

Research Article

Evaluation of Hepatitis A and Isolated Anti-Hbc IgG Prevalences in A City of Eastern Anatolia

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Abstract

Background: Hepatitis A and hepatitis B are virological diseases which cause serious health problems worldwide and are closely related with social, economic, and cultural status of countries. Their seroprevalences change with varying social conditions. The purpose of our study was to evaluate hepatitis A and B encounter rates and anti-HAV IgG and Hbc IgG serological parameters in patients admitted to our clinic.

Method: Biochemical tests of the patients included in our study were studied using Mindray BS2000M autoanalyzer and Mindray kits in accordance with the instruction manual of the producer company. ELISA tests (HbsAg, anti-Hbs, anti Hbc IgG, and anti HAV IgG) were studied using Cobas 6000 e601 autoanalyzer and Roche kits with the chemiluminescence method in accordance with the instruction manual of the producer company.

Results: This study included 897 subjects (475 females and 422 males) who admitted to a gastroenterology clinic of our hospital for various reasons and had hepatitis viral parameters testing. In 874 study participants (97.4%) anti HAV IgG was positive. HAV IgG was positive in 465 of the 475 females (97.9%) and 409 of the 422 males (96.9%). There was not a statistically significant difference in anti HAV IgG positivity according to sex ($p=0.402$). Isolated anti Hbc IgG positivity rate was 3.7%. Isolated anti HbcIgG positivity rate was 3.2% in females ($s=15$) and 4.3% in males ($s=18$).

Conclusion: Anti-HAV IgG positivity rate in our study was 97.4%. Isolated anti Hbc IgG positivity rate was 3.7%. Both hepatitis A and hepatitis B encounter rates were detected to increase with age. High anti-HAVIgG positivity in our society warrants careful reviewing of our food and water resources. Moreover, informing public about contagiousness of hepatitis and implementing vaccination programs in a controlled fashion are among precautions that should be practiced.

Keywords: Hepatitis A seroprevalence; Isolated anti Hbc IgG positivity; Liver transaminases

1. Introduction

Hepatitis A and hepatitis B are virological diseases which cause serious health problems worldwide and are closely related with social, economic, and cultural status of countries. It is accepted that the clinical picture of viral hepatitis was first defined by Hippocrates. HbsAg (Australia antigen) was defined by Blumberg in 1963 and hepatitis A was defined by Finstone in 1973 [1, 2].

Hepatitis A is a nonenveloped, positive polarity RNA virus from Picornaviridae family with a size of 27 nanometers and it has a capsid in protein structure [3, 4]. Hepatitis A virus stays alive for a month in a humid environment at 25-42°C. Its incubation period is 15-50 days and main transmission way is fecal-oral route [4]. Hepatitis A was grown in cell culture in 1979 and since then various vaccines have been produced [4, 5]. Since 1992 safe and effective inactive hepatitis A vaccines have been used worldwide, especially in developed countries [6]. World Health Organization (WHO) classifies countries as very low, low, medium, and high endemic regions according to hepatitis A seroprevalence and recommends hepatitis A vaccination in very low, low, and medium endemic regions [5]. Annually, 1.5 million new cases of hepatitis A are reported worldwide and our country is considered medium endemic regarding hepatitis A [5, 6]. Hepatitis B is an enveloped virus from Hepadnaviridae family, which has a double helix, circular DNA and a diameter of 42 nanometers. It causes infection only in human hepatocytes. Worldwide around 400 million people are thought to be chronically infected with HBV [7]. Hepatitis B core antibody IgG (anti-Hbc IgG) is considered to be the most sensitive indicator of a previous HBV infection [8]. For Hepatitis B infection, HbsAg and anti-HbsAg negativity and anti-HBc IgG positivity in serum samples is called 'isolated anti-HBcIgG positivity' [9]. Introduction of effective Hepatitis B vaccines since the early 1980s has been very important to reduce cirrhosis and hepatocellular cancer risk due to hepatitis B in regions where hepatitis B is high or medium endemic [7]. In our country, every newborn is routinely vaccinated for hepatitis B virus since 1998.

