

Prevalence of Hepatitis B and C in the Patients Going for Ocular Surgery.

Faiza Mushtaque¹, Fizzah Farooq^{2,*}, Fahad Khan³, Fahad Mehmood⁴,
Waqar Abbasi⁵, Qurat ul Ain Sheikh⁶

ABSTRACT:

Objective: To document the prevalence of hepatitis B and C in patients undergoing ocular surgery at an eye hospital before surgery.

Methodology: This descriptive cross-sectional study was carried out at Al-Baseer Eye Hospital in Karachi. Participants of both sexes aged between 18 and 75 years who were scheduled for cataract surgery under local anesthesia were included in our study. After collection, the data was processed and analyzed using statistical methods via SPSS software version 26. To gain a deeper insight into the possible impact of various factors on the outcomes, stratification was conducted for variables including age, gender, history of blood transfusion, prior surgeries, and family history of hepatitis.

Results: A total of 134 patients participated in the study. The mean age of the participants was 55.28 ± 4.04 years, with 58% male and 42% female. The prevalence rates for Hepatitis C and B were 10.45% and 2.99%, respectively, while the combined prevalence of both hepatitis B and C was 13.43%. A significant clinical correlation was identified between risk factors such as family history of hepatitis, history of blood transfusions, and history of intravenous drug use with the outcomes ($p < 0.05$).

Conclusion: The results indicate a notable presence of silent carriers of hepatitis B and C in patients set to undergo cataract surgery. Therefore, it is highly recommended that all cataract patients be screened prior to surgery to reduce the potential risk of disease transmission from undiagnosed carriers.

Key Words: Cataract surgery, Hepatitis B, Hepatitis C, Frequency.

Cite as: Mushtaque F, Farooq F, Khan F, Mehmood F, Abbasi W, Sheikh QUA. Prevalence of Hepatitis B and C in the Patients Going for Ocular Surgery. J Muhammad Med Coll. 2026.16 (2) pp.113-17

Introduction:

Hepatitis refers to an inflammation of liver, mostly it is caused by hepatitis virus, once it enters the body it may cause self-limiting inflammation of liver with lifelong immunity however in some cases it becomes chronic and cause decompensated liver disease and carcinoma of liver.

¹ Hepatitis viruses are attributed to about 1.1 million deaths per year.² There are five types of hepatitis viruses, with hepatitis B and C being particularly more important due to their association with morbidity, mortality, and the potential for endemicity because of their chronic nature.

The yearly number of HBV-related deaths worldwide is predicted to rise by 39% between 2015 and 2030.³

According to estimates by the World Health Organization

1. Senior Women Medical Officer (Consultant), Department of Ophthalmology and Visual Sciences, Civil Hospital, Karachi, Pakistan
2. Women Medical Officer (Consultant) Department of Ophthalmology and Visual Sciences, Civil Hospital, Karachi, Pakistan,
3. Ophthalmologist, Al-Baseer Eye Hospital, Karachi
4. Senior Medical Officer (Consultant), Department of Ophthalmology and Visual Sciences, Civil Hospital, Karachi, Pakistan
5. Senior Medical Officer (Consultant), Department of Ophthalmology and Visual Sciences, Dr Ruth K.M.Pfau Civil Hospital, Karachi, Pakistan
6. Senior Registrar, DOW Medical College, DUHS, Karachi, Pakistan.

Corresponding Author :

Email: fizzah.farooq@hotmail.com.

Received: 20.10.2025

Revised: 05.01.2026

Accepted: 10.01.2026

Published online: 20.03.2026

(WHO), in 2019, approximately 58 million individuals globally were living with chronic hepatitis C virus (HCV) infection. In the same year, around 1.5 million new cases (ranging between 1.3 and 1.8 million) were reported, along with an estimated 290,000 deaths resulting from HCV-related complications.⁴ The prevalence of hepatitis in many Asian countries is elevated due to insufficient basic healthcare facilities; factors such as lack of awareness about the disease, poverty, and other issues may play a role. According to the United Nations Human Development Index, Pakistan ranks 134th out of 174 countries globally.⁵ According to the United Nations Human Development Index, Pakistan holds the 134th position among 174 countries worldwide.⁶

A significant number of individuals in Pakistan are already infected with the virus, as the disease is often asymptomatic. Consequently, those infected are typically unaware of their condition, which poses a serious chronic liver disease and allows for the continued transmission of the infection within the community. The prevalence of hepatitis B in Pakistan stands at 4.13%, while hepatitis C is notably higher at 29.79%.⁷ The prevalence continues to rise particularly in rural areas where healthcare facilities are severely lacking, resulting in even higher percentages. Hepatitis B is transmitted through contact with infected blood, semen, and bodily secretions; it can also be vertically transmitted from mother to child during childbirth.⁸

