




Seroprevalence of HBsAg and anti-HCV for patients who admitted to third step hospital: Six-year retrospective data

Üçüncü basamak bir hastaneye başvuran hastalarda HBsAg ve anti-HCV seroprevalansı: Altı yıllık retrospektif veriler

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Abstract

Aim: We aimed to investigate the alteration and distribution of seroprevalence of hepatitis B and hepatitis C within the years according to age groups in patients who applied to our hospital.

Materials and Methods: The patients have been evaluated for six years retrospectively who were admitted to third step hospital in İstanbul. The duplicate results of patients who submitted more than one application within the same year were excluded from this study. Male and female patients were divided into four age groups as 0-14, 14-25, 25-49 and over 49 years old. Electrochemiluminescence method (Roche Cobas 6000, Germany) was used for HBsAg and anti-HCV assays.

Results: HBsAg positivity was 2.97% and anti-HCV positivity was 1.35%. HBsAg positivity was higher in males, and anti-HCV positivity was higher in females. No significant increase in seroprevalences of anti-HCV and HBsAg was observed during the six years observation period. HBsAg seroprevalences decreased in years especially in 0-14 and 14-25 year-old male groups. HBsAg seroprevalence was not decreased in the other age groups over the years. There was no significant difference in anti-HCV seroprevalence over the years. HBsAg positivity was higher in males and anti-HCV positivity was higher in females. Anti-HCV and HBsAg seroprevalence were not significantly differed over the years.

Conclusion: It was remarkable that HBsAg positivity rate had decreased over the years especially in 0-14 and 14-25 year-old males. Seroprevalence of HBsAg did not decrease in years in other age groups. There was no significant difference in the seroprevalence of anti-HCV during the measurement period.

Keywords: Anti-HCV, HBsAg, seroprevalence, age distribution.

Öz

Amaç: Çalışmamızda hastanemize başvuran hastalarda Hepatit B ve Hepatit C seroprevalansının yaş gruplarına göre yıllar içindeki değişimini ve dağılımını araştırmayı amaçladık.

Gereç ve Yöntem: İstanbul'da üçüncü basamak hastaneye altı yıl boyunca başvuran hastalar retrospektif olarak değerlendirildi. Aynı yıl içinde birden fazla başvuru yapan hastaların mükerrer sonuçları çalışma dışı bırakıldı. Kadın ve erkek hastalar 0-14, 14-25, 25-49 ve 49 yaş üzeri olmak üzere dört yaş grubuna ayrıldı. HBsAg ve anti-HCV testleri için elektrokemilüminesans yöntemi (Roche Cobas 6000, Almanya) kullanıldı.

Bulgular: HBsAg pozitifliği %2,97 ve anti-HCV pozitifliği %1,35 oranında saptandı. HBsAg pozitifliği erkeklerde, anti-HCV pozitifliği kadınlarda daha yüksek oranda idi. Anti-HCV ve HBsAg seroprevalansında 6 yıllık periyotta dikkati çekecek artış saptanmadı. HBsAg seroprevalansında özellikle 0-14 ve 14-25 yaş erkek gruplarında yıllar içinde azalma dikkati çekti. Diğer yaş gruplarında HBsAg seroprevalansında yıllar içinde bir azalma saptanmadı. Anti-HCV seroprevalansında ise yıllar içinde dikkati çekecek önemli bir fark saptanmadı.

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Sonuç: HBsAg pozitifliğinde özellikle 0-14 ve 14-25 yaş erkek gruplarında yıllar içinde azalma dikkati çekti. Diğer yaş gruplarında HBsAg seroprevalansında yıllar içinde bir azalma saptanmadı. Anti-HCV seroprevalansında ise yıllar içinde dikkati çekecek önemli bir fark saptanmadı.

Anahtar Sözcükler: Anti-HCV, HBsAg, seroprevalans, yaş dağılımı.

