyet ve yaş arasında istatistiksel olarak anlamlı ilişki bulunmuştur ($p<0,001$). Genel Anti-

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was found as 0.11% (95%CI: 0.09-1.01). There was significant relationship between age groups for anti-HCV positivity ($p<0.001$), whereas the relationship for gender was not significant ($p=0.934$). There was no statistically significant relationship between anti-HIV positivity and age ($p=0.307$) and gender ($p=0.999$). Anti-HIV positivity was determined as 0.3% (95%CI: 0.01-1.05).

Conclusion: As a result, viral hepatitis is an important health problem around the world and for our city. Vaccination, infection control programs, and public education can reduce the risk of new infections. Anti-HIV positivity was found to be very low in our city.

Key Words: Hepatitis, Anti-HBs, Anti-HCV, Anti-HIV, seropositivity

HCV pozitifliği %0,1 (%95GA: 0,09-1,01) olarak bulundu. Anti-HCV pozitifliği için yaş grupları arasında anlamlı ilişki varken ($p<0,001$), cinsiyete göre ilişki anlamlı değildi ($p=0,934$). Anti HIV pozitifliği ile yaş ($p=0,307$) ve cinsiyet ($p=0,999$) arasında istatistiksel olarak anlamlı bir ilişki bulunmamıştır. Anti-HIV pozitifliği %0,24 (%95GA: 0,01-1,05) olarak tespit edildi.

Sonuç: Sonuç olarak viral hepatit dünya çapında ve şehrimiz için önemli bir sağlık sorunudur. Aşılama, enfeksiyon kontrol programları ve halk eğitimi yeni enfeksiyon riskini azaltabilir. İlimizde anti-HIV pozitifliği çok düşük bulundu.

Anahtar Kelimeler: Hepatit, Anti-HBs, Anti-HCV, Anti-HIV, Seropozitiflik

INTRODUCTION

Hepatitis B and C and HIV infections represent an important public health problem worldwide and affect more people than Human Immunodeficiency Virus (HIV) (1,2). It is an inflammatory disease of the liver that negatively affects both direct and indirect health costs in both developed and developing countries (3). Hepatitis may or may not be contagious and is the most common of the infectious forms of viral diseases (4). It is the leading cause of disability and death and represents the seventh leading cause of death worldwide (5). Five types of viruses, A, B, C, D, and E, cause viral hepatitis, of which only B and C can occur acutely or chronically and can lead to chronic hepatitis (6).

Hepatitis infections are common diseases worldwide, and an estimated 2 billion people have been infected with hepatitis B (HBV) and 170 million people with hepatitis C (HCV) (7). Hepatitis B is the most common form of viral hepatitis, and around 57 million people worldwide are infected with hepatitis B virus (HBV) (8). It is more common in the Middle

East than in America, the prevalence range is 0.6% in Europe and Iraq and over 8% in Sudan (9). The number of individuals infected with HBV in the Eastern Mediterranean Region is more than 21 million (3.3% of the population). Besides, it has been suggested that the HBV prevalence rate in the general population may be higher than in blood donors (10). Hepatitis C affects about 3% of the world's population; however, it has a high prevalence of around 10% in developing countries of Africa, Asia, and South America. Also, Egypt has a high prevalence of 20% due to iatrogenic contamination (6).

In addition to the losses caused by the fulminant course in acute viral hepatitis, chronic liver disease, cirrhosis, and hepatocellular carcinoma that develop after HBV and HCV infections are important complications affecting human life and the high cost of both treatment and follow-up makes it important to prevent these diseases. The most effective method for protection from HBV infections today is vaccination. Vaccination is not yet possible in HCV infection (11).

According to December 2005 data of the World Health Organization, an average of 40.3 (36.7-45.3) million people in the world have been infected with the human immunodeficiency virus. The prevalence of HIV infection in adults in the world is 1.1%, and it is between 7.5-8.8% in Sub-Saharan Africa. In our country, according to the working yearbook of the Ministry of Health, 31 January 2019, a total of 19748 HIV-positive cases have been reported since 1985.

Although living standards have increased, vaccination programs have become widespread, social awareness has increased, and sufficient awareness has been established, HBV, HCV, and HIV infections still maintain their importance today (12). In addition to the low sociocultural level in our region, it is necessary to know and apply protection methods, especially from viral hepatitis, due to insufficient infrastructure and poor compliance with hygiene rules.

Numerous studies have been published on the prevalence of HBV and HCV in our country. Most of the studies have been done on blood donors. In this study, we aimed to determine the seroprevalence of HBs Ag, Anti-HBs, Anti-HCV, and anti-HIV in patients of various age groups who applied to our hospital.