2. Objective

To see the differences in hepatitis A and hepatitis B prevalences along with changing social conditions. The purpose of our study was to evaluate encounter rates for hepatitis A and B in patients admitted to our clinic, according to age and sex and report data about our region. In addition, we wanted to evaluate whether anti-HAV IgG and anti-Hbc IgG positivity which are lifelong indicators for encounters with hepatitis A and hepatitis B are only innocent

indicators or they have effects that can be associated with inflammation. To answer such questions we tried to reveal the values of liver transaminases in patients with anti-HAV IgG and isolated anti-Hbc IgG positivity.

3. Materials and Methods

Biochemical tests of the patients included in our study were studied using Mindray BS2000M autoanalyzer and Mindray kits in accordance with instruction manual of the producer company. ELISA tests (HbsAg, anti-Hbs, anti-Hbc IgG, and anti-HAV IgG) were studied using Cobas 6000 e601 autoanalyzer and Roche kits with chemiluminescence method in accordance with the instruction manual of the producer company. For numerical analyses in the study SPSS v22.0 software was used. Independent variable t-test or one-way ANOVA method was used in the comparison of continuous variables. The Z-test was applied for the comparison of the percentages between the two groups.

4. Results

Our study included 897 subjects (475 females and 422 males) whose viral serology parameters were studied in a 6 month period between February to July 2017. Anti HAV was positive in 874 (97.4%) of the study subjects (Table 1).

		Frequency	Percentage
Anti-HAV IgG	Negative	23	2.6%
	Positive	874	97.4%
Total		897	100
isolated anti-Hbc IgG	Positive	33	3.7%
	Negative	864	96.3%

Table 1: Viral serology parameters in a 6 month period between February to July 2017.

HAV IgG was positive in 465 of the 475 females (97.9%) and 409 of the 422 males (96.9%) included in the study. There was not a statistically significant difference in anti-HAV IgG positivity according to sex ($p=0.402$). Isolated anti-HbcIgG positivity rate was 3.7%. Isolated anti-HbcIgG positivity rate was 3.2% in females ($s=15$) and 4.3% in males ($s=18$) (Figure 1).

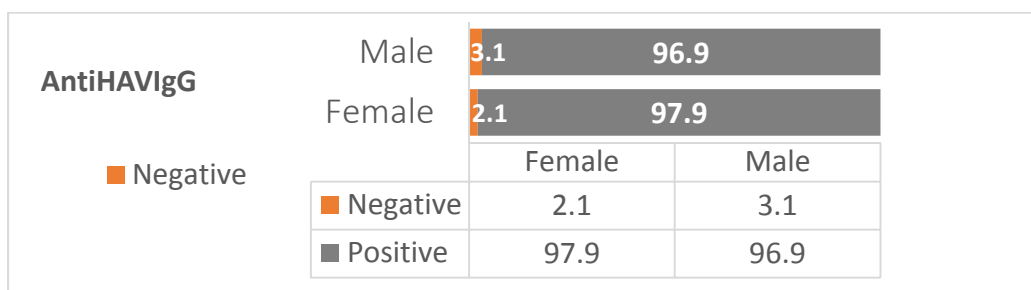


Figure 1: Anti-HAV IgG positivity in males and females.

The patients were evaluated by dividing into ten-years age groups. Over the age of 40 anti HbcIgG positivity rate increased to 14.1%. Anti-HAV IgG positivity was 92.1% in 16-29 age groups while it was achieving 100% over 50 years (Figure 2 and Figure 3).

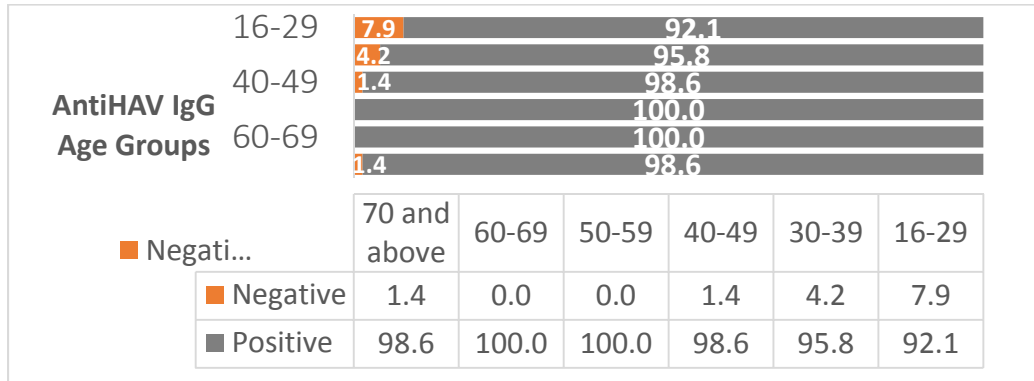


Figure 2: Anti-HAV IgG positivity between age groups.

