



Positive Status of Hepatitis B Virus Seroprevalence in Local People and Immigrants

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ABSTRACT

Background In our study, we aimed to examine the seroprevalence of hepatitis B virus (HBV) infection and whether there is a sociodemographic difference between the two groups according to the hepatitis B surface antigen (HBsAg) results obtained in the blood samples given by the Turkish population and Syrian immigrants living in Bursa in their primary, secondary, and tertiary care applications.

Material and Methods All patients with HBsAg serology who applied to family health centers, migrant health centers, 2nd and 3rd level hospitals in Bursa province during the 5-year period from January 2017 to the end of December 2021 were included in our study.

Results During our study, HBsAg tests were taken from 955,528 people until the end of 2017-2021. The rate of Turkish citizens was 96.1% (n: 918,140), and the rate of Syrian origin was 3.9% (n: 37,388). Of all patients, 39.4% (n: 376,388) were male, and 60.6% (n: 579,140) were female. The HBsAg test was negative in 96.4% (n: 921,582) and positive in 3.6% (n: 33,946) of the patients. HBsAg positivity was found to be 3.6% in Turks and 2.4% in Syrians. HBsAg positivity was found to be 4.6% in men and 2.9% in women. The highest HBsAg positivity rate was 7.4% in the 50-59 age group.

Conclusions The dissemination of the hepatitis B vaccine, which is currently in use, seems to be the most crucial weapon in the hands of humanity to prevent this infection and the diseases it will cause.

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Introduction

Hepatitis B virus (HBV) infection is one of the most common infectious diseases in the world. Being responsible for acute hepatitis, chronic hepatitis, liver failure, hepatocellular cancer, and related deaths makes it a significant public health problem.¹ It is estimated that over 2 billion people worldwide are affected by HBV. In 2019, nearly 300 million people, 5% of the world population, were infected with chronic HBV.² 1.5 million new cases are added to these cases every year. If we add that 820,000 people die every year due to HBV and its cirrhosis and hepatocellular carcinoma, we wouldn't be surprised that it occupies the world agenda more than we expected.^{2,3}

The prevalence of HBV infection in developed countries varies between 2-8%.⁴ Shown risk factors for HBV infection include age, gender, geographical region, socioeconomic status, personal hygiene and hygiene status, lifestyle, and immune status.⁵ Due to the war that started in 2011, nearly 4 million civilians had to leave Syria. Turkey was the first to embrace the population forced to migrate from Syria. These civilians were resettled in various regions by the Turkish government. According to 2018 data, more than 150 thousand immigrants live in Bursa.⁶ The hepatitis B surface antigen (HBsAg) is the most commonly used serological agent in the detection of HBV infection, which is positive during all chronic hepatitis B infections, except for early acute hepatitis.⁷ Our study aimed to examine the seroprevalence of HBV infection and whether there is a sociodemographic difference between the two groups according to the HBsAg surface antigen results obtained in the blood samples given by the Turkish population and Syrian immigrants living in Bursa in their primary, secondary and tertiary care applications.

Material and Methods

The study was conducted after SBU Bursa Sehir Training&Research Hospital ethical Committee approval (2019-KAEK-140). The blood test results of people who applied to all family health centers, immigrant health centers, and 2nd and 3rd level state hospitals during the five years from January 2017 to the end of December 2021 were studied in the public health laboratory. Of the 955,528 patients, 918,140 were Turkish, and 37,388 were Syrian.

Then, the results of the Turkish and Syrian populations were compared. HBsAg results were also evaluated separately according to the gender and age groups of the patients (0-9, 10-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, 80-89 and 90-99).

Chemiluminescent Microparticle Immunoassay detected the presence of HBsAg antigen. The samples obtained by separating 10 cc blood samples from serum in the fully automatic COBAS 4000 device were performed by centrifuging patient samples (Roche Diagnostics, Germany).