MATERIAL and METHOD

In our study, we retrospectively evaluated the seroprevalence of HBs Ag, Anti-HBs, Anti-HBc total, Anti-HCV, and anti-HIV in patients of various age groups who applied to the clinics of Siirt Training and Research Hospital between January-2019-January 2021. Hepatitis markers (HBsAg, Anti-HBs, Anti-HBc Total, and Anti-HCV) were studied with the commercial chemiluminescent enzyme immunoassay technique (Architect i1000SR, Abbott, USA). Blood with Anti-HCV and Anti-HIV seropositivity was detected for the first time in our laboratory and with the same positive result in repeated screening results were considered suspicious for HCV and HIV infections. For verification, new blood samples are taken and sent

to Ankara Refik Saydam Hygiene Institute through the Provincial Health Directorate.

SPSS statistics package program (IBM SPSS Version 22.0) was used to evaluate the data. Data were presented as mean and standard deviation for groups. Chi-square test was used to determine the relationship between categorical variables (sex/age groups in terms of positivity). Independent groups t-test was used to compare a numerical measure with a two-group categorical variable (mean age by gender).

This study was approved by the Siirt University Non-Interventional Clinical Research Ethics Committee and the Republic of Turkey Ministry of Health. (Date: 22.01.2021 and Decision Number: 2021/01.03)

RESULTS

In this study, HBsAg positivity, Anti-HBs, Anti-HCV and Anti-HIV positivity were investigated in 52420, 49791, 49196 and 37660 patients, respectively. In more than one result, the most recent result was obtained.

When the general distribution of the patients was examined, it was found that 41.9% of the 52420 patients with HBsAg results were male and 58.1% were female, while the overall HBsAg positivity was 3.28% (95%CI: 2.5-4.1). When we evaluated according to gender, HBsAg positivity rate was found to be 4.12% (CI: 3.9-4.3) in males, whereas 2.67% (95%CI %: 2.56-2.78) in females. When evaluated according to age groups, the highest positivity rate was found in the 46-60 age group. In this age group, the positivity rate was found to be 8.43% (173/2066) (Table 1). There was a statistically significant relationship between HbsAg positivity and gender and age ($p<0.001$). Age shows a normal distribution. The mean age of the positive patients has been found as 38.2 ± 15.23 years.

In our study, to evaluate the results of Anti-HBs, the results of 49791 patients, including 21167 males (42.5%) and 28624 females (57.5%), were included in the study. Results are given in Table 2. Anti-HBs level

of 54.9% of the patients (95%CI: 44.6-45.6) was found to be sufficient for immunity (Anti-HBs> 10 mIU / ml). While this rate was found to be 61.04% (95%CI: 60.5-61.5) in males, it was found to be 50.37% (95%CI: 50-50.7) in females. A significant relationship was found

between Anti-HBs positivity and gender and age ($p<0.001$). Anti-HBs positivity was found to be higher in men (61.04%) and in the 16-30 age group (61.40%). The mean age of the seropositive has been found as 27.5 ± 15.60 years.

Table 1. Distribution of HBsAg positivity by age and gender

Variable	Group	Total (n)	Prevalence (%)	95%CI	OR (OR CI)	X ²	p
Gender	Male	21947	4.12	(3.92-4.32)	1.57 (1.42-1.73)	84.794	$p<0.001^*$
	Female	30473	2.67	(2.56-2.78)	1		
	Total	52420	3.28	(2.47-4.13)			
Age	0-15	6785	0.34	(0.21-0.47)	0.07 (0.04-0.119)		$p<0.001^*$
	16-30	27236	2.36	(2.24-2.48)	0.50 (0.42-0.59)		
	31-45	10935	5.08	(4.72-5.44)	1.10 (0.92-1.31)		
	46-60	3938	8.43	(7.60-9.269)	1.89 (1.56-2.29)		
	60 >	3526	4.65	(3.98-5.32)	1		
	Total	52420	3.28	(2.47-4.13)			

* $p<0.05$: significant relationship, $p>0.05$: no significant relationship, X²: Chi-square test

Table 2. Distribution of Anti HBs positivity by age and gender

Variable	Group	Total (n)	Prevalence (%)	95%CI	OR (OR CI)	X ²	p
Gender	Male	21167	61.04	(60.54-61.54)	1	559,698	$p<0.001^*$
	Female	28624	50.37	(49,99-50.75)	0.65 (0.62-0.67)		
	Total	49791	54.9	(44.62-45.58)			
Age	0-15	6909	61.20	(59,97-62,11)	1.16 (1.06-1.27)		$p<0.001^*$
	16-30	26689	61.40	(60.64-61.44)	1.17 (1.08-1.27)		
	31-45	10149	35.68	(34.85-36.51)	0.41 (0.38-0.45)		
	46-60	3258	45.98	(44.33-47.639)	0.63 (0.57-0.70)		
	60 >	2777	57.54	(55.76-59.32)	1		
	Total	49791	54.9	(44.62-45.58)			

