ÖZGÜN ARAŞTIRMA / ORIGINAL RESEARCH

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Assessment of hepatitis B, hepatitis C and human immunodeficiency virus screening results performed before elective eye surgery

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Abstract

Assessment of hepatitis B, hepatitis C and human immunodeficiency virus screening results performed before elective eye surgery

Objective: Although preoperative screening for Hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) infections in patients is a controversial issue in terms of cost-effectiveness and patient privacy, this practice is commonly carried on by surgical branches. The goals of this study were to evaluate the prevalence of preoperative HBV surface antigen (HBsAg), anti-HCV and anti-HIV antibodies, as well as whether seropositive patients were referred to the infectious diseases outpatient clinic.
Method: In this study, blood samples from 884 patients who underwent elective eye surgery at Tokat Gaziosmanpaşa University Medical Faculty Hospital between August 2019 and April 2021 were researched for HBsAg, anti-HCV and anti-HIV positivity and seroprevalences were determined. It was also determined whether patients with seropositivity from the hospital automation system had previously been diagnosed and if newly diagnosed patients applied to the infectious diseases outpatient clinic in the subsequent period.
Results: The study comprised a total of 884 patients. Males comprised 457 (51.7%) of all patients, with a mean age of 63.21± 16.05. In 29/839 (3.3%) of the patients, HBsAg was positive. Anti-HCV positivity was found in 21/872 (2.4%) people. Anti-HIV positivity was not detected in any of the patients.
Conclusion: It would be a more accurate and effective approach to increase compliance with standard hygiene and protection measures rather than requesting routine pre-operative testing for HBV, HCV and HIV. If these tests reveal seropositivity, the patient should be informed of the disease and referred to an infectious disease specialist.
Keywords: Hepatitis B Virus, Hepatitis C Virus, Human Immunodeficiency Virus, Preoperative, Elective Surgical Procedures

Öz

Elektif göz cerrahisi öncesi hepatit B, hepatit C ve insan immün yetmezlik virüsü tarama sonuçlarının değerlendirilmesi

Amaç: Operasyon öncesi hastaların hepatit B virüsü (HBV), hepatit C virüsü (HCV) ve insan immün yetmezlik virüsü (HIV) ile enfeksiyon varlığı açısından taranması, maliyet-etkinlik ve hasta mahremiyeti açısından tartışmalı bir konu olmakla birlikte, cerrahi branşlar tarafından çoğunlukla bu uygulanmaya devam edilmektedir. Bu çalışmanın amacı, preoperatif HBV yüzey antijeni (HbsAg), anti-HCV ve anti-HIV pozitiflik oranını belirlemek ve seropozitif hastaların enfeksiyon hastalıkları polikliniğine yönlendirilip yönlendirilmediğini belirlemektir.
Yöntem: Ağustos 2019 -Nisan 2021 arasında, Tokat Gaziosmanpaşa Üniversitesi, Tıp Fakültesi, Göz kliniğinde elektif cerrahi yapılan hastaların operasyon öncesi istenen HbsAg, anti-HCV ve anti-HIV sonuçları, hastane otomasyon sistemi kayıtları kullanılarak geriye dönük tarandı ve seroprevalans belirlendi. Ayrıca hastane otomasyon sisteminden seropozitivite saptananların daha önce tanı alıp almadıkları ve yeni tanı alanların sonraki dönemde enfeksiyon hastalıkları polikliniğine başvurup başvurmadıkları araştırıldı.
Bulgular: Çalışmaya 884 hasta dahil edildi. Hastaların 457' si (%51.7) erkek olup yaş ortalaması 63.21± 16.05 idi. Hbs Ag tetkiki hastaların 839'unda (%94.9) çalışıldı ve 29 hastada (%3.3) pozitiflik saptandı. Anti-HCV tetkiki 872 (%99.1) kişide çalışıldı ve 21 kişide (%2.4) pozitiflik saptandı. Anti-HIV testi ise 862 (%97.5) kişide çalışıldı ve hiçbir hastada pozitiflik tespit edilmedi.
Sonuç: Ameliyat öncesi hastaları HBV, HCV ve HIV enfeksiyonları açısından tetkik etmek yerine standart hijyen ve korunma önlemlerine uymaları daha doğru ve etkili bir yaklaşımdır. Eğer bu testler çalışılmış ve seropozitiflik saptanmışsa hasta mutlaka hastalığı konusunda bilgilendirilmeli ve enfeksiyon hastalıkları uzmanına yönlendirilmelidir.
Anahtar Kelimeler: Hepatit B Virüsü, Hepatit C Virüsü, İnsan İmmün Yetmezlik Virüsü, Preoperatif, Elektif Cerrahi İşlemler