Introduction

Hepatitis B and hepatitis C viruses (HBV, HCV) are common public health problems all over the world, which cause acute and chronic liver disease or liver cancer. There are approximately 400 million HBV carriers in the world, half of whom are turned into the chronic liver disease (2,3). Between 30 and 210 million people are infected with HCV every year, and it is estimated that 150 million people are carriers of HCV in the world. Every year more than one million people die due to the acute or chronic effects of HBV and approximately 350,000 people die of same effects of HCV (1-3). We aimed to investigate the alteration and distribution of seroprevalence of HBV and HCV within years according to age groups in patients who applied to our hospital.

Materials and Methods

Collection of data

Between 01.01.2011 and 31.12.2016, patients were included in the study who admitted to various clinics in third step hospital in İstanbul. The test results of these patients were retrospectively evaluated in clinical microbiology laboratories.

Study of tests

HBsAg and anti-HCV assays were performed on a daily basis with the electrochemiluminescence assay (Roche Cobas 6000, Germany) as soon as the samples came to the lab.

Evaluation of data

Patients who did multiple referrals in the same year, donors for blood donation purpose and patients with chronic renal failure receiving continuous hemodialysis treatment were excluded from the study. Male and female patients were divided into four age groups: 0-14, 14-25, 25-49 and over 49 years old.

Statistical analysis

Chi-square test was applied for statistical evaluation. P value was considered significant as $p < 0.05$.

Ethics permission

The ethics of the work was provided by İstanbul Yeni Yüzyıl University, School of Medicine with 06.06.2017 / 030 number.

Results

Distribution of HBsAg and anti-HCV according to gender and age groups are given in Table-1. The seroprevalence of HBsAg and anti-HCV was 2.97% and 1.35% respectively in our patients. Seroprevalence of anti-HCV in male and female patients were similar to each other, whereas seroprevalence of HBsAg was higher in males in all age groups. The highest positivity for both types of hepatitis was found in patients over 49 years of age. It is understood that seroprevalence of HBsAg in both gender increased with age and seroprevalence of HBsAg in male was higher than in females (Table-2). Seropositivity of anti-HCV was not significantly different according to age and gender and there was no significant changing according to years (Table-3).

Table-1. HbsAg and Anti-HCV Positivity According to Age Groups and Gender.

Age group/gender	HBsAg			Anti-HCV		
	Positive/n	%	p	Positive/n	%	p
0-14						
Male	9/596	1.51		3/337	0.89	
Female	1/479	0.21		0/247	0.00	
Total	10/1075	0.93	0.049	3/584	0.51	0.267
14-25						
Male	13/1027	1.27		7/815	0.86	
Female	8/1253	0.64		0/759	0.00	
Total	21/2280	0.92	0.180	7/1574	0.44	0.016
25-49						
Male	484/12566	3.85		96/8101	1.19	
Female	263/15104	1.74		69/6167	1.12	
Total	747/27670	2.70	<0.001	165/14268	1.16	0.714
49 +						
Male	663/16328	4.06		194/13833	1.40	
Female	326/12052	2.70		170/9828	1.73	
Total	989/28380	3.48	<0.001	364/23661	1.54	0.044
Total						
Male	1169/30517	3.83		300/23086	1.30	
Female	598/28888	2.07		239/17001	1.41	
Total	1767/59405	2.97	<0.001	539/40087	1.30	0.361

n: Number of patients

Table 2. Distribution of HBsAg Positivity According to Age Groups and Gender.