Hepatitis B virus poses an occupational risk to health care providers who sustain contact from contaminated blood, body fluids, syringes and sharp surgical instruments.⁹ Hepatitis C is mainly transmitted through infected blood and contaminated syringes and surgical instruments during surgical procedure.¹⁰

Both hepatitis B and hepatitis C infection are often asymptomatic until they reach advance stages resulting in a significant number of undiagnosed cases. Most of the ocular

surgeries are being carried out on day care procedure and without general anesthesia therefore many centers of ocular surgery especially camps have established all around the country.¹¹

In addition to this, in remote underdeveloped areas where camps and secondary centers perform surgeries, hundreds of patients undergo operations without hepatitis screening. This situation places doctors and paramedical staff at occupational risk, while also increasing the likelihood of transmission to other patients through contaminated instruments and machines. Due to limited resources in the underdeveloped world, it is not possible to utilize new instruments or sterilize the equipment used in surgeries for each patient.¹²

Ophthalmic surgical teams are at occupational risk of blood and other body fluid exposure during surgeries. Although pre-operative screening of hepatitis B and hepatitis C is already standard practice in most secondary and tertiary surgical centers, the value of this research lies not in questioning the necessity of such screening but in documenting the updated localized epidemiological burden in specific population. Further updated local data is essential for guiding infection control policies, resource allocation and monitoring the effectiveness of global and national elimination strategies. Cataract patients being older grouped population with variety of risk factors, contribute to valuable population for detecting silent carriers who remain undiagnosed. Thus this study will provide epidemiological insight, contribution to public health surveillance and reinforces the role of pre-operative screening as both a safety measure and an opportunity for case detection and linkage care.

Objective:

To ascertain the prevalence of hepatitis B and C in patients undergoing ocular surgery at an eye hospital before surgery.

Methodology:

This descriptive cross-sectional study was conducted at Al-Baseer Eye hospital, Karachi. Sample was collected via non probability consecutive sampling technique after getting approval from the ethical board committee; Ref # ABEH-ERB/09-25/003. Verbal and written consent was sought from the agreeing participants. Participants of both genders within the age range of 18 to 75 years who were booked for cataract surgery under local anesthesia were enrolled for our study. Patients with already diagnosed liver disease and seropositive for hepatitis B and hepatitis C were excluded from the study. According to literature prevalence of hepatitis B in patients going for ocular surgery is 5.3%¹³. Hence, taking confidence interval 99% and margin of error 1% then the estimated sample size was n=134 via Open Source Epidemiologic and Statistical calculator (Open Epi). Questionnaire were filled that contain demographic details, patient's known co morbid and history of blood transfusion. Record of vaccination for hepatitis B, history of previous surgeries, use of intravenous drugs and history of contact with hepatitis patient was taken to control the effect modifiers of the study. Information of subjects was kept confidential.

Blood samples were collected from the patients under aseptic conditions and were sent to blood lab of Al-Baseer eye hospital, Karachi, where blood samples were tested by ICT (immunochromatography) method. ICT is a qualitative test for detection of hepatitis B surface antigen and hepatitis C antibody in the 74 serum. In this test the sample of serum (2 drops) is used in the ICT kit for hepatitis B. The positive sample shows 2 pink lines whereas negative sample shows only one pink line. Same is for hepatitis C ICT

kit. It also shows 2 pink lines in the test area for hepatitis C positive sample and only one line in hepatitis C negative blood sample. The data for this study was systematically documented using a structured sheet to maintain accuracy and consistency. Once collected, the information was processed and analyzed with the help of statistical techniques through Statistical Package of Social Sciences (SPSS) software version 26. Measures of central tendency and dispersion, particularly the mean and standard deviation, were computed to characterize quantitative data, including the participants' age.

These variables included gender, place of residence, history of blood transfusion, previous surgical procedures, intravenous drug use, family history of hepatitis, as well as the main outcome variables, which were the presence or absence of Hepatitis B and Hepatitis C.

To better understand the potential influence of different factors on the outcomes, stratification was performed for variables such as age, gender, history of blood transfusion, previous surgeries, and family history of hepatitis. This step allowed the researchers to examine whether these characteristics had a significant effect on the rate of Hepatitis B and C among the participants. After stratification, a chi-square test was applied to identify any statistically significant relationships, with a p-value of 0.05 or less taken as the threshold for significance.