* $p<0.05$: significant relationship, $p>0.05$: no significant relationship, X²: Chi-square test

In the present study, the Anti-HCV results of 49196 patients, including 20620 men (41.9%) and 28576 women (58.1%), were evaluated. General Anti-HCV

positivity was found as 0.11% (95%CI: 0.09-1.01). When evaluated according to gender, Anti-HCV positivity was found to be 0.1% in both males (21/20620) and females

(31/28576) (Table 3). There was significant relationship between age groups for Anti-HCV positivity ($p < 0.001$), whereas the relationship for gender was not significant ($p: 0.934$). Anti-HCV positivity was found to be higher in the over 60 group (0.44%) (95%CI: 0.23-0.65). The mean age of the positive patients has been found as 51.8 ± 19.63 years.

In addition, in our study, the Anti-HIV results of 37660 patients, 15101 males (40.1%) and 22559

females (59.9%), were evaluated. While general Anti-HIV positivity was determined as 0.03% (95%CI: 0.01-1.05), when evaluated by gender, Anti-HIV positivity was found to be 0.03% both in males (95%CI: 0.01-0.05), and females (95%CI: 0.02-0.04) (Table 4). There was no statistically significant relationship between Anti-HIV positivity and age ($p: 0.307$) and gender ($p: 0.999$). The mean age of the positive patients has been found as 41.6 ± 22.32 years.

Table 3. Distribution of Anti-HCV positivity by age and gender

Variable	Group	Total (n)	Prevalence (%)	95%CI	OR (OR CI)	X ²	p
Gender	Male	20620	0.10	(0.07-0.13)	1	0.007	0.934
	Female	28576	0.11	(0.09-0.13)	1.07 (0.61-1.85)		
	Total	49196	0.11	(0.09-1.01)			
Age	0-15	4782	0	(0-0)	(0-0)	p<0.001*	
	16-30	26959	0.04	(0.02-0.06)	0.10 (0.05-0.21)		
	31-45	10411	0.10	(0.05-0.15)	0.22 (0.10-0.48)		
	46-60	3652	0.41	(0.30-0.52)	0.93 (0.45-1.90)		
	60 >	3392	0.44	(0.23-0.65)	1		
	Total	49196	0.11	(0.09-1.01)			

* $p < 0.05$: significant relationship, $p > 0.05$: no significant relationship, X²: Chi-square test

Table 4. Distribution of Anti-HIV positivity by age and gender

Variable	Group	Total (n)	Prevalence (%)	95%CI	OR (OR CI)	X ²	p
Gender	Male	15101	0.03	(0.01-0.05)	0.98 (0.28-3.49)	0,001	0.999
	Female	22559	0.03	(0.02-0.04)	1		
	Total	37660	0.03	(0.01-1.05)			
Age	0-15	1983	0	(0-0)	(0-0)	4.055	0.307
	16-30	21996	0.02	(0.01-0.04)	0.24 (0.04-1.33)		
	31-45	8356	0.04	(0.01-0.08)	0.48 (0.08-2.899)		
	46-60	2638	0.04	(0.03-0.11)	0.51 (0.05-5.62)		
	60 >	2687	0.07	(0.03-0.17)	1		
	Total	37660	0.03	(0.09-1.05)			

* $p < 0.05$: significant relationship, $p > 0.05$: no significant relationship, X²: Chi-square test

DISCUSSION

Although viral hepatitis has been known for centuries, it is an important public health problem both in the world and in our country due to its high morbidity and mortality and major economic losses (13). Despite the increase in living standards, widespread vaccination programs increased social awareness, and sufficient awareness, HBV, HCV, and HIV infections still maintain their importance today (13,14).

Even though the global incidence of HBsAg has been declining due to successful vaccination programs, Chronic hepatitis (CHB) remains the leading cause of liver cirrhosis and hepatocellular carcinoma (HCC)-related deaths. It is predicted that 887.000 people die each year (15). In Turkey, about 2% of the population is thought to be HBsAg positive, and complication of HBV infection is known to cause 40-50% of liver transplantations between 2012 and 2016 (16,17).