Years Year Group/gender	2011		2012		2013		2014		2015		2016		2011-2017	
	Positive/n	%	Positive/n	%	Positive/n	%	Positive/n	%	Positive/n	%	Positive/n	%	Positive/n	%
0-14														
Male	1/32	3.13	2/44	4.55	1/77	1.30	1/67	1.49	3/160	1.88	1/216	0.46	9/596	1.51
Female	0/34	0.00	0/42	0.00	0/56	0.00	0/53	0.00	0/135	0.00	1/159	0.63	1/479	0.21
Total	1/66	1.52	2/86	2.33	1/133	0.75	1/120	0.83	3/295	1.02	2/375	0.53	10/1075	0.93
14-25														
Male	1/41	2.44	0/83	0.00	1/88	1.14	2/123	1.63	3/266	1.13	6/426	1.41	13/1027	1.27
Female	0/48	0.00	0/87	0.00	1/155	0.65	0/167	0.00	3/273	1.10	4/523	0.76	8/1253	0.64
Total	1/89	1.12	0/170	0.00	2/243	0.82	2/290	0.69	6/539	1.11	10/949	1.05	21/2280	0.92
25-49														
Male	29/805	3.60	122/2991	4.08	87/2062	4.22	59/1433	4.12	99/2270	4.36	88/3005	2.93	484/12566	3.85
Female	32/1695	1.89	57/3067	1.86	38/2279	1.67	40/1989	2.01	44/2379	1.85	52/3695	1.41	263/15104	1.74
Total	61/2500	2.44	179/6058	2.95	125/4341	2.88	99/3422	2.89	143/4649	3.08	140/6700	2.09	747/27670	2.70
49 +														
Male	85/2135	3.98	133/3184	4.18	102/2564	3.98	84/2214	3.79	132/2716	4.86	127/3515	3.61	663/16328	4.06
Female	61/1521	4.01	57/2311	2.47	48/1784	2.69	44/1592	2.76	51/1889	2.70	65/2955	2.20	326/12052	2.70
Total	146/3656	3.99	190/5495	3.46	150/4348	3.45	128/3806	3.79	183/4605	3.97	192/6470	2.97	989/28380	3.48
Total														
Male	116/3013	3.85	257/6302	4.08	191/4791	3.99	146/3837	3.81	237/5412	4.38	222/7162	3.10	1169/30517	3.83
Female	93/3298	2.82	114/5507	2.07	87/4274	2.04	84/3801	2.21	98/4676	2.10	122/7332	1.66	598/28888	2.07
Total	209/6311	3.31	371/11809	3.14	278/9065	3.07	230/7638	3.01	335/10088	3.32	344/14494	2.37	1767/59405	2.97

n: Number of patients who measured HbsAg.

Table-3. Distribution of Anti-HCV Positivity According to Age Groups and Gender.

Years Age Group/gender	2011		2012		2013		2014		2015		2016		2011-2017	
	Positive/n	%	Positive/n	%	Positive/n	%	Positive/n	%	Positive/n	%	Positive/n	%	Positive/n	%
0-14														
Male	1/2	50.0	2/10	20.0	0/11	0.00	0/22	0.00	0/117	0.00	0/175	0.00	3/337	0.89
Female	0/6	0.00	0/6	0.00	0/13	0.00	0/14	0.00	0/86	0.00	0/122	0.00	0/247	0.00
Total	1/8	12.5	2/16	12.5	0/24	0.00	0/36	0.00	0/203	0.00	0/297	0.00	3/584	0.51
14-25														
Male	0/28	0.00	1/42	2.38	1/60	1.67	0/110	0.00	3/242	1.24	2/333	0.60	7/815	0.86
Female	0/26	0.00	0/31	0.00	0/94	0.00	0/114	0.00	0/196	0.00	0/298	0.00	0/759	0.00
Total	0/54	0.00	1/73	1.37	1/154	0.65	0/224	0.00	3/438	0.68	2/631	0.32	7/1574	0.44
25-49														
Male	12/707	1.70	16/978	1.64	17/1320	1.29	21/1287	1.63	22/1930	1.14	8/1879	0.43	96/8101	1.19
Female	2/771	0.26	13/903	1.44	6/1075	0.56	15/1009	1.49	25/1145	2.18	8/1264	0.63	69/6167	1.12
Total	14/1478	0.95	29/1881	1.54	23/2395	0.96	36/2296	1.57	47/3075	1.53	16/3143	0.51	165/14268	1.16
49 +														
Male	29/2115	1.37	20/2034	0.98	32/2182	1.47	28/2153	1.30	42/2557	1.64	43/2792	1.54	194/13833	1.40
Female	35/1472	2.38	17/1423	1.19	21/1545	1.36	24/1539	1.56	38/1752	2.17	35/2097	1.67	170/9828	1.73
Total	64/3587	1.78	37/3457	1.07	53/3727	1.42	52/3692	1.41	80/4309	1.86	78/4889	1.60	364/23661	1.54
Total														
Male	42/2852	1.47	39/3064	1.27	50/3573	1.40	49/3572	1.37	67/4846	1.38	53/5179	1.02	300/23086	1.30
Female	37/2275	1.63	30/2363	1.27	27/2727	0.99	39/2676	1.46	63/3179	1.98	43/3781	1.14	239/17001	1.41
Total	79/5127	1.54	69/5427	1.27	77/6300	1.22	88/6248	1.41	130/8025	1.62	96/8960	1.07	539/40087	1.35