Results:

In this study total 134 patients who were scheduled for ocular surgery during the preoperative phase were included to assess the prevalence of Hepatitis B and Hepatitis C. Following data collection, the results underwent a comprehensive analysis. Most of the patients fell within the medium to older age range, as indicated by the participants' average age of 55.28 years, with a standard deviation of ± 4.04 years. Among the study population, 78 patients (58%) were male, while the remaining 56 (42%) were female, showing a slight male predominance. When examining residential background, it was observed that a majority, 95 patients (70.69%), lived in urban areas, whereas 39 participants (29.1%) came from rural settings. With regard to medical history, 65 patients (48.5%) reported having received a blood transfusion at some point, and 52 individuals (38.8%) had undergone some surgical procedures in the past. A history of intravenous drug use was noted in 28 patients (20.9%), highlighting a considerable risk factor within this group. Additionally, 25 participants (19%) reported a positive family history of hepatitis, which may suggest potential hereditary or household exposure risks. A detailed overview of the patient's clinical and background histories, as assessed through the questionnaire, is presented in table no 1.

Table No 1: Demography of sample population (n:134).

Risk factor	Yes, n (%)	No, n (%)
Blood transfusion	65 (48.5%)	69 (51.5%)
Surgical history	52 (38.8%)	82 (61.2%)
Intravenous drug abuser	28 (20.9%)	114 (79.1%)
Family history of hepatitis	25 (19%)	109 (81.3%)

When assessing the occupational background of the study participants, the largest proportion were office workers, accounting for 38 individuals (28.4%). This group was followed by housewives, representing 32 participants (23.88%), while 26 individuals (19.4%) were engaged in

field-based work. In terms of educational attainment, the highest percentage of patients had completed a master's degree or higher qualification, with 45 participants (34.3%) falling into this category. The second largest group consisted of those who had studied up to the intermediate level, totaling 34 individuals (25.4%). In the overall study population, the combined prevalence of Hepatitis B and Hepatitis C was observed in 18 patients (13.43%), while the remaining 116 participants (86.6%) tested negative for both infections. Breaking this down further, Hepatitis B was detected in 4 individuals (2.99%), whereas Hepatitis C was identified in 14 participants (10.45%). For statistical analysis, the chi-square test was applied to explore possible associations between baseline variables and the presence of Hepatitis B or C. The results indicated that gender, age, place of residence, and previous ocular history did not show any statistically significant correlation with the outcomes, as the p-value for each of these comparisons was greater than 0.05. Similarly, no significant association was found between either occupational status or educational level and the prevalence of Hepatitis B ($p > 0.05$). However, both occupational status and educational status demonstrated a statistically significant relationship with the prevalence of Hepatitis C, with a p-value less than 0.05. These findings are summarized in detail in Table 2.

Table 2: Stratification of educational and occupational status with Hepatitis C (n=134).

	Hepatitis C		p value
	Yes	No	
Occupational status			
Labourer	7(0.5%)	8(6.0%)	0.0001
Farmer	1(0.7%)	2(1.5%)	
Office Worker	9(6.7%)	29(21.6%)	
Housewife	2(1.5%)	31(23.1%)	
Field Worker	7(0.5%)	25(18.7%)	
Health Care Worker	1(0.7%)	20(14.9%)	
Others	1(0.7%)	5(3.7%)	
Educational Status			
Not Went to School	1(0.7%)	30(2.2%)	0.0001
Primary	2(1.5%)	6(4.5%)	
Secondary	7(0.5%)	3(2.2%)	
Intermediate	5(3.7%)	34(25.4%)	
Graduation	28(2.1%)	31(23.1%)	
Masters or Above	2(1.5%)	44(32.8%)	

A statistically significant correlation was identified between the prevalence of both Hepatitis B and Hepatitis C and certain risk factors. Patients with a history of blood transfusion, those who reported intravenous drug use, and individuals with a positive family history of hepatitis were found to have a notably higher likelihood of infection. These associations highlight the importance of these variables

as potential predictors of hepatitis in the study population. A detailed summary of the variables that demonstrated significant correlations with Hepatitis B and Hepatitis C is presented in Table 3.