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INTRODUCTION

Hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) cause infections that are transmitted directly or indirectly by blood, blood products, and body fluids. According to World Health Organization (WHO) data, the global HBV prevalence is 3.5%. An average of 240 million people infected with HBV (1). It is known that Turkey has a 4.6% Hepatitis B virus surface antigen (HBsAg) positivity rate, and approximately 3.3 million people are chronically infected with HBV (2). The global HCV prevalence ranges from 0.5% to 2.3%. It is estimated that approximately 130-150 million people worldwide were infected with HCV, with 1.5 million new HCV infections occurred in 2019 (1). The prevalence of HCV infection in Turkey is between 0.5% and 0.96% (3,4). The global prevalence of HIV ranges from 0.4% to 3.1%. Approximately 37.6 million people are living with HIV infection (5). In our country, 20,202 peoples living with HIV and 1,786 patients with Acquired Immune Deficiency Syndrome (AIDS) were reported up until June 30, 2019 (6).

Viral hepatitis is a serious public health problem that affects countries around the world and has a negative impact on their economies. Viral hepatitis can cause morbidity and death by causing acute and chronic viral hepatitis, cirrhosis, liver failure and liver cancer. In Turkey, the most common causes of chronic liver diseases are HBV and HCV infections (1). As a result of the body's immune system being weakened during HIV infection, severe infections and cancers may occur (6). In addition, the stigmatization and discrimination against HIV-positive people in society pose a separate threat to their emotional and mental health (7).

Local anesthesia is used most commonly for eye surgery. Sub-Tenon's nerve block and single-shot peribulbar nerve blocks are the most common techniques for ophthalmic regional anesthesia. During the application of local anesthesia, the injector might be inserted into the doctor's hand, inadvertently (8). The rate of needle stick injuries among ophthalmologists is estimated to be 0.07/1000 surgeries (9). Horizontal transmission of HBV, HCV and HIV infections is possible (10). However, there is only evidence of horizontal transmission in experimental sequential phacoemulsification among eye surgeries (11).

Preoperative screening of patients for HBV, HCV and HIV infections is still a controversial issue in terms of cost-effectiveness and patient rights. However, these screening tests are still requested in many surgical departments. Although screening tests have been performed, it is still unclear how the patient is informed of the test results, and how well the surgeon can guide the patient with a positive test result. The purpose of this study was to see if patients who tested positive for HBsAg, anti-HCV and/or anti-HIV in tests performed before elective eye surgery were informed of their results, if these people were aware of their disease, if they were followed up on a regular basis in the infectious diseases outpatient clinic, and if they received the intended antiviral treatment.

METHOD

The study was designed as a retrospective descriptive study. In this study, blood samples from 884 patients who underwent elective eye surgery at Tokat Gaziosmanpaşa University Medical Faculty Hospital between August 2019 and April 2021 were tested for HBsAg, anti-HCV and anti-HIV using the Enzyme-Linked Immunosorbent Assay (ELISA) method. The cut-off values for HBsAg, anti-HCV and anti-HIV were 1.0, 0.9 and 0.9, respectively. For all parameters, the results are presented as a cut-off index (COI).

Seroprevalence was calculated by determining the number of seropositivity samples. It was explored whether patients with seropositivity had previously been diagnosed, and if not, whether they later applied to infectious diseases outpatient clinics. The hospital automation system was used to obtain the patients' demographic, epidemiological, and laboratory data.

Patients under the age of 18 and patients whose preoperative examination was not performed because they were operated under emergency conditions were not included in the study.