n: Number of patients who measured anti-HCV.

Discussion

Hepatitis B is a major global health problem. Hepatitis B prevalence is highest in the WHO Western Pacific Region and the WHO African Region, where 6.2% and 6.1% respectively of the adult population is infected. In the WHO Eastern Mediterranean Region, the WHO South-East Asia Region and the WHO European Region, an estimated 3.3%, 2.0% and 1.6% of the general population is infected, respectively. 0.7% of the population of the WHO Region of the Americas is infected (4). Turkey is also a middle endemic region for

the virus (5). Similarly, Hepatitis C is found worldwide. The most affected regions are WHO Eastern Mediterranean and European Regions, with the prevalence of 2.3% and 1.5% respectively. Prevalence of HCV infection in other WHO regions varies from 0.5% to 1.0%. Depending on the country, hepatitis C virus infection can be concentrated in certain populations (for example, among people who inject drugs) and/or in general populations (6).

Our study is an examining the distribution of these diseases for these factors and an investigating the change in this distribution over a period of six years. We

aimed to provide a contribution to the literature for the seroprevalance of Hepatitis B and C in the general population. So, we did not select a particular population as a study group. We tried to prevent an incorrectly low value by excluding donors for blood donation (i.e. persons with previously known Hepatitis B or C carriage may not admit or are refused for the blood donation.) and an incorrectly high value by excluding patients who receiving continuous hemodialysis treatment for chronic renal failure. We found the HBsAg positivity as 2.97% in all the patients who included in our study. The HBsAg positivity rate in the population except of the blood donor in our country has been reported to be 1.3% -13.8% and average of 7.6%. In addition, the HBsAg positivity rate in Turkey is reported to be increasing from west to east (7). This ratio seems to be consistent with the results of the studies that is determined in İstanbul which is located in the western part of Turkey. Turkey is also in the Middle East, South and Eastern Europe, South and Central America, Central Asia, Japan countries and regions are moderate endemicity. There are some studies showing the HBsAg positivity as between 1.5 to 15.9% of (2,3,8-11). The 3-13% rate of HBsAg positivity emerged in the study is similar to eastern Europe which is the closest region to us (2,12). In our study, we found anti-HCV positivity as 1.35% in all age and gender groups. When we look at the studies that conducted in this subject, we found that in developed countries the rate of anti-HCV positivity was 0.2-2.2% and in the developing countries was 7-10% (3,13-16). There are also a couple of studies reporting that this ratio has increased to 24% with varying factors such as children, adults, geographical differences, and risk groups (3,12,13). According to these studies in the literature, our results suggest that our region is endemic for HBV and low endemic for HCV in our study. The highest positivity rate for HBsAg was found in patients over 49 age (4.06% in males and 2.7% in females) and lowest in the 0-14 age group (1.51% in males and 0.21% in females) in our study. In a similar manner to ours in another academic study in Turkey, highest HBsAg positivity rate was in over 49 age and the 0-14 age group had the lowest value when compared to other age groups (10). It is also reported that the HBsAg positive rate, which is 5.2-3.3% in studies, decreased to 2.9-2.8% in 5-10 years (5,7,10). Alam et al. (11) in Pakistan found higher positivity in the 21-40 and 40-60 age groups than the other age groups. Iqbal et al. (9) in a study conducted in different regions of the United States, reported the highest HBsAg positivity rate at the 40-49 age group. They also stated that the HBsAg positivity was very low at the 0-9 years and over 70 age group. In this study, according to years, some regions have increased positivity and some regions have decreased. However, when studies are examined in general view, HBsAg seropositivity has declined over the years according to age groups in the world (12,17-19). In