Table 3: Stratification of Hepatitis B and C with respect to study variables (n=134)

		Blood Transfusion		
		Yes	No	p value
Status of Hepatitis B	Yes	31 (2.3%)	1 (0.8%)	0.080
	No	62 (46.3%)	68 (50.7%)	
Status of Hepatitis C	Yes	9 (6.7%)	5 (3.7%)	0.041
	No	56 (41.8%)	64 (47.8%)	
		Intravenous Drug User		
		Yes	No	p value
Status of Hepatitis B	Yes	3 (2.2%)	1 (0.8%)	0.0001
	No	24 (18.0%)	106 (79%)	
Status of Hepatitis C	Yes	9 (6.7%)	4 (3.0%)	0.0001
	No	18 (13.4%)	102 (76.1%)	
		Family History of Hepatitis		
		Yes	No	p value
Status of Hepatitis B	Yes	4 (3.0%)	1 (0.8%)	0.0001
	No	21 (15.7%)	109 (81.3%)	
Status of Hepatitis C	Yes	11 (8.2%)	3 (1.5%)	0.0001
	No	14 (10.3%)	107 (79.7%)	

Discussion:

This study reported a combined prevalence of hepatitis B and C of 13.11%. A previous study conducted in the same hospital in 2011 demonstrated comparable findings, with a combined prevalence rate of 12.99%.¹⁴ This was greater than the 5.75% documented by Iftikhar et al.¹⁵ In contrast, Khan et al. found a considerably greater prevalence of 24% in rural Sindh eye camp participants, rather than in hospitalized patients.¹⁶ Muhammad Ali et al. documented a prevalence of hepatitis B in 17 cases (2.62%), while hepatitis C was detected in 40 cases (6.17%) among Pakistani ophthalmic patients.¹⁷ Whereas in our study hepatitis B was found in 4 (2.99%) patients and hepatitis C was found in 14 (10.45%). The elevated prevalence reported in studies conducted at eye camps, compared to hospitalized patients, may be attributed to their implementation in rural settings and the extended duration over which the studies were carried out. Among preoperative cataract patients,

the incidence of hepatitis B and C was notably higher in males (59.18%) than in females (40.82%). Mazhar Zaman et al. conducted a study at Al Shifa Hospital in Khanpur, revealing that out of 2,056 patients, 1,043 (50.73%) were male, while 1,013 (49.27%) were female.¹⁸

This disparity may be attributed to the increased social mobility and freedom generally experienced by males in Pakistan, especially in rural regions, which heightens their chances of exposure and, as a result, their risk of contracting the infection. However, a study conducted in a tertiary care hospital in Jamshoro, Pakistan, indicated that 51.7% of the patients were female and 48.22% were male, which contradicts our results.¹⁹

Participants between the ages of 50 and 85 exhibited the highest number of positive cases for hepatitis B and C in our research, with an average age of 55.28 ± 4.04 years. A study focused on hepatitis C and hepatitis B carried out at Abbasi Shaheed Hospital in Karachi found that the incidence increased as the age of the study participants rose. The prevalence of hepatitis C was 70% in people over 50 and 30% in those under 50.²⁰ The Combined Military Hospital, Kharian reported the mean age of population study as 52 years with most patients being above 51 years.²¹

The greater frequency of age-related cataracts could account for the higher burden of hepatitis B and C in the elderly population. Our research encompassed a varied group of individuals from the rural regions of Sindh and Baluchistan, in addition to those from the metropolitan zones and suburbs of Karachi. A total of 70.96% resided in rural settings, while 29.04% came from urban locales. A study conducted by Iftikhar et al. similarly indicated a greater proportion of participants hailing from rural areas, specifically 45% from rural and 55% from urban.¹⁵

This study had specific limitations. Individuals under the age of 18 were excluded, which could influence the generalization of the results. Furthermore, as the study concentrated on patients belonging to a particular age group and those suffering from an age-related issue (cataract), the prevalence rates noted might be either higher or lower as compared to the general population. The study design did not allow for the gathering of additional potential risk factors, such as healthcare practices, risky sexual behavior, multiple sexual partners, or tattooing, which may affect hepatitis infection rates. Consequently, interpretations concerning the differences in prevalence based on age and gender were restricted to known risk factors, including intravenous drug use, previous hepatitis history, and blood transfusions.

To overcome these limitations, further multi-center studies with larger sample sizes are necessary. Considering the relatively high prevalence of these viral infections within the population, it is vital to conduct regular screenings for hepatitis B and hepatitis C among patients. Additionally, mass media can play a crucial role in raising public awareness about these diseases.

Conclusion:

This study identified a significant number of asymptomatic carriers of both hepatitis B and hepatitis C among patients awaiting cataract surgery. These results highlight the potential risk posed by undiagnosed infections within surgical populations. Routine preoperative screening for hepatitis is highly recommended for all patients undergoing cataract surgery. By implementing these preventive strategies, we can improve patient safety and minimize the risk of inadvertent transmission of infections within healthcare settings.

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Authors' Contribution	
Faiza Mushtaque	Conceived idea, literature Review
Fizzah Farooq	Writing Introduction
Fahad Khan	Developed Proforma,
Fahad Mehmood	Data Collection
Waqar Abbasi	Data Analysis,
Qurat ul Ain Sheikh	Manuscript draft writing