Statistical analysis

The data of the study were analysed using 'The Jamovi project (2021) (Jamovi, Version 2.0.0) [Computer Software]'. Categorical variables were expressed as numbers and percentages (%). Chi-square or Fisher's exact tests were used to analyse whether there was a relationship between categorical variables. $p < 0.05$ was considered statistically significant. The power analysis of the study groups (Syria/Turkish) was calculated as 94% with G power 3.1.9.7 computer version.

Table 1. Sociodemographic features and HBsAg positive status.

Variables	n (%)
Gender	
Male	376,388 (39.4)
Female	579,140 (60.6)
HBsAg status	
Negative	921,582 (96.4)
Positive	33,946 (3.6)
Nationality	
Turkish	918,140 (96.1)
Syrian	37,388 (3.9)
Age status (years)	
0-9	23,323 (2.4)
10-19	56,768 (5.9)
20-29	242,241 (25.4)
30-39	190,213 (19.9)
40-49	131,712 (13.8)
50-59	109,654 (11.5)
60-69	99,445 (10.4)
70-79	66,834 (7.0)
80-89	29,557 (3.1)
90-99	5,781 (0.6)

Results

The sociodemographic characteristics of the study cohort were detailed in Table 1. Of the whole group, 60.6% were female, and 39.4% were male. The number of Syrian patients was less than that of Turkish patients (3.9% vs 96.1%). Most patients were in the 20-29, 30-39, 40-49, 50-59 and 60-69 age intervals, respectively.

In our study, the distribution by age and gender of 955,528 people who had the HBsAg test between 2017-2021 was given in Figure 1. The distribution of patients by nationality was shown in Figure 2 in detail. The distribution of HBsAg positivity in patients according to age was shown in Figure 3. Of the study population, 96.1% (n: 918,140) were

Turkish citizens, and 3.9% (n: 37,388) were of Syrian origin. Of these patients, 39.4% (n: 376,388) were male, and 60.6% (n: 579,140) were female. 96.4% (n: 921,582) of the tests were negative, and 3.6% (n: 33,946) were positive. In the power analysis of the study groups (Syrian/Turkish), the effect size was calculated as $d: 0.578$ and $N2/N1=0.0407$. The actual power was found to be 0.94.

The rate of HBsAg positivity in men was significantly higher than in women. HBsAg positivity was lower in the Syrian patient group than in the Turkish patient group (2.4% vs 3.6%). The highest HBsAg positivity rate was observed in the 50-59 age group (7.4%), followed by the 40-49 and 50-59 age groups (Table 2).

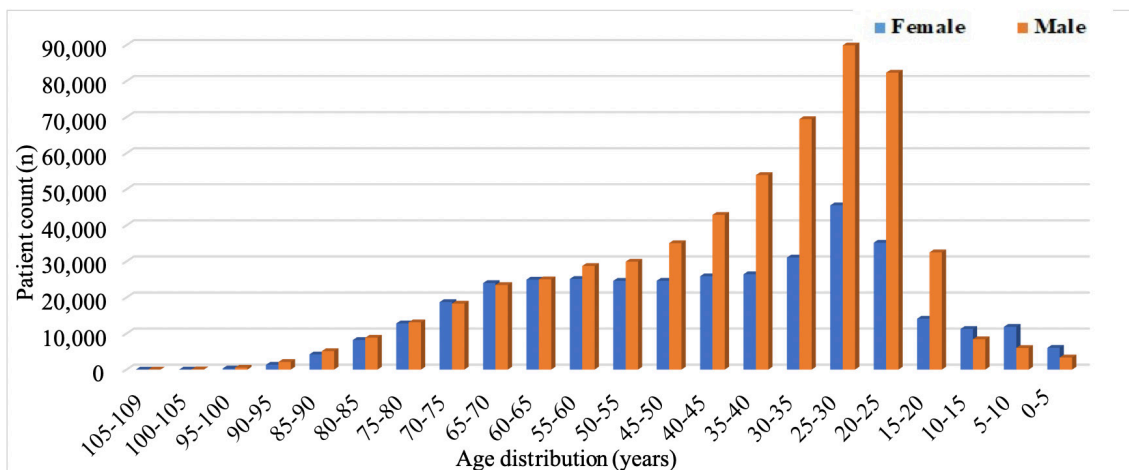


Figure 1. Distribution of patients by age and gender.

