

# The prevalence of HBV, HCV, and HIV infections in patients with cataract in Turkey

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## ABSTRACT

**BACKGROUND:** Hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV) cause common infections all around the world. The aim of this study is to determine the HBV, HCV, and HIV prevalence in cataract patients.

**MATERIAL AND METHODS:** This was a retrospective study and was carried out in the ophthalmology clinic of Adana Numune Research and Training Hospital (Adana, Turkey). One hundred and forty patients undergoing cataract surgery were included to the study. The clinical findings were extracted from the medical records of the patients. The serological analyzing was done by one step immunoassay-based rapid diagnostic card tests for hepatitis B surface antigen (HBsAg), anti-HCV, and anti-HIV antibodies. HBV and HCV confirmations were done by ELISA (enzyme-linked immunosorbent assay test)-based serological tests.

**RESULTS:** Of the 1040 patients included in the study, 462 (44.4%) were females and 578 (55.6%) were males. The mean age of the patients was  $64.8 \pm 13.7$  years. HBsAg was positive in 39 (3.8%) patients and Anti-HCV was positive in 14 (1.3%) patients. None of the patients had HIV.

**CONCLUSION:** HBV is the most common infection among cataract patients and it is very important to apply infection prevention methods.

**KEY WORDS:** HBV; HCV; HIV; prevalence; cataract

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## INTRODUCTION

Hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV) cause infections that are transmitted directly or indirectly by blood, blood products, and body fluids. They are very common in the population. According to the World Health Organization, HBV prevalence ranges from 0.7% to 6.2%, HCV from 0.5% to 2.3%, HIV from 0.4% to 3.1%. These infections are also quite important for health workers who are in high risk group. They may cause serious chronic liver and other organ diseases which needed to be prevented. Additionally, these infections can be transmitted from patient to patient easily [1].

Cataract is one of the most common eye diseases in the world. Surgery with local anesthesia is often used for the treatment of cataract. Local anesthesia is performed in the peribulbar or subtenon area in the form of injection. Since the injection process is too hard, the injector can be inserted into the hands of the surgeon or nurse. It has been estimated that a surgeon sustains 0.8 injuries/100 h of surgery time, resulting in a 6.9% lifetime risk of contracting hepatitis C and a 0.15% lifetime risk of HIV infection [1].

HBV, HCV, and HIV infections cause serious health problems around the world. There are approximately 350 million HBV and 210 mil-

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**Table 1. The frequency of hepatitis surface antigen (HBsAg), hepatitis C antibody (anti-HCV), and human immunodeficiency virus antibody (anti-HIV) in patient with cataract**

		Min-Max	Median	Mean $\pm$ SD/N%	
Age		3-97	66.0	64.8 $\pm$ 13.7	
Age		< 18		12	1.2%
		18-29		12	1.2%
		30-39		28	2.7%
		40-49		75	7.2%
		50-59		198	19.0%
		60-69		357	34.3%
		70-79		254	24.4%
	$\geq$ 80		104	10.0%	
Gender	Female			462	44.4%
	Male			578	55.6%
HBsAg	(-)			1001	96.3%
	(+)			39	3.8%
Anti-HCV	(-)			1026	98.7%
	(+)			14	1.3%
Anti-HIV	(-)			1040	100%
	(+)			0	0.0%

SD — standard deviation

lion HCV patients worldwide [2–4]. HBV, HCV, and HIV can be transmitted by percutaneous or perinatal route, contacts with the infected person, and sexual intercourse. The frequency of transmission of HBV and HCV is higher among health workers since HBV and HCV can remain on surgical tools such as scalpels or needles and in body fluids such as saliva or ejaculate. Therefore, the patients are screened by serological tests against these viral agents before invasive procedures such as surgery. Some studies have also showed the risk of transmission of HBV, HCV, and HIV during sequential phacoemulsification operation.

The aim of this study is to define the hospital-based prevalence of HBV, HCV, and HIV infections in 1040 patients undergoing cataract surgery and to investigate the possible risk factors for these infections.

## MATERIAL AND METHODS

This study was carried out between September 2016 and September 2017 with 1040 patients who were hospitalized in the ophthalmology clinic of Adana Numune Research and Training Hospital because of cataract surgery and had serologic tests for HBV, HCV, and HIV before the operation. The cataract patients were subjected to detailed ocular examination and laboratory research. Tests were car-

ried out by qualified and trained technicians under an experimental microbiologist.

Results were commented as per the WHO and National AIDS Control Organization (NACO) guidelines for commendation of fast diagnostic card tests [5–8]. Reports of the tests were underwritten by microbiologists. The serological analysis was done by one step immunoassay-based rapid diagnostic card tests for HBsAg (hepatitis B surface antigen), anti-HCV, and anti-HIV antibodies. In addition, HBV and HCV confirmations were done by ELISA (Enzyme-Linked ImmunoSorbent Assay test)-based serological tests.