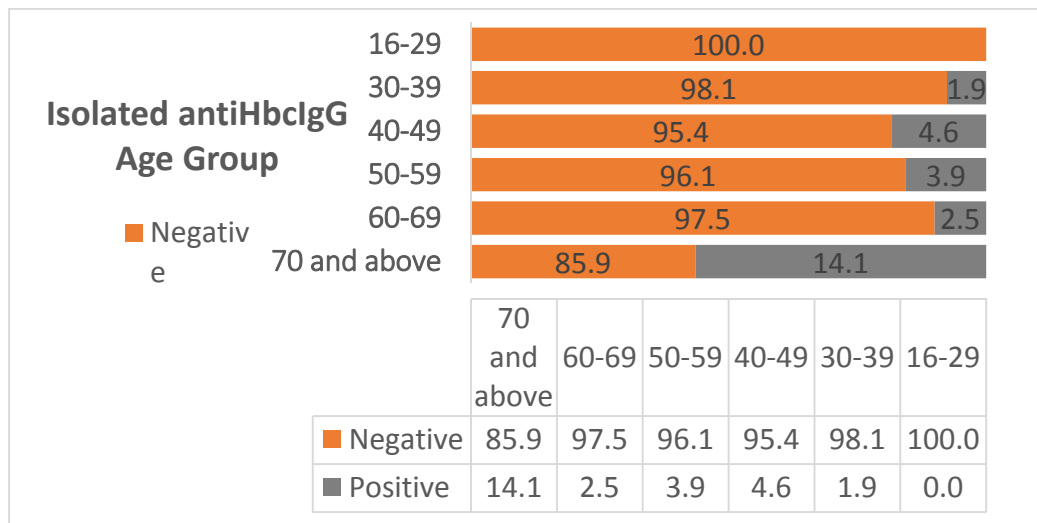


Figure 3: Isolated anti-Hbc IgG positivity between age groups.

Comparison of liver transaminases and cholestasis enzymes in anti-HAV IgG positive patients according to isolated anti-Hbc IgG positivity showed that AST, ALT, GGT, ALP, and LDH values were higher in isolated anti-Hbc IgG positive group but only the difference in ALP values reached to statistical significance (p=0.035).

Evaluation of liver transaminases and cholestasis enzymes according to anti-HAV IgG and anti-Hbc IgG positivity (Table 2).

	Group		Mean	Standard deviation	t	p
AST (U/L)	Isolated anti-Hbc IgG positivity	28	20.5	7.1	-0.550	0.583
	Anti-Hbc IgG negative	185	21.6	9.7		
ALT (U/L)	Isolated anti-Hbc IgG positivity	28	24.1	15.9	-0.345	0.731
	Anti-Hbc IgG negative	185	25.5	20.2		
GGT (U/L)	Isolated anti-Hbc IgG positivity	28	31.3	13.3	0.950	0.343
	Anti-Hbc IgG negative	179	27.7	19.3		
ALP (U/L)	Isolated anti-Hbc IgG positivity	28	97.2	26.5	2.117	0.035
	Anti-Hbc IgG negative	179	85.2	28.0		
LDH (U/L)	Isolated anti-Hbc IgG positivity	27	210.3	41.7	1.667	0.097
	Anti-Hbc IgG negative	171	194.2	47.3		

Table 2: Evaluation of liver transaminases and cholestasis enzymes according to anti-HAVIgG and anti-Hbc IgG positivity.

5. Discussion

Seroprevalence of hepatitis A virus which is closely associated with socioeconomic and cultural features of regions is classified as high, medium, or low endemic regions. South America, Eastern Europe and the geographic region including our country are considered to be medium endemic regions [4, 10]. In our country, hepatitis A prevalence varies according to regions and age groups. A study by Karadeniz et al which studied the prevalence of hepatitis A in Istanbul evaluated serum samples of 3868 patients between 1-79 years of age and found anti-HAV IgG positivity rate as 64.8%; the positivity rate was 89% above 46 years and 47% at 17-30 age range [10]. We evaluated patients over 16 years of age in Bingol province and found anti-HAV IgG positivity rate as 97.7%. Evaluation of patients above 16 years of age, according to 10 years age groups revealed that the lowest rate was in 16-29 age group (92%). Similar to the study by Karadeniz et al., anti-HAV IgG positivity rate was lower in the young age group but it was not as marked as the study in Istanbul province. Reasons for this include hygiene conditions, availability of clean water sources, and also lack of inclusion of hepatitis A in routine vaccination program yet. Temiz et al. studied 3952 subjects between 0-87 years of age in Diyarbakir province and found anti-HAV IgG positivity rate as 97.3% similar to our study. Also evaluation according to sex did not reveal a difference in anti-HAV IgG positivity in that study. The same study also evaluated anti-HAV IgG positivity rates and found hepatitis A seroprevalence higher than 90% in age groups above 10 years of age and 50% in 0-10 age group [11]. Cital et al. evaluated 3564 subjects in Adiyaman province and found anti-HAV IgG seropositivity as 77.5%. In the same study, anti-HAV IgG seropositivity rates did not differ according to sex; evaluation of seropositivity according to age revealed a rate of

80.2% in patients above 25 years of age and 95.5% above 40 years of age [12]. Turker et al studied hepatitis A seroprevalence in Ankara with 4606 subjects and found a seropositivity rate of 80.8%; seropositivity changed between 20.9-33.3% in 0-14 age group and the rate was 98% above 45 years of age [13]. In our study we could not find a difference because only adolescent and adult age groups were included in the study but studies in our country showed that although hepatitis A positivity rates are high in adults, hepatitis A encounter rate is lower in pediatric age group. This indicates that inclusion of hepatitis A vaccination to pediatric vaccination program in order to prevent acute hepatitis A infections in our country should be carefully evaluated.

Although many studies in our country and throughout the world have investigated hepatitis A seroprevalence studies that evaluated the prevalence of isolated anti-Hbc IgG positivity are not such frequent. In the absence of the HBsAg and anti-Hbs Ab positivity of only anti-Hbc IgG is called as isolated anti-Hbc IgG positivity. We detected this rate as 3.7% in our study that evaluated isolated anti Hbc IgG positivity which has established importance to determine the need for antiviral treatment against hepatitis B infection in patients with occult hepatitis B and in patients planned to receive immunosuppressive treatment. Evaluation according to age groups showed that isolated anti-Hbc IgG positivity was 0% in 16-29 years age group but increased with age and reached to 14% at above 70 years age group. This difference in isolated anti-Hbc IgG positivity rates between age groups may be due to inclusion of hepatitis B vaccine in routine vaccination program in our country after 1998 and sociocultural developments. Bozdemir et al. evaluated viral serologies of 22333 patients and detected Hbc IgG positivity rate as 3.74% similar to our study [14]. Ozdemir et al. evaluated 767 patients and found anti-Hbc IgG positivity rate as 5.8%; in this study they also detected that after vaccination for hepatitis B, percentage of subjects with antibody titers at a protective level was 91.4% [15]. A study by Koten et al in Sivas which evaluated blood of 987 blood donors, anti-Hbc IgG positivity rate was 21.1% and isolated anti-Hbc IgG positivity was 15.8% [9].

When we evaluated the relation between isolated anti-Hbc IgG positivity and liver transaminases, only ALP value was significantly different in anti-Hbc IgG positive group (97.2 U/L); because isolated anti-Hbc IgG positivity rate was very high in the elderly group this ALP elevation was thought to be due to osteomalacia particularly affecting this age group.

6. Conclusion

We found that although anti-HAV IgG positivity rates were lower in young age groups they were still high, and isolated anti-Hbc IgG positivity was not detected in 16-29 age group. We think that inclusion of hepatitis A vaccination in routine vaccination program such as hepatitis B vaccine, and increased efforts for public information regarding transmission of hepatitis will help to improve hepatitis A and B encounter rates.

7. Ethics Approval and Consent to Participate

Not applicable.

8. Competing Interests

The authors declare that they have no competing interests.

9. Authors' Contributions

Bçavuş analyzed and interpreted the patient datas.

10. Acknowledgements

Not applicable.

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