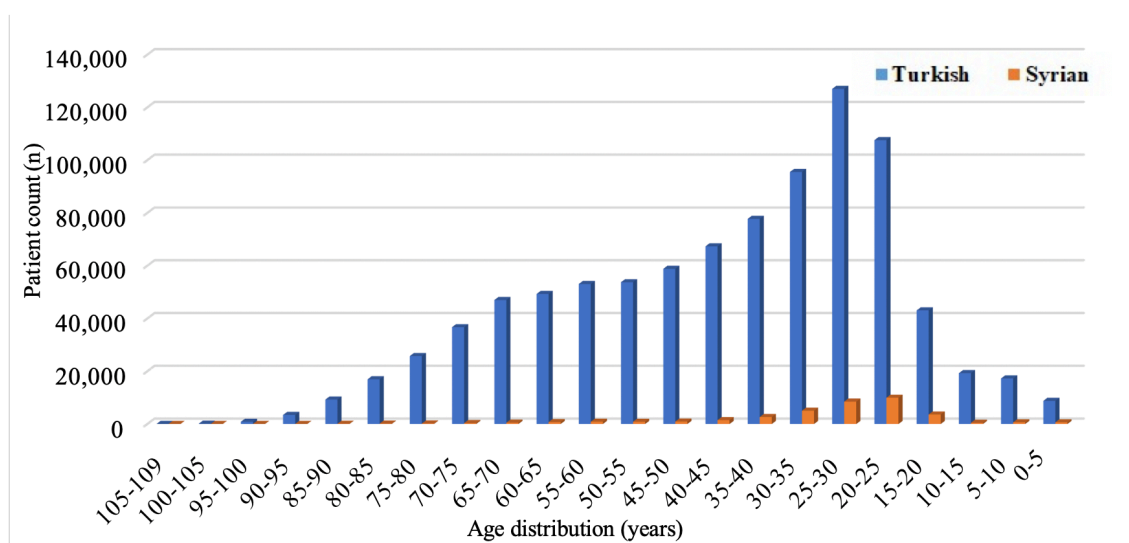


Figure 2. Age distribution of patients by nationality.

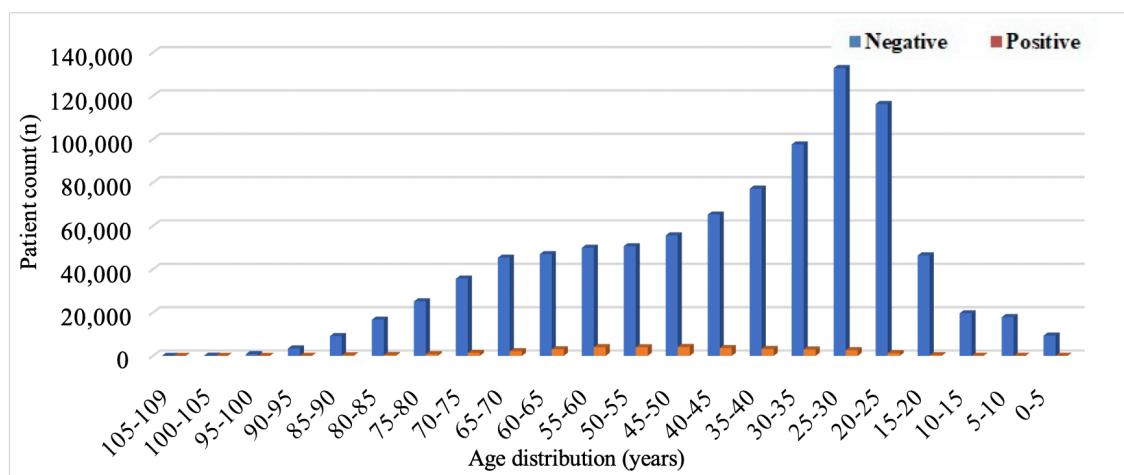


Figure 3. Distribution of HBsAg positivity in patients according to age.

