

Seroprevalence of HBsAg, Anti-HCV and HIV in patients undergoing ocular surgery

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Abstract

Aim: In this study, we aimed to detect the seroprevalence of hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) in patients undergoing ocular surgery.

Materials and Methods: HBsAg, anti-HCV, and HIV test results of patients who were admitted to the Department of Ophthalmology of the Karabuk University Training and Research Hospital between March 2016 and April 2019 were retrospectively reviewed. HBsAg (Abbott Diagnostics, USA), anti-HCV (Abbott Diagnostics, USA) and HIV Ag/Ab Combo tests (Abbott Diagnostics, USA) were assessed by chemiluminescence microparticle enzyme immunoassay method by using Abbott Diagnostic kits and ARCHITECT i2000 SR (Abbott Diagnostics, USA) immunoassay analyzer. Patients were divided into four groups according to age: 20–39, 40–59, 60–79, and 80 years old and above. Seropositive patients were evaluated in terms of the surgical method applied.

Results: Of 1504 patients included in the study, 768 (51%) were men and 736 (49%) were women, and the mean age was 70 years. HBsAg positivity was 0.79% (12/1504) and anti-HCV positivity was 2.06% (31/1504). HIV Ag/Ab Combo was negative in all patients. There were no HBsAg and anti-HCV-positive patients in the 20–39 years age group, whereas one HBsAg (0.06%) and two anti-HCV (0.13%) positivity in the 40–59 years age group and 11 HBsAg (0.73%) and 23 anti-HCV (1.52%) positivity in the 60–79 years age group were detected. Although HBsAg was negative in all patients over 80 years old, anti-HCV was positive in 6 (0.39%) patients. Further, eight of 12 HBsAg-positive patients underwent cataracts surgery and four lacrimal canal surgery, and 24 of 31 anti-HCV-positive patients underwent cataracts surgery, five lacrimal canal surgery, and two eyelid surgery.

Conclusion: All patients should be tested for HBsAg, anti-HCV, and HIV preoperatively. Seropositive patients should be informed about viral hepatitis and should be referred to the infectious diseases department. Necessary precautions should be taken to prevent contamination to healthcare professionals and other patients during operation and medical care.

Keywords: Anti-HCV; HBsAg; HIV; ocular surgery

INTRODUCTION

Viral hepatitis is an important life-threatening infection leading to serious health problems including liver cirrhosis and hepatocellular carcinoma. According to the 2017 World Health Organization report, it is estimated that 252 million people are infected with hepatitis B virus (HBV), 71 million are infected with hepatitis C virus (HCV), and 36.7 million people carry human immunodeficiency virus (HIV) (1,2). Turkey is in a middle-endemic region (2%–8%) for HBV, and the general population prevalence of HBV and HCV is 2.3% and 1.6%, respectively (3,4).

In addition to contact with tears and aqueous humor, ophthalmologists also have a risk of blood-borne infection due to accidental needle-stick injury during peribulbar anesthesia or surgery (5,6). Seropositive asymptomatic

carriers serve as reservoirs of infection for the population and can cause transmission of the disease to other people unless routine screening tests are performed prior to surgery (7,8). In studies conducted among patients applying for ocular surgery, the prevalence of HBV, HCV, and HIV has been reported between 1%–4%, 0.5%–6%, and 0.3%–0.5%, respectively (9–11). Screening of HBV, HCV, and HIV in patients who are planning to undergo ocular surgery is important both for self-protection of medical staff in terms of transmission and to provide diagnosis and treatment of these individuals, most of whom are asymptomatic.

In this study, we aimed to determine the frequency of HBV, HCV, and HIV infections in patients undergoing ocular surgery.

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MATERIALS and METHODS

HBsAg, anti-HCV, and anti-HIV results of the patients who were admitted to the Department of Ophthalmology of the Karabuk University Training and Research Hospital and had undergone ocular surgery between March 2016 and April 2019 were included in this cross-sectional study. Results of the patients with recurrent disease were excluded from the study. HBsAg (Abbott Diagnostics, USA), Anti-HCV (Abbott Diagnostics, USA) and HIV Ag/Ab Combo test (Abbott Diagnostics, USA) were assessed by chemiluminescence method with an ARCHITECT i2000 SR (Abbott Diagnostics, USA) device. Patients were divided into four groups according to age: 20–39, 40–59, 60–79, and 80 years old and above. HBsAg, Anti-HCV, and anti-HIV results were retrospectively reviewed. Seropositive patients were evaluated in terms of the surgical method applied.

