



## Original Research Article

## Risk and safe practice pattern for ophthalmologists in seropositives

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## ABSTRACT

**Objective:** To analyze the risk involved in eye surgery and follow safe practice pattern in Seropositive [Hepatitis B (HBV), Hepatitis C(HCV) and Human Immuno-deficiency Virus (HIV)] cases.

**Materials and Methods:** This retrospective analysis was done at a Private Eye Hospital in Tier three city of Haryana, North India. Duration of study was from 1.4.2015 to 31.3.2020. Total of 1803 patients' data was screened and analyzed. All patients who underwent eye surgery in our hospital and viral markers testing was done were included in the study.

**Results:** Out of 1803 patients' data screened, 62 (3.44%) patients were found to be seropositive for these viral infections; 23(1.28%) were HBV positive, 36(2.0%) were HCV positive, two (0.11%) were HIV positive and only one (0.06%) patient had both HBV and C. There was slight male preponderance (51.61%) in our study. Maximum seropositives (6.98%) were from the age group of 31-40 years, with decrease in incidence and increasing age. None of the patients were found in age group of less than 30 years.

**Conclusions:** Preoperative screening of blood borne viral infections and following safe practice patterns plays vital role in identifying many asymptomatic carriers and minimizing transmission of virus from patients to health care workers and other patients. The high incidence of these infections in younger age group is a matter of concern suggesting these as an emerging new disease of young.

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## 1. Introduction

Three pathogens account for most cases of occupationally acquired blood-borne viral infection (BBVI): Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and Human Immunodeficiency Virus (HIV). Most common occupational transmission is due to percutaneous injury via hollow-bore needles with vascular access.<sup>1</sup> The prevalence of transmissible BBVI is quite high in the developing countries.<sup>2</sup> Health Care Workers (HCW), (constantly in contact with body fluids, infected individuals and laboratory equipment), include surgeons, emergency doctors, nurses and laboratory professionals are identified as having highest risk of exposure.<sup>3</sup> According to the World Health Organization (WHO) data, 35.7 million health care workers

in the world are exposed to the risk of NSIs.<sup>4</sup> The risk of HBV transmission is estimated as highest followed by HCV and then HIV due to occupational exposure.<sup>5</sup> In case of hepatic viruses HCV and HBV, most of the cases remain unnoticed because of their asymptomatic nature in the initial phase of infection.<sup>6</sup> Both these viruses have contributed in causing major dreadful liver infections around the globe. According to an estimate there are 200 million chronic carriers of HCV and 350 to 400 million chronic carriers of HBV.<sup>7</sup> The prevalence of BBVI among patients of cataract surgery is around 4-10%.<sup>8-11</sup> The incidence of needle stick injuries (NSI) in eye care is 0.07/1000 surgeries.<sup>12</sup> India has the third largest HIV epidemic in the world.<sup>13</sup> In 2017, HIV prevalence among adults (aged 15-49) was an estimated 0.2%. This figure is small compared to most other middle-income countries but because of India's huge population (1.3 billion people) this

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equates to 2.1 million people living with HIV.<sup>13,14</sup>

The present study was undertaken to understand the risk involved and practice pattern of eye surgeons when operating on seropositive individuals.

## 2. Material and Methods

This retrospective analytical study was carried out in a private eye hospital of North India from Jan 2015 to March 2020. Data of 1803 cases of either sex who were operated as elective cases, was screened and analyzed. Laboratory work up of cases screened for the study included routine blood sugar, urine routine analysis and serology for HBV, HCV and HIV. Proper consent for HIV testing was taken before taking the sample for laboratory workup. These tests were done in house fully NABL and NABH accredited pathology lab under the supervision of inhouse pathologist. Serology workup for HBV was done by rapid card test; HCV and HIV I and II was done by tridot rapid card test. Ethical consideration like confidentiality about the study, patient's name and their results were maintained.

IPD (In Patient Department) files of seropositive patients were marked with code 'HHH+' for the information of the staff and doctors. Barrier nursing was practiced for seropositive cases and special protocol was followed at all stages (Preoperative and Operative).

Pre operative protocol included syringing with disposable 26G canulas in the last. Biometry was done with IOL master 700 TK (Carl Zeiss Meditek)/ Axis Nano (Quantel Medical)/ Appasamy A Scan. Tonometry was done with Nidek Tonoref III Non Contact Tonometer(NCT)/Huvitz NCT. In case of use of Prager Shell/ A scan Probe in sero positives, the procedure was done in the last and then disinfected properly.