Discussion

Regarding the prevalence of HBV, North America and eastern Europe are recognised as low-risk regions with a prevalence of <1%, the Middle East and India region with a prevalence of 2-5% are at intermediate risk, and southwest Asia, Africa and the eastern Pacific region with a prevalence of 5-10% are classified as high-risk regions.⁷ Turkey is located in the low-level risk zone, unlike other middle eastern countries. When we look at the studies reported from our country, it is remarkable that the results reported in some regions where HBsAg seropositivity is in a wide margin between 1.3% and 13.8% are above 10%, which may lead to determination as a high-risk endemic region.⁸ We attribute this result to the involvement of various sociodemographic factors since the studies conducted on different populations for HBV in different studies reported from our country included various geographical regions. In our research, HbsAg seropositivity was found to be 3.6% in Turkish cases, which confirms the data of the medium-risk HBV-risk region from Turkey and the world.

In a previous study in Bursa, HBsAg positivity was reported as 4.7% in Turkish patients, though it varies according to age groups.⁹ In another study, the estimated overall population prevalence was 4.57%.¹⁰ In a study conducted in Artvin province, HBsAg positivity was found to be 3.96%.¹¹ When we look at other studies reported from several regions of Turkey, it is seen that there is an increasing positivity rate going towards the South-

east Anatolia region. In the literature, there are studies in which HBsAg positivity was reported as 4.22%, 10%, 12.6%, 2.7%, 7%, and 5.5%.¹²⁻¹⁷ Our prevalence may be lagging behind the general prevalence rates reported from Turkey, which could be dependent on the high sociodemographic characteristics, relatively higher education level in the west, and it is based on a social life that is more compatible with hygienic conditions.

When the HBV prevalence by gender is examined in the literature, it has been observed that the prevalence of HBV is higher in males than females in all geographical regions. It has taken place in the global literature that predisposing factors such as more alcohol, smoking, not paying attention to hygiene conditions, and having more external procedures such as tattooing can be associated with a higher prevalence in the male gender.^{18,19} In our study, the prevalence of hepatitis B was found to be 4.6% (n: 16,956) in Turkish men and 2.9% (n: 16,102) in Turkish women. In a study previously reported from our country, the rate of males was reported as 4.71% and 3.30% in females.¹¹ When we glance at the other literature information reported from our country, it is seen that the prevalence of hepatitis B in men is higher than in women.^{12,13} In our study, the prevalence of HBV was 4.7% (n: 361) in Syrian men and 1.8% (n: 527) in Syrian women. Again, in line with the literature from the world, it is noteworthy that the prevalence is high in favour of men.^{18,19}

In the center of the Middle East, hepatitis infections are still a significant public health problem. According to a study reported from Syria,

Table 2. HBsAg positivity status of the patients according to the distribution of sociodemographic data.