Statistical Analysis

Minitab 17 statistics program was used for statistical analysis of the data. Descriptive statistics were expressed as number (n), percentage (%), median, minimum and maximum values. Anderson Darling test was used as a normality test. Pearson chi-square test was used in the analysis of categorical variables. P-value ≤ 0.05 was considered statistically significant. This study was approved by the Karabuk University Non-Interventional Clinical Research Ethical Committee (77192459-050.99-E.5453).

RESULTS

Of 1504 patients included in the study, 768 (51.1%) were male and 736 (48.9%) were female, with a mean age of 70 (range 20–93) years. The distribution of patients by age groups is shown in Table 1. Further, 1.9%, 14.6%, 66.7%, and 16.8% of patients were in the age range of 20–39, 40–59, 60–79, and 80 years and above, respectively. There was no significant difference between age groups ($P = 0.726$). HBsAg positivity was 0.79% (12/1504), and anti-HCV positivity was 2.06% (31/1504). No patient had HBV and HCV co-infection. Moreover, all patients were tested seronegative for HIV.

Age	HBsAg (n=1504)	Anti HCV (n=1504)	Anti HIV (n=1504)	P
20-39	29/0	29/0	29/0	0.726
40-59	219/1 (0.06%)	219/2 (0.13%)	219/0	
60-79	1003/11 (0.73%)	1003/23 (1.52%)	1003/0	
80 +	253/0	253/6 (0.39%)	253/0	
	1504/12 (0.79%)	1504/31 (2.06%)	1504/0	

Evaluation of the distribution of seropositive patients according to age groups revealed that there were no HBsAg and anti-HCV-positive patients in the 20-39 years age group. In the 40–59 years age group, one

HBsAg (0.06%) and two anti-HCV (0.13%) positivity were detected, and in the 60–79 years age group, 11 HBsAg (0.73%) and 23 anti-HCV (1.52%) positivity were detected. Although HBsAg was negative in all patients over 80 years old, anti-HCV was positive in six (0.39%) patients

(Table 1). Furthermore, eight of the 12 HBsAg-positive patients (seven male, five female) underwent cataracts surgery and four lacrimal canal surgery, and 24 of the 31 anti-HCV-positive patients (18, male, 13 female) underwent cataracts surgery, 5 (0.33%) lacrimal canal surgery, and two (0.13%) eyelid surgery (Table 2).

Ocular surgery type	HBsAg (+) (n=12)	Anti HCV (+) (n=31)
Cataracts surgery	8	24
Lacrimal canal surgery	4	5
Eyelid surgery	-	2

DISCUSSION

Viral hepatitis is a global public health problem today. The most common causes of chronic liver diseases and hepatocellular cancer are chronic hepatitis B and chronic hepatitis C infections worldwide (12). Healthcare professionals are at risk for blood-borne pathogens, including HBV, HCV, and HIV. Infection with these viruses occurs through exposure to blood and blood products or contaminated sharp instruments or by mucocutaneous contact (13). According to WHO and Centers for Disease Control and Prevention (USA), more than 85 million health workers worldwide have been injured via contaminated medical devices (14).

Turkey is in a middle-endemic region for HBV infections. HBV seroprevalence varies between regions, and it is quite variable according to the demographic structure of the study group. Although HBsAg positivity of the general population in Turkey was reported 1.6%–0.5% (15–17), this rate was determined as 2.3%–5.7% for Syrian refugees (18–20). Conversely, these rates were higher in some groups that have frequent blood and blood product transfusions or are exposed to continuous invasive procedures such as hemodialysis (21,22).