Operative protocol included seropositive cases to be operated in the last and only one case was posted per day; other protective measures included use of disposable linen, double gloves for surgeon and assistant, use of disposable instruments as far as possible. Sharp instruments were handled with care to avoid needle stick injury (NSI). In case of NSI, proper Post Exposure Prophylaxis (PEP) guidelines as recommended by NACO were followed.<sup>15</sup> A separate set of re-usable instruments, pre labeled for seropositive cases was used. Post surgery, this set was immersed in glutaraldehyde for prescribed time then cleaned with distilled water and was doubly autoclaved before use for next positive case. All the disposable instruments and other consumables were disposed off as per bio medical waste management guidelines. Data was compiled and analyzed using Microsoft excel 2007 and SPSS software.

## 3. Results

In this study, data of 1803 patients who were operated for various eye ailments was screened for HBV, HCV and

HIV. Out of 1803 patients, there were 880 (48.80%) males and 923 (51.20%) females (Table 1). Mean age was 61.08 years, age ranged from 1 year to 97 years. Total 62 (3.44%) patients were found to have HBV, HCV or HIV. 23 (1.28%) were positive for HBV, 36 (2.0%) patients were positive for HCV, 2 (0.11%) patients were found positive for HIV and one (0.06%) was found positive for both HBV and HCV (Table 1). In our study, no patient was found to be simultaneously affected by all three (HBV, HCV and HIV).

HBV was found in 14 (1.59 %) males and 9 (0.98%) females, it showed male preponderance. HCV was found in 18 (2.05%) males and 18 (1.95%) females again showed slight male preponderance. HIV showed female preponderance as positive patients were both females. HBV and HCV positive patient was also female.

Table 2, maximum incidence (6.98%) of patients were young from the age group of 31-40 years, followed by 4.35% in the age group of 41-50 years. None of the patients were found in age group of less than 30 years. The incidence went on decreasing with the increase of age group with only 2.53% in the age group of more than 70 years.

## 4. Discussion

Prevalence of HBV, HCV and HIV is on the rise in the country which is a great threat to the community. Many of the individuals are asymptomatic carriers which adds up the threat. According to some studies HBV and HCV has affected around 4%-10% of general population.<sup>10,11,16</sup> There are very limited studies available and these cannot give clear scenario of prevalence of BBVIs' in the country particularly among asymptomatic healthy individuals. In our study, we analyzed data of every individual who came to us for eye surgery. As the eye surgery is elective, these individuals were without any symptoms of any systemic BBVI disease. This retrospective data analysis gave us an idea about silent carriers of these diseases. Mean age of our study group was 61.08 years but the prevalence of these diseases is high in younger age group of 31-40 which is 6.98%. This high percentage of prevalence in younger age group is a matter of grave concern. Availability of better treatment options and HAART is a boon in medical field to treat and prevent the spread of these BBVIs'. More or less, due to availability of these treatment options, the rate of infection is decreasing and more people are becoming asymptomatic carriers. Transmission of virus is through blood and body fluids, and source of spread of these infections in medical field is through the use of improperly sterilized syringes and instruments, unsafe blood transfusion, vertical spread from mother to child, and sexual abuse.<sup>17</sup> Our retrospective review of HBV, HCV and HIV is very alarming. Table 1 showed that prevalence rate of HBV is 1.28%, HCV is 2.0% and HIV is 0.11 % and HBV and HCV is 0.06%. Our results also showed that overall prevalence of BBVI is high in males as compared

**Table 1:** Disease distribution with gender

Gender	No Disease	HBV	HCV	HIV	HBV+HCV	Total infected	GT
<b>Male</b>	848	14	18	0	0	32	880
%	96.36	1.59	2.05	0.00	0.00	3.64	48.80
<b>Female</b>	893	9	18	2	1	30	923
%	96.75	0.98	1.95	0.22	0.11	3.25	51.20
<b>Total</b>	1741	23	36	2	1	62	1803
%	96.56	1.28	2.00	0.11	0.06	3.44	

**Table 2:** Age wise distribution of seropositive cases

Age wise	Positive	Total	%
1-30	0	29	0.00 %
31-40	3	43	6.98 %
41-50	9	207	4.35 %
51-60	24	560	4.29 %
61-70	18	648	2.78 %
71+	8	316	2.53 %
Total	62	1803	

to females which is similar to other studies carried out in Karachi.<sup>18,19</sup> The greater frequency of BBVI in males could be due to more social mobility of males as compared to females making them more vulnerable for the infections. Prevalence rate of BBVI was observed higher in 31-40 and 41-50 years of age group. The transmission risk of HIV is 0.3% and HBV is 30%.<sup>20</sup> Transmission of these BBVIs is a well documented occupational hazard for healthcare workers.