Variables	Total patient count (n)	HBsAg		Test statistics
		Negative n (%)	Positive n (%)	
Gender				$\chi^2=1.992$
Male	376,388	359,071 (95.4)	17,317 (4.6)	p<0.001
Female	579,140	562,511 (97.12)	16,629 (2.87)	
Nationality				$\chi^2=157$
Turkish	918,140	885,082 (96.4)	33,058 (3.6)	p<0.001
Syrian	37,388	36,500 (97.6)	888 (2.4)	
Age intervals				$\chi^2=13.634$
0-9 years	23,323	23,274 (99.78)	49 (0.21)	p<0.001
10-19 years	56,768	56,516 (99.6)	252 (0.4)	
20-29 years	242,241	238,822 (98.6)	3,419 (1.4)	
30-39 years	190,213	184,233 (96.9)	5,980 (3.1)	
40-49 years	131,712	124,271 (94.4)	7,441 (5.6)	
50-59 years	109,654	101,521 (92.6)	8,133 (7.4)	
60-69 years	99,445	93,861 (94.4)	5,584 (5.6)	
70-79 years	66,834	64,490 (96.5)	2,344 (3.5)	
80-89 years	29,557	28,880 (97.7)	677 (2.3)	
90-99 years	5,781	5,714 (98.8)	67 (1.2)	

although there are regions such as the city of Aleppo where HBV prevalence is 10.6%, HBV in the general population has been reported as 5.62%.²⁰ The prevalence among Syrian immigrants in our country is 2.4%. The fact that they have a prevalence rate below the prevalence reported from their country can be explained by the fact that their living conditions are better than in the Middle East, that they do not apply for health care applications as quickly and frequently as in their own countries, and that they comply with the cleaning conditions during their stay in our country due to social pressure and traditions.

In our study, as we checked the age groups regarding HBsAg seropositivity, it was seen that the 50-59 age group had the highest rate. Other age groups were shown in Figure 3 in detail. In studies conducted in our country, it has been reported that the age groups 30-39, 41-50, 50-59 and 41-55 have the highest prevalence of HBV.^{9,11,12,14} In the study conducted in our province, in which the infectious agents of the Syrian and Turkish populations were compared, the age group with the highest HBV prevalence in Syrians was the age group of 30-39, which is similar to our study.⁹ When the world lit-

erature was reviewed, it was reported that the median age shifted from 44.1 to 50.2 and from 48.1 to 51.8, respectively, according to the analysis made from two separate health insurance data.²¹ According to a large-scale cohort study conducted in Hong Kong, it was observed that the average age, which was 41 in the early 2000s, increased to 55 by 2020.²² The routine vaccination of children in our country was started in August 1998, which may explain the high positivity in middle and advanced ages. It may also be associated with an increase in transmission during the sexually active period. The median age in the world literature is similar to the age group in our study. The advanced age group, the increasing life expectancy and the vaccination of young populations are compelling in that scene. It seems that HBV will keep its importance in our agenda for a long time, with the number of people infected with hepatitis B infection, to which more than 1.5 million new cases are added annually, and with the current 300 million cases.²³

Limitations of the study

The main limiting factors in our study were that the transmission routes of HBsAg-positive

patients were not questioned, and the vaccination status was not investigated. In addition, since the university hospital in our province is not affiliated with the Provincial Health Directorate, the data of this center could not be included in the study.

Conclusions

The dissemination of the hepatitis B vaccine, which is currently in use, seems to be the most crucial weapon in the hands of humanity to prevent this infection and the diseases it will cause. Family physicians, the cornerstone of preventive medicine for the hepatitis B vaccine, which has been applied free of charge for more than 20 years in our country, have a lot of work to do in the name of vaccine awareness and persuasion. It seems possible to live our lives without getting this infection when we reinforce the small measures we will take, such as complying with hygiene rules, using disposable or personalised cleaning products, safe transfusion practices, increasing health literacy, paying attention to the personal use of all kinds of devices that come into contact with blood, by popularising vaccination.

Ethical Approval

This study was carried out with the permission of Bursa Health Directorate Scientific Research Commission (protocol number: 00177454797).

Conflict of interest

The authors have no conflicts of interest to declare.

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Authors' Contribution

Study Conception: SM, CD; Study Design: SM, CD; Supervision: SM, CD; Literature Review: SM, CD; Critical Review: SM, CD; Data Collection and/or Processing: SM; Statistical Analysis and/or Data Interpretation: SM; Manuscript preparing: SM.

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