In previous studies, the frequency of HBV has been reported between 1%–4% and that of HCV between 0.5%–6% in patients who underwent ocular surgery (9–11). Ambastha et al. from India (10) have found that 560 patients who underwent ocular surgery were 3.9%, 0.53%, and 0.35% positive for HBsAg, anti-HCV, and anti-HIV, respectively. Nangrojo et al. (23) from Pakistan have reported 4.3% positivity for HBsAg in 437 patients and have detected anti-HCV seropositivity as high as 20.3%. Tahir et al. (9) from Pakistan have reported Hbs Ag and AntiHCV reported seropositivity as 2.6% and 6.2% in 648 patients who underwent cataract surgery. In this study, in 1504 patients who underwent ocular surgery, HBsAg

positivity was 0.79% and anti-HCV positivity was 2.06%. The rates in our patient groups were lower than those in other studies. This may be because these studies belong to low-income countries.

In this study, the positivity of HBsAg and anti-HCV were most frequently detected in the 60–79 years age group. This may be related to the facts that the majority of our patients had developed cataract over the age of 60 and hepatitis B vaccination is not common in this age group and that the risk of HCV is relatively high in people over 50 years of age. Indeed, Tozun et al. (24) have reported that HCV seroprevalence was between 0.4% and 1.5% in various age groups in a multicenter TURHEP study involving 5640 individuals and that being over 50 years old was the only significant predictor for anti-HCV seropositivity. In a study involving 1130 patients undergoing cataracts surgery, Ahmad et al. reported that anti-HCV positivity was most frequently found in the 55–64 years age group (25), whereas Naem et al. (26) reported that this age range was 50–85 years. In India, Ambasta et al. (10) found that HBsAg positivity was most frequently found ranging from 40–70 years and anti-HCV positivity in the 40–60 years age group.

In this study, both HBsAg and anti-HCV seropositivity were found to be higher in men. Furthermore, seven HBsAg-positive patients were male and five were female, whereas 18 HCV-positive patients were male and 13 were female. In other studies conducted in ocular surgery patients, HBsAg and anti-HCV seropositivity were not found to be associated with gender (10,23,9). Tozun et al. (24) have reported that the male gender is a significant predictor for HBsAg seropositivity. This has been associated with the fact that circumcision of boys used to be performed by non-medical personnel and in low hygienic settings.

During ocular surgery, ophthalmologists are exposed to viral pathogens via lacrimal and aqueous humor contact apart from percutaneous exposure. The risk of transmission is 6%–30% for HBV, 1.8% for HCV, and 0.3% for HIV after percutaneous exposure (27). Hepatitis B is the viral agent most likely to be transmitted following percutaneous injury (28). In 1992, the World Health Organization had considered HBV infection as an occupational disease for healthcare professionals. (29) For preventing HBV infections, taking precautions against known transmission routes, active and passive immunization, and training programs are important. Today, the hepatitis B vaccine is recommended for all age groups. In some studies, the presence of HBV, HCV, and HIV has also been detected in the aqueous humor (30–32). Temel et al. (30) have detected HBV in 70% patients with hepatitis B by using polymerase chain reaction in the aqueous humor and tears, and this rate was 85% in a study by Koksall et al. (33). Atas et al. (31) have reported the presence of HCV RNA in the aqueous humor and tears of HCV patients. Han et al. (34) have found the presence of HIV in the tears of HIV patients under intensive therapy.

In HBV, HCV, or HIV-positive patients whom underwent operation, the surgeon, operating room staff, healthcare professionals responsible for the patient's medical care, and other patients are at a risk of infection. Therefore, all patients should be screened for HBV, HCV, and HIV in preoperatively. Precautions include changing the tubing set used in eye surgeries for each patient, taking asymptomatic carriers as the last case, cleaning the surfaces after operation with appropriate disinfectants, disposing of single-use instruments, and delivering the infected surgical materials to the sterilization unit in a separate bag with a warning that they are infected.

LIMITATIONS

This study has some limitations. It is a single-center retrospective study based on laboratory data. Thus, we have no data concerning risk factors.

CONCLUSION

All patients should undergo HBsAg, anti-HCV, and anti-HIV tests preoperatively. Seropositive patients should be informed about their disease and directed to the department of infectious diseases. Protective measures should be taken to prevent transmission from these patients to healthcare professionals and other patients.

Competing Interests: The authors declare that they have no competing interest.

Financial Disclosure: There are no financial supports.

Ethical Approval: This study was approved by the Karabuk University Non-Interventional Clinical Research Ethical Committee (77192459-050.99-E.5453).

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