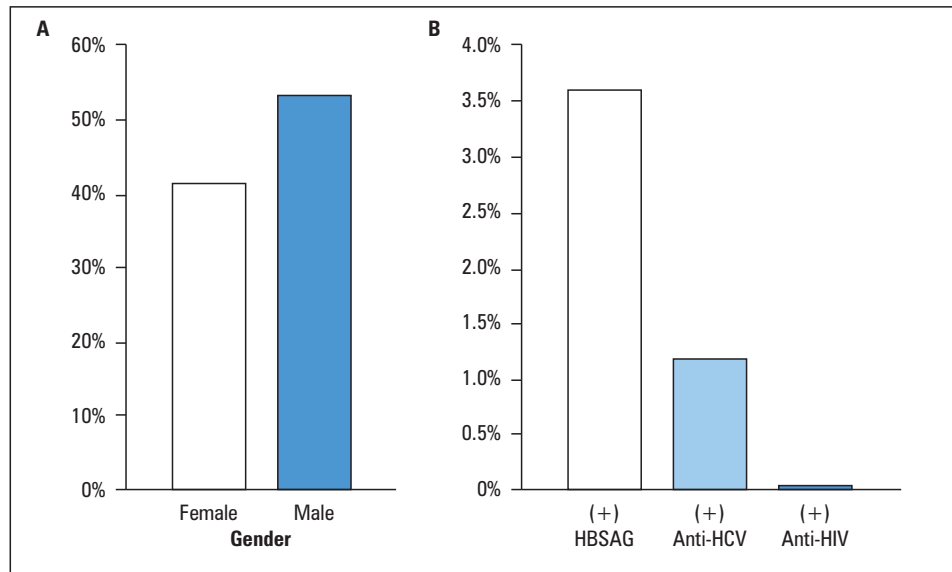
The files of all patients were retrospectively reviewed. The demographic details such as age, gender, and address were extracted from the medical records of the patients. Serological test results were noted as positive and negative.

## STATISTICAL METHOD

Mean, standard deviation, median lowest, highest, frequency and ratio values were used in descriptive statistics of the data. SPSS 22.0 program was used in the analysis.

## RESULTS

The demographic variables and frequencies of HBsAg, anti-HCV, and anti-HIV in patients with cataract are shown in Table 1. Of the 1040 patients



**FIGURE 1.** The demographic (A) and clinical (B) variables of the sample. HBsAg — hepatitis surface antigen; anti-HCV — hepatitis C antibody; anti-HIV — human immunodeficiency virus antibody

included in the study, 462 (44.4%) were female and 578 (55.6%) were male. The age range was 3–97. The mean age of the patients was  $64.8 \pm 13.7$ . HBsAg was positive in 39 (3.8%) patients and Anti-HCV positive in 14 (1.3%) patients. None of the patients had HIV. HBV was the most common viral infection among cataract patients.

## DISCUSSION

Employees in the health sector have a higher risk of HBV, HCV, and HIV transmission since the risk of contact with blood and blood products is higher than that of normal people. In addition, there is the possibility that an anti-HCV positive healthcare personnel may transmit HCV to other patients and health care personnel. In our country, health personnel constitute the most important risk group for hepatitis and HIV. Employees such as physicians, nurses, or laboratory workers who carry the blood samples are in the risk group.

In our country, the incidence of HBV and HCV infection in health workers is at least 3–6 times higher than in people working in other occupations. Surgical physicians are 5.5 times more injured than other specialist physicians and exposed to contact with blood or other body fluids. In 12.2% of the operations, cutaneous injuries, and in 14.7% of the operations, blood and body fluid transmission are seen. In some studies, the risk of contamination of HBV and HCV because of a contaminated injec-

tor has been reported as 7–30% and 4–10%, respectively. The risk of transmission after a contact with mucosa was 0.36% for HCV and 0.09% for HIV, 0.5–4% and 0.1–0.3% after percutaneous injury [9, 10]. The probability of emergence of acute HCV infection following needle sticking to the healthcare personnel is 1.8% on average.

According to our study, the total prevalence of virus infection (HBV, HCV, and HIV) was 5.01% between cataract patients. In our study, HBsAg, anti-HCV, and anti-HIV positivity were found to be 3.8%, 1.3%, and 0%, respectively. Similar to our research, some studies from India and Pakistan showed that viral seroprevalence ranged between 4% and 16% [11, 12]. In a study of orthopedics and traumatology patients, HBsAg, anti-HCV, and anti-HIV seroprevalence were found to be 2.3%, 0.6%, and 0%, respectively [11]. In a study of patients scheduled for plastic and reconstructive surgery, HBsAg, anti-HCV, and anti-HIV were found to be 1.5%, 0.39% and 0%, respectively [12]. HBsAg, anti-HCV, and anti-HIV positivity were found to be 3.1%, 0.54%, and 0%, respectively, in a study of patients planned for urological surgery [8]. In a study conducted by cardiologists, HBsAg, anti-HCV, and anti-HIV positivity in patients undergoing angiography were 2.2%, 0.2% and 0%, respectively. In an ophthalmology study, it was found that 5.9% of patients undergoing cataract surgery were seropositive for HIV (0.09%), HBV (1.8%), or HCV (4.0%) [16]. Another ophthalmol-

ogy study from Nigeria showed that 0.2% of the patients were found to be HIV seropositive while 1.5% were HbsAg-positive [17]. In a donor cornea study, the seroprevalence of HIV, HBV, HCV, and *T. pallidum* in eye donors was 1.58%, 0.52%, 0.10%, and 0.21% respectively [18].

The use of materials like gloves to protect HBV, HCV, and HIV infections is very important for health personnel. It has been reported that the use of gloves reduces by 50% the amount of blood reaching the tissue as a result of needle sting, and the use of double gloves reduces this amount to 7% [15]. It is also recommended to use a mask for the face and surgical goggles for the eyes. Vaccination significantly reduced the incidence of acquired HBV infection. However, protection against HCV and HIV infection is not possible with a vaccine, so protection materials such as gloves, masks and goggles are very valuable for preventing these infections [13].

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### STATEMENT OF COMPETING INTERESTS

The authors report no competing interests.

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