Statistical Analysis

The data was calculated using the Statistical Package for Social Sciences version 22 (SPSS Inc., Chicago, Illinois, USA) statistical software platform. The conformity of the variables to the normal distribution was examined using visual (histograms and probability graphs) and analytical methods (Kolmogorov-Smirnov/Shapiro-Wilk tests). Descriptive statistics for categorical variables were given as numbers and percentages, mean ± standard deviation for normally distributed continuous variables, and median (minimum-maximum) for non-normally distributed continuous variables.

RESULTS

A total of 884 patients were included in the study. Of them 457 (51.7%) were male, with an average age of 63.21± 16.05. Of the 884 patients included in the study, 839 (94.9%) were tested for HBsAg, 872 (99.1%) were tested for anti-HCV and 862 (97.5%) were tested for anti-HIV, HBsAg and anti-HCV seropositivity rates were 3.3% (n=29), and 2.4%(n=21), respectively. Anti-HIV seropositivity was not detected in any of the patients.

Seventeen (58.6%) of the HBsAg positive patients were male, with a mean age of 63.72± 10.56. Thirteen (44.8%) of the HBsAg positive patients were followed in the infectious

diseases and/or gastroenterology outpatient clinic. It was determined that the remaining 16 (55.2%) patients were not followed up on, and no further testing for HBV infection was requested.

Four (19%) of the anti-HCV positive patients were male, with a mean age of 69.85± 13.32. Nine (42.9%) of these patients went to the infectious diseases outpatient clinic and were tested for HCV-RNA. One of them (11.1%) tested positive for HCV RNA and was treated with direct acting antivirals (DAA). The HCV RNA results of the other eight (88.9%) patients were negative.

DISCUSSION

The majority of surgeons in our country request HBsAg, anti-HCV, and anti-HIV tests before surgery. In various studies, the risk of percutaneous contact during surgeries has been reported to range between 0.1% and 15% (12,13). There are many studies in the literature that evaluate the results of screening for HBV, HCV, and HIV infections prior to surgery. The most of these studies aim to determine the prevalence and highlight the fact that surgeons are at risk for blood-borne infections. On the other hand, the importance of informing the patients who had positivity of anti-HIV, or HBsAg, or anti-HCV tests and directing them to the infectious diseases outpatient clinic were emphasized in this study.

In May 2016, WHO established a global health sector strategy on viral hepatitis for the years 2016-2021. The global health sector strategy aims to eliminate viral hepatitis as a public health risk by 2030, with a 90% reduction in the risk of new infections, an 80% reduction in the number of curable hepatitis patients, and a 65% reduction in hepatitis-related mortality (1). Three goals are set for 2030, in accordance with The Joint United Nations Programme on HIV/AIDS (UNAIDS)'s 90-90-90 global HIV targets for the end of the AIDS epidemic, which has caused the death of approximately 40 million people: a) identification of 90% of HIV-infected people, b) antiretroviral therapy (ART) for 90% of these diagnosed people, and c) viral suppression for 90% of them with ART. If these three goals are met, it is expected that the current viral suppression will increase 2-3 times, the epidemic will end in 2030, and the significant burden it imposes on public health and economy will be eliminated (14).

As a result of different samples taken in our country, the frequency of HBsAg was found to be between 0.8 and 5.7%, putting Turkey in the middle endemic region (15). HBV seroprevalence ranged between 1.29% and 5.5% in Tokat surveys (16,18). In our country, the prevalence of HCV infection ranges from 0.6% to 2.1% (18,19). In city of Tokat, the prevalence of HCV infection ranges between 0.16% and 2.2% (16-18). According to the data from the Ministry of Health in our country, HIV prevalence appears to be very low. Anti-HIV seroprevalence was less than 0.01%. In Turkey, a total of 20,202 peoples living with HIV and 1,786 peoples with AIDS were reported up to June 30, 2019 (6). The number of reported cases is thought to be significantly lower than the actual number of cases (20). On the other hand, in some seroprevalence studies conducted in our country, anti-HIV positivity was found to be very low (21,22). In the seroprevalence studies in Tokat, no HIV positive individuals were found (16,18). In our study, seropositivity rates of HBsAg, anti-HCV, and anti-HIV were 3.3%, 2.4% and 0%, respectively. Although our findings are similar to the literature, it is worth noting that the prevalence of HCV in Tokat that the prevalence of HCV in Tokat has increased in recent years.

Only 10% of people infected with HBV worldwide have been diagnosed, and only 22% of them are receiving antiviral treatment. In 2019, 30.4 million people living with HBV infection are aware of their disease (23). In a Turkish study, it was determined that only 12% of people infected with HBV were aware of their hepatitis B status (3). This is important in terms of demonstrating that the awareness is extremely low. In our study, we noticed that more than half (55.2%) of patients who tested positive for HBsAg had not been followed up in infectious diseases polyclinics. However, since the study is retrospective, it is difficult to say if the person was previously aware of the disease.

According to WHO data, 21% of the people infected with HCV have been diagnosed, and 62% of them have been treated with antivirals. Still today, 15.2 million people living with HCV infection are aware of their illness (23). In a study from Turkey, it was determined that 26.9% of patients who tested positive for anti HCV antibodies during preoperative screening were unaware of their disease (24). HCV RNA, an advanced test for the diagnosis of HCV infection, was not tested in 47.1% of the patients in this study. This test can only be requested from our hospital's infectious diseases and gastroenterology departments. Therefore, it is understood that these patients did not apply to any of these polyclinics. Since this study was retrospective, no data on past diagnosis or follow-up at another hospital is available.

In 2019, 81% of people living with HIV were aware of their HIV status, and 82% [66–97%] of them were receiving treatment. Moreover, 88% of patients under treatment had suppressed viral loads (23). Turkey is among the countries has been unable to establish a HIV diagnosis and treatment cascade, since the actual number of HIV cases has not been estimated using accurate tools, and there is no national database covering all diagnosed cases (20). Only data on the rates of ART start in patients enrolled in Turkey's health-care system for the years 2011 and 2012 were acquired from the HIV-TR cohort. The rate of ART initiation in patients who applied to the centers during this time period was 76.6% (25).

According to two studies, the rate of cases receiving ART for more than six months and achieving virological suppression ranged from 76.6% to 90%, depending on the years (25,26).

In a study of 479 ophthalmologists, 22% of physicians were found to have sustained injuries with needles or sharp instruments. It was observed that 60% of the physicians participating in the same study performed tests for blood-transmissible viral infections prior to the operation, 20% screened high-risk patients, and 18% did not (27). In this study, a total of 839 (94.9%) patients were tested for HBsAg, 872 (99.1%) were tested for anti-HCV, and 862 (97.5%) were tested for anti-HIV. During the preoperative period, all patients had at least one ELISA test. This may be due to the fact that all three tests were not requested for all patients, the patient already had a known infection diagnosis, or a missing request was made during the test request. Since our study was retrospective, a clear interpretation cannot be made on this subject.

There are few studies in the literature evaluating the results of ELISA scans for HBV, HCV, and HIV infections performed before eye surgery. Cubuk et al. found that 3.8% of patients who applied for cataract surgery in Adana were HBsAg positive and 1.3% were anti-HCV positive in their study with patients who applied for cataract surgery. In the same study, no anti-HIV positivity was detected (8). In a study among senile cataract patients in India, the prevalence for HBV, HCV, and HIV was 1.8%, 4.0%, 0.1%, respectively (28). In a 2013 study at a university hospital in Pakistan, the seroprevalence of HBV was 2.62% and the seroprevalence of HCV was 6.17% in patients undergoing cataract surgery (29). In the study of Dahab et al. with patients who applied for elective eye surgery in Cairo between 2015 and 2016, it was found 0.2% of the patients to be HBV positive and 12.4% to be HCV positive (30).

In the literature, there are studies evaluating ELISA scan results before the operation in surgical fields other than eye surgery. In an Istanbul study, HBsAg positivity was found as 3.6%, anti-HCV positivity 0.3%, and anti-HIV positivity 0.2% in screening prior to septoplasty operation (31). Girgin et al. discovered HBsAg, anti-HCV, and anti-HIV seroprevalences to be 6.6%, 1.6%, and 0% among patients in the general surgery clinic, preoperatively (32). In the study of Denk et al., conducted in Elazig, before coronary angiography, 3.71% of the patients had HBsAg seropositivity, 1.57% had anti-HCV seropositivity, and only one (0.03%) male patient had anti-HIV seropositivity (33).

In the guide published by European Association of the Study of Liver Disease (EASL) in 2018, it is recommended that screening strategies for HCV infection be developed using local epidemiological data and national plans, and routine screening can be done in areas with medium and high prevalence (≥2%) of HCV infection (34). Since Turkey is a medium endemic region for HCV infection, it is obvious that routine anti-HCV testing prior to surgery is clearly unnecessary (18,19). According to the Hepatitis Working Group Consensus Report, it would be more acceptable in Turkey to perform anti-HCV screening only in people at risk for the disease, and that preoperative screening is unnecessary (35). In the Hepatitis B Consensus Report of the same group, it is recommended that hepatitis B screening be undertaken frequently in Turkey throughout the premarital period, in pregnant women, and in at risk individuals (15). HIV testing should be voluntary, informed prior to the test, and written or verbal consent should be obtained after the test. Mandatory testing is not recommended by WHO. All HIV diagnostic tests must be implemented without compromising the WHO -5C rules. These rules are; consent, confidentiality, correct test result, connection and counselling (6). Universal infectious disease control precautions emphasize treating all blood and body materials as if they belonged to an HBV, HCV or HIV positive person. These universal precautions are protective barriers such as gloves, gown, mask, and protective eyewear (36).

Lack of knowledge of healthcare professionals about viral hepatitis and HIV may also be the reason for unnecessary preoperative ELISA screening. In a study from Cameroon, approximately one-third of healthcare workers did not have sufficient knowledge about the HBV transmission route, and the rate of stigma against patients was high (37). In a study involving 335 healthcare professionals, a correlation was found between the level of knowledge of healthcare professionals and their positive attitude towards patients with HCV infection (38). Similarly, in a study evaluating the level of knowledges and prejudices of healthcare professionals about HIV in our country, it was found that as the level of knowledge increases, the level of prejudice decreases (39).

The biggest limitation of our study is that it was retrospective and did not have a control group. The reason why there were no HIV-positive individuals in the study can be explained by the low prevalence in the community, and it can also be associated with the low number of patients. To determine the actual HIV prevalence in the province, a seroprevalence study can be conducted in a population that includes a larger patient population and accepts HIV testing. On the other hand, although the number of patients is not very high, the prevalence of hepatitis is consistent with country data and studies conducted in the same province in previous years.

CONCLUSION

As a conclusion, it is not recommended to screen for blood-borne diseases in the preoperative period. Surgeons should treat each patient as if they have a contagious disease and follow standard precautions to avoid these infections. Research and development activities on viral hepatitis and HIV infections are increasing on a daily basis, giving patients the opportunity to choose new and more effective treatment alternatives. The economic burden of viral hepatitis-caused liver cancer and cirrhosis can be considerably decreased with effective treatment. With early diagnosis and treatment, people living with HIV can have the same life expectancy as healthy people. Therefore, as long as surgeons continue to screen for these infections, in addition to protecting themselves, they should guide seropositive individuals about the disease. People who are diagnosed with the disease as a result of the examinations should be referred to the relevant specialist physician, and the available treatment options should be explained.

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Both externally and internally peer reviewed.

Conflict of Interest

The authors declare that they have no conflict of interests regarding content of this article.

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Ethical Declaration

Ethical approval was obtained from the Gaziosmanpaşa University, Medical Faculty Clinical / Human Research Ethics Committee with date 01.07.2021 and number 2021/11, and Helsinki Declaration rules were followed to conduct this study.

Authorship Contributions

Concept: ETY, Design: ŞGK, Supervising: ETY, Financing and equipment: ŞGK, Data collection and entry: ETY, Analysis and interpretation: ETY, ŞGK, Literature search: ETY, Writing: ETY, ŞGK

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