In recent years, several significant epidemiological studies covering the whole of our country have been conducted. The Association of Turkish Liver Surveys (TKAD) reached 5471 people over the age of 18 in a study performed between 2008 and 2011. It was reported that HBsAg positivity was 4%, anti-HBc total positivity was 30.6% and Anti-HBs positivity was 32%. The study reported that HBsAg positivity was lower in western areas while significantly higher in Central Anatolia, Eastern Anatolia, and Southeastern Anatolia. In this work, HBsAg positivity was found as 3.28% and anti-HBs was found as 54.9%. HBsAg seroprevalence varies between 3.9 and 12.5 percent in our country according to the regions, and the anti-HBs seroprevalence varies between 20.6 and 52.3 percent (13). According to other epidemiological studies, the highest rate of HBsAg positivity in our country is in the Southeast region with 4.1 percent and the lowest rate is in the Black Sea region with 1.7 percent (13,18). In the previous studies in our country, Çetinkol et al. (14), Kalaycı et al. (19), Demirpençe et al. (20), Pehlivanoğlu et al. (21), Eratilla et al. (13), Yalçın and Kaya (22) and Yıldız-

Kaya and Kaya (15) reported HBsAg positivity as 4.6%, 1.9%, 12.6%, 3.27%, 11,32%, 2,08% and 1.9%. respectively. In our study, HBsAg positivity was found to be 3.28% between 2019-2021.

When we evaluate previous studies regarding anti-HBs, Eratilla et al. (13) reported anti-HBs positivity as 44.7%. In another recent study, Yıldız-Kaya and Kaya (15) have reported anti-HBs positivity as 54.2%. we found anti-HBs positivity as 54.9%.

In a study in Siirt investigating HBsAg and Anti-HBs seropositivity between 2008-2009 (23), HBsAg seropositivity was reported as 10% in 10630 exemplars and Anti-HBs seropositivity was reported as 48% in 5659 exemplars. In our study, HBsAg and Anti-HBs seropositivity between 2019-2021 was investigated. We found HBsAg seropositivity as 3.28% in 52420 exemplars and Anti-HBs seropositivity as 54.9% in 49791 exemplars. In our country, Hepatitis B vaccine was included in the expanded vaccination program in 1998 and started to be applied free of charge. Between 2005 and 2009, Hepatitis B vaccination was carried out in primary and secondary education. In our study, the highest Anti-HBs positivity in the 0-15, 15-30 age groups may be due to the vaccination program. In addition, the high level of Anti-HBs in men may be due to Hepatitis B vaccination in military service in some periods and the obligatory Hepatitis B vaccination in some professions.

It is estimated that approximately 130 to 210 million people worldwide are chronically infected with HCV (22). In Northern Europe, where the assumed prevalence is the lowest, HCV prevalence is less than 1%. The countries of Asia and Africa are among those with a high prevalence. HCV hepatitis is less prevalent in Turkey than HBV hepatitis, but it may have a higher risk of chronicity. The prevalence of hepatitis C has been reported between 0.4 to 2.2% in our country (22,24,25). In studies conducted in our country, the prevalence of hepatitis C in the Diyarbakır region was 0.93%, in the Batman region 0.72%, in the Aksaray region as 0.6%, in the Van region 0.8% and in the Şanlıurfa region 2.6% and (13,20,22,26,27). In a study

in Siirt investigating Anti-HCV seropositivity between 2008-2009 (23), Anti-HCV seropositivity was reported as 0.6% in 7711 exemplars. In our study, we found Anti-HCV seropositivity as 0.11% in 49196 exemplars. In the present study, Anti-HIV positivity was determined as 0.03% in 15101 exemplars. In previous studies carried out in our country, Çetinkol (14) found Anti-HIV positivity as 0.009%, Demirpençe et al. (20) as 0.015%, and Eratilla et al. (13) as 0.0005%. Seroprevalence values for HBV, HCV, and HIV determine in the present study are similar to those in our country.

Healthcare workers are the most important risk group for HBV. These include dentists, maxillofacial surgeons, nurses, dental technicians, laboratory workers, medicine, dentistry, and nursing students. The average risk of anyone getting HBV is 5.0%. However, this rate rises to 13-28% for dentists (28).

As a result, Hepatitis and HIV infection complications continue to be serious health problems around the world. Therefore, determining chronic carriers is still an important point in preventing

these diseases. Due to the complications that occur during hepatitis and HIV infections, the chronicity of cases requiring lifelong follow-up, and the financial dimension of cases requiring treatment, identification of infected individuals will contribute to the prevention, control, and treatment programs. Although our country is still in the middle endemicity region (2-10%) in terms of HBV, it is noteworthy that HBsAg seropositivity gradually decreases as a result of the national vaccination program. In the coming years, our country may be included among the countries in the low endemicity (<2%) region as a result of precautions, such as the public having more information about the disease, the implementation of effective vaccination programs and screenings performed before marriage or for different reasons. Therefore, we think that determining seroprevalences with new epidemiological studies, informing the society, and taking necessary precautions should be the main target.

ETHICS COMMITTEE APPROVAL

* The study was approved by the Siirt University Non-Interventional Clinical Research Ethics Committee (Date: 22.01.2021 and Number: 2021/01.03).

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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