The risk of occupational infection from known viral pathogen for surgeon is low and can be further reduced by employing effective barriers, modifying pattern of practice and prompt response to blood exposure events.<sup>21</sup> We followed many safe practice patterns to minimize the risk and to safeguard us against cross transmission of blood borne infections. These safe practice patterns can be grouped as pre operative and operative (Table 3).

Our guidelines for pre operative safe practice patterns include detailed history regarding BBVI. As some patients do not disclose, due to social stigma, we go for 100% screening for viral markers on OPD basis. Further, it is also necessary to do viral markers before surgery and to inform patients, to safe guard the hospital from any post op litigation by any of the patient claiming that he has acquired infection in the hospital during procedure.

In case of positive report, patient is properly informed about the report, counseled for his confirmatory tests and treatment by physician if required, his/her file is marked with code as per hospital policy, syringing and A scan is done in the last. Probes thoroughly disinfected after the procedure. Only one Seropositive case is posted for surgery per OT day and that patient is operated in the last with proper and safe operative practice pattern. It includes double gloves by the surgeon and assistant, impervious gown during surgery, use of disposable drapes, use of

**Table 3:** Safe practice patterns followed by our hospital

Pre Op	Operative	Post op	Staff
1. History of BBVI	2. 100% screening for viral markers on OPD basis	3. Patient is informed about the report and counseled	4. File is marked with code
5. Syringing and A Scan in the last	6. Disinfect Probe	7. Post one patient per day, in the last	8. Double gloves, impervious gown
9. Disposable drapes	10. Use of maximum disposable instruments	11. Separate set of re-usable instruments (marked for Seropositive patients)	12. Proper disposal of all bio medical waste as per latest BMW guidelines
13. Re-usables were disinfected by dipping them in Gluteraldehyde for 30 minutes	14. Proper cleaned with ultrasonic cleaner	15. Double autoclaved before next surgery	16. Report of viral markers is printed on the discharge slip
17. Counseled to consult Physician	18. Screened for BBVI	19. Vaccination for HBV	20. Anti HBV titer
21. Prompted/ encouraged to admit/ report NSI			

maximum disposable instruments, separate set of re-usable instruments (marked for Seropositive patients). Post op safe practice pattern includes proper disposal of all bio medical waste as per latest BMW guidelines. Re-usables were disinfected by dipping them in Gluteraldehyde for 30 minutes, proper cleaned with ultra sonic cleaner and double

autoclaved before next surgery.

Ours is a fully NABH accredited hospital and one of the surgeon is NABH assessor. We are following all the safe practices as advocated by NABH. Still, at times, we encounter needle stick Injuries. That means, no one is safe from NSI's. What is more important is that staff should admit and come forward with the incident so that proper post exposure prophylaxis can be taken to avert the hazards.

Further, for the safety of the staff, all the staff is screened for BBI markers, given proper vaccination for HBV and after full course of vaccination, level of Anti bodies for HBV is tested so as to confirm the efficacy of vaccine/ non responders. In case of non-responders, counseling is done for his safety.

## 5. Conclusion

With such a rate of BBI, we recommend preoperative screening of all patients selected for surgery, public awareness should be done by the government agencies and health care workers about the disease and their effective treatment options available so that people should disclose openly with any social stigma, to prevent the disease transmission. In case of seropositives, proper and safe practice pattern should be formulated by each hospital and followed to safe guard themselves, their staff and fellow patients. Post op reporting and counseling is equally important. Staff should be screened, immunized and encouraged to report NSI.

This study emphasize to reduce risk of spread of BBI by doing pre op screening, and following safe practice patterns for safe guarding HCW's and the community.

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## 7. Conflict of Interest

The authors declare they have no conflict of interest.

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