studies, the high positivity rate of patients who over 50 years of age is due to the more applies to hospital than other age groups. At the same time, the prevalence of this disease varies according to the socioeconomic, geographical and other risk factors of the population. Easier access to health services in Turkey, Hepatitis B vaccine added to the routine immunization planning in 1998, the widespread using of disposable materials in medical interventions and the developing on the sterilization/disinfecting progress might have been effective in seropositivity decreasing. Variability of HBsAg positivity might also change according to the barber, blood transfusion, dental treatment, etc. which have been diseases contagious factors (9, 10, 12, 19, 20).

In our study, HBsAg positivity was higher in males than females. In some studies, HBsAg positivity was generally higher in men than in some age groups. In addition, they noted that the incidence of the disease may related to different occupational groups in males (10-12). About the age distribution of anti-HCV positivity, the highest positivity rate was found in patients over 49 years of age (1.4% in males and 1.7% in females) and lowest positivity rate in 0-14 and 14-25 age groups. When we look at the results of the studies conducted in the world, it is understood that anti-HCV positivity of 45 years old is higher than compared to other age groups (13-15,19-21). In a study conducted in South Asia, it was reported that the positivity of patients who over 55 years old was more than 7% (13,19). In some researches conducted in Turkey, over 50 age is recognized as an important risk factor for seropositivity (22). This situation also shows that the risk of HCV encountering with the age increases in the society.

In our study, anti-HCV positivity was higher in females than in males (1.4% and 1.3% retrospectively). Although there are lots of studies in the international literature that the anti-HCV positivity varies with age group and years, many studies emphasize that higher in females in total (3,13-15). There are also studies report that more HCV seropositivity of men in Europe and the United States (5,23,24). Some studies on HCV have shown that females have more spontaneous recovery than males (25). However, in some studies it has been shown that the elevation of seropositivity in females and blood transfusion may be related to the presence of unexamined male patients and their disregard for their illnesses. Tests for donors were not included in our study, and only the data of patients who applied to our hospital for treatment were evaluated. There was no significant change in anti-HCV positivity according to the results during this study. Similarly, in a study conducted in China by Niu et al. (15) as in our study, there was no significant increase in anti-HCV positivity over a five-year period. Galani et al. (26) reported that HCV was found at a range of 1% to 13% in different occupations and

patient groups during 15 years. Some studies have emphasized that observed a decrease in HCV seropositivity over the years (14,19). Factors such as occupations, patients who treated, geographical distribution and different risk factors affect the seropositivity of anti-HCV.

In conclusion, our study showed that anti-HCV is low endemic and HBsAg is compatible with mid-endemic seroprevalence. HBsAg positivity was higher in males

and anti-HCV positivity was higher in females. Generally, positivity rate was found to be compatible with the data of patients Turkey. A decrease was noted of HBsAg in the 0-14 and 14-25 year old male groups. There was no positivity rate to analyze of same age groups in female. In addition, there was no significant decrease in HBsAg seroprevalence over the years in other age groups. Lastly, there was no significant difference in the seroprevalence of anti-HCV during the years.

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