



## PREVALENCE OF BLOOD BORNE VIRAL INFECTIONS IN PATIENTS UNDERGOING ELECTIVE CATARACT SURGERY AT A MILITARY HOSPITAL IN WESTERN INDIAN POPULATