

Full Length Research Paper

Seroprevalences of hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) in preoperative patients admitted to a hospital in Northern Anatolia

Özgür Günel¹, Hüseyin Şener Barut¹, Ramazan Tetikçok², Nagehan Yıldız Çeltek² and Ilker Etikan³

¹Gaziosmanpaşa University, School of Medicine, Department of Infectious Diseases and Clinical Microbiology, 60100 Tokat, Turkey.

²Gaziosmanpaşa University, School of Medicine, Department of Family Medicine 60100 Tokat, Turkey.

³Gaziosmanpaşa University, School of Medicine, Department of Biostatistics 60100 Tokat, Turkey.

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Infections of hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) are considered important health problems worldwide. In this study, we assessed results of hepatitis B surface antigen (HbsAg), anti-HCV and anti-HIV tests which were ordered to patients before any surgical intervention in a university hospital, in Tokat, Turkey. All patients who were planned to have surgical intervention and had tests for HBsAg, anti-HCV and anti-HIV in year 2009 and 2010, were included in this retrospective study. Hospital records of patients were examined and 3794 subjects were included in the study. HBsAg and anti-HCV prevalences were found to be 3.4% (128/3782) and 2.2% (85/3736), respectively while no patient was positive for anti-HIV. It was found that the risk of HBsAg positivity was 2.07 times higher in males versus females; the HBsAg prevalence increased as patients became older and it was lowest in patients ≤ 29 years whereas highest in the age group of 60-69 years. Anti-HCV positivity was most prevalent in the age group of 60-69 years as well. Conclusively, it seems that our region has moderate endemicity for HBV and HCV infections, thus preoperative screening may provide us to detect silent hepatitis patients, but doing anti-HIV test is unnecessary before surgical intervention in our country.

Key words: Hepatitis B, hepatitis C, HIV, prevalence, vaccination.

INTRODUCTION

Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are considered major health problems worldwide. These viruses are associated with chronic

hepatitis, cirrhosis, that may lead to hepatic failure and may progress to hepatocellular carcinoma (HCC) (De Franchis et al., 2003). Chronic hepatitis B (CHB) is a major health burden, with an estimated 400 million people affected globally (Fung et al., 2011). HBV is transmitted through several routes: drug use-related injections; exposure to HBV-positive blood or other body fluids; sexual contact (heterosexual or homosexual); from mother to infant (vertically); and between children in a household (horizontally) (Zhang et al., 2001). The most efficient transmission of HCV is through large or repeated direct percutaneous exposures to blood (for example, transfusion or transplantation from infectious donors, injecting drug use). HCV is less efficiently transmitted by

*Corresponding author. E-mail: ozgurgop@yahoo.com. Tel: +90 356 212 9500-1207. Fax: +90 356 2133179.

Abbreviations: HBV, Hepatitis B virus; HCV, hepatitis C virus; HIV, human immunodeficiency virus; HCC, hepatocellular carcinoma; CHB, chronic hepatitis B; AIDS, acquired immune deficiency syndrome; UNAIDS, united nations programme on HIV/AIDS; HBsAg, hepatitis B surface antigen; CDC, centers for disease control and prevention.

single small dose percutaneous exposures (for example, accidental needlesticks) or by mucosal exposures to blood or serum-derived fluids (for example, birth to an infected mother, sex with an infected partner) (Alter, 2007, 2007). It is estimated that there are more than two billion people infected with HBV and 170 million infected with HCV worldwide (De Franchis et al., 2003). Acquired immune deficiency syndrome (AIDS), which is caused by human immunodeficiency virus (HIV) can become more prevalent if sufficient measures are not taken (MMWR, 1992).

In 2009, there were an estimated 2.6 million (2.3–2.8 million) people who became newly infected with HIV. United Nations Programme on HIV/AIDS (UNAIDS) estimates that there were 33.3 million (31.4–35.3 million) people living with HIV at the end of 2009. Sub-Saharan Africa still bears an inordinate share of the global HIV burden. Although the rate of new HIV infections has decreased, the total number of people living with HIV continues to rise. In 2009, that number reached 22.5 million (20.9–24.2 million), 68% of the global total. Sub-Saharan Africa has more women than men living with HIV

(http://www.unaids.org/documents/20101123_GlobalReport_Chap2_em.pdf).

In Turkey, a total of 4525 HIV positive cases have been reported by state health authorities until December 2010, according to data from Turkish ministry of Health (Turkish Ministry of Health, 1995).

In Turkey most surgeons request the test for hepatitis markers and HIV ELISA to patients who will undergo any surgical intervention although this is not realistic. Thus, in this study, we assessed results of hepatitis B surface antigen (HBsAg), anti-HCV and anti-HIV which were ordered to patients before any surgical intervention in years 2009 and 2010.

The objective of the study was to assess the prevalence of anti-HIV among surgical patients admitted to a tertiary care hospital. In addition, the prevalence of HBsAg and anti-hepatitis C virus (anti-HCV) was determined. It is hoped that data generated in this study will be useful for assessing the rationale for withdraw preoperative HIV testing and for reducing concerns about occupational transmission of HIV.

MATERIALS AND METHODS

All patients who were planned to have surgical intervention and had tests for HBsAg, anti-HCV and anti-HIV in years 2009 and 2010, were included in this retrospective study, and the test results were retrieved by review of hospital records. HBsAg, Anti-HCV, Anti-HIV serologies were determined using an enzyme immunoassay method (Abbott AxSYM). Statistical analysis was carried out by using SPSS version 19 (IBM SPSS Statistics 19, SPSS inc., an IBM Co., Somers, NY). The chi-square test was used to compare the prevalences of HBsAg, anti-HCV, anti-HIV between the genders or age groups. A value of $P < 0.05$ was considered statistically significant.

RESULTS

Of totally 3794 patients included in the study, 1504 (39.6%) were male whereas 2290 (60.3%) were female. The mean age of all patients was 54.13 (range, 4-97) years (standard error was 0,265). HBsAg test result was available from 3782 patients (1498 male, 2283 female). It was found that 128 patients (3.4%) were HBsAg positive, 73 of all HBsAg positive patients were male while 55 were female. When we compared the HBsAg frequencies between the two genders, we found a significant difference; men's risk for HBV infection were found to be 2,07 times higher compared to women [OR=0,482, 95% confidence interval (CI)] (Table 1). When the subjects were divided into groups according to age (≤ 29 , 30-39, 40-49, 50-59, 60-69, 70-79, ≥ 80) there was significant difference of HBsAg positivity among different age groups. It was found that the increase in HBsAg frequency was concordant with increase in age. The highest HBsAg prevalence of 5.2% was seen in the age group 60-69 years, whereas the lowest prevalence of 0.4% was in subjects below age 29 (Table 2). Moreover it was found that the prevalence became higher especially after the age 40.

Among 3736 subjects tested for anti-HCV, 1484 (%39.7) were male and 2251 (%60.3) were female. Eighty five subjects [27 male (1.8%), 58 female (2.6%)] were found to be anti-HCV positive, thus the prevalence was 2.2%. No significant difference of anti-HCV prevalence was found between the two genders ($\chi^2=2,306$, $p=0.129$), although women's risk for HCV infection were 1, 04 times higher compared to men [OR=1,427, (95% CI)] (Table 1). (Please note that the interpretation of odd ratio given by you is really confusing, and the odds ratio should always be accompanied by 95% confidence interval) When the subjects were divided into groups according to age (≤ 29 , 30-39, 40-49, 50-59, 60-69, 70-79, ≥ 80) there was significant difference regarding anti-HCV positivity among different age groups ($\chi^2=33,803$, $p=0,0001$). It was found that anti-HCV frequency increased as the patients got older. The highest anti-HCV prevalence of 4.3% was seen in the age group 60-69 years, whereas the lowest prevalence of 0.4% was in subjects whose age ≤ 29 (Table 2). Nobody was found to be positive for anti-HIV among 3765 patients.

DISCUSSION

HIV, HBV and HCV are of great concern because of their prolonged viremia and carrier or latent state. They also cause fatal, chronic and life-threatening disorders (Tessema et al., 2010). Turkey may be considered a region of moderate endemicity for HBV and HCV. HBV has its highest prevalence in the east and southeast regions of the country (Yıldırım et al., 2009).

Erden et al. (2003) found that the prevalences of

Table 1. Comparison of hepatitis markers according to gender.

	Male	Female	P value	Chi-square
HBsAg	73(n = 1498)	55(n =2283)	0.0001	16.791
Anti-HCV	27(n = 1484)	58(n = 2251)	0.129	2.306

Table 2. Comparison of hepatitis marker positivity in study subjects according to age distribution.

Age distribution	HBsAg (n:3782)	(%)	Anti-HCV (n:3736)	(%)
≤29	1 (n:277)	0.4	1(n:274)	0.4
30-39	7(n:508)	1.4	5(n:506)	1
40-49	25(n:696)	3.6	6(n:688)	0.9
50-59	35(n:828)	4.2	16(n:809)	2
60-69	40(n:773)	5.2	33(n:763)	4.3
70-79	16(n:463)	3.5	17(n:459)	3.7
≥80	4(n:237)	1.7	7(n:237)	3
Total	128	3.4	85	2.3
p value		0.0001		0.0001
Chi-square		25.558		33.803

HBsAg, anti-HBs, and anti-HCV were 6.6%, 28.1%, and 2.4%, respectively, in 1,157 randomly selected patients attending the outpatient clinic. In a meta-analysis from Turkey, it was clarified that the prevalence of HBsAg is lower than 5.2% in blood donors and from 1.7 to 21% in the community (Ozdemir and Kurt, 2007). In addition, the prevalence of HCV was declared lower than 1.6% in blood donors and from 1.2 to 2.6% in the community (Sunbul, 2007).

Yıldırım et al. (2009) found that the prevalences of HBsAg, anti-HBs, anti-HBc IgG (isolated) and anti-HCV were detected in 60 (5.5%), 250 (22.8%), 132 (12.1%), and 23 (2.1%) individuals of the 1,095 study participants, respectively, in the province of Tokat. In the present study we found that 128 of all patients (3.4%) were HBsAg positive while 85 (2.2%) were anti-HCV positive. HBsAg positivity was lower than that reported by Yıldırım et al. (2009) but anti-HCV positivity was comparable. The difference in HBsAg prevalence rates might be resulted from different study populations or dates of studies, of which one conducted by Yıldırım et al. was 4 years earlier. In a study of Dundar et al. (2000) which was carried out in Samsun, a province located in the black sea region of Turkey, HBsAg positivity was found to be 3.1% which was consistent with our finding. While there was no difference of HBsAg positivity between genders according to the study of Yıldırım et al. (2009) we found significant difference in the present study and also found that men had 2.07 times greater risk for HBV infection than women.

Additionally, we found that HCV infection was more prevalent in women than men, similar to the findings of Yıldırım et al. (2009) and, also that women had 1.04 times greater risk for HCV infection than men but this was

not to be statistically significant. We found that anti-HCV-positivity in the age group of 60 to 69 was significantly higher than in the age groups of ≤29, 30-39, 40-49, 50-59, 70-79, ≥80. Similarly, we found that HBsAg-positivity in the age group of 60 to 69 was higher than others.

In the present study, it was determined that anti-HCV was most prevalent in the age group of 60 to 69 whereas HBsAg prevalence became more prevalent especially after 40 years old. In a study from southeastern region of Anatolia, the highest anti-HCV prevalence was determined in the age group of 35-44 (Dursun et al., 2004). However, in a study carried out in the same region with our study, Yıldırım et al. (2009) reported that anti-HCV prevalence was lower in patients under 50 years old, which is consistent with our finding. We determined that both HbsAg and anti-HCV prevalences were lowest in individuals ≤29 years old.

In Turkey, safe and effective vaccines have been available since the early 1990s, and a nationwide HBV vaccination program (NHVP) has been implemented since 1998 (Ozer et al., 2001).

According to our findings, we suggest that nationwide HBV vaccination program which has been applied within last 12 years, has been successful and people in Turkey have obeyed the hygienic rules more.

In the study conducted in Iran by Kafi-abad et al. (2009), they showed that in general population the prevalence of HBV was 0.56% and the prevalence of HBV which was 0.73% in 2004 declined to 0.41% in 2007. In a recent seroprevalence study in 371 children whose ages were among 0-15, we showed that the HBsAg and anti-HCV positivity were determined in neither of the cases (Gunal et al. 2010).

In a study done by Kangin et al. (2010) in Southeastern

Anatolian Region, they investigated the seroprevalence of HBV on the children whose ages were among 0-14 between the years 2005-2008 after a nationwide HBV vaccination program (NHVP). In this study, while the prevalence of HBsAg was determined as 8.1%, it was especially high in male children and among the ages 7-12 years. In the same study, the positivity of anti-HBs and/or anti-HBc were determined as 56.9% and it was also determined that this rate gradually increased over the years especially among the vaccinated children. Conclusively, they emphasized the effectiveness of NHVP and also the necessity of the additional measurements which must be taken for the infection behind screening the serology of HBV in all pregnant.

AIDS is still importantly a life threatening disease in Africa and Asia where the economic, socioeconomic and cultural levels are low (<http://www.unaids.org/en/KnowledgeCentre/HIVData/EpiUpdate/EpiUpdArchive/2009/default.asp>). UNAIDS reported that there are 33.4 million people living with HIV/AIDS (PLWHA) worldwide, and 4.9 million HIV-positive individuals were alive in Asia in 2009, about the same as five years earlier (http://www.unaids.org/documents/20101123_GlobalReport_Chap2_em.pdf). There is an enormous difference in the national HIV prevalence among Asian countries. Specifically, South and Southeast Asia have a high prevalence (Lee et al., 2010).

The first HIV/AIDS cases had been reported in 1985 from Turkey and with an increasing trend during the following years, the number of cases reached to 3898 with 528 new cases in 2009 (Alp et al., 2011).

The US Centers for Disease Control and Prevention (CDC) recommend HIV screening in healthcare settings for persons aged 13–64 years as part of routine medical care, irrespective of lifestyle, perceived risk, or local prevalence of HIV (Branson et al., 2006).

Separate informed consent for HIV testing is no longer required, and counseling is not offered. The new guidelines further state that healthcare providers should continue to initiate screening until the prevalence of undiagnosed HIV infection in the patient population has reached less than 0.1% (Gańczak and Szych 2009).

In our country, the prevalence of HIV in blood donors changes between 0-0.86% (<http://www.saglik.gov.tr/TR/belge/1-1955/temel-saglik-hizmetleri-genel-mudurlugu.html>). In the current study, HIV positivity was not determined in none of the 3765 patients. Consistently, in a study done by Girgin et al. (2009) among patients before surgery, positivity of anti-HIV was determined neither in control nor in patient groups.

Conclusion

Our study and also other studies conducted at general population in our region of Turkey may indicate our

region has moderate endemicity for HBV and HCV infections. We suggest preoperative screening of HBV and HCV may provide the opportunity to detect silent hepatitis patients. Besides, as similar studies have similar findings it seems unnecessary to seek anti-HIV on the patients who do not have risk factors before the operation in our country. We also suggest that a national consensus report must be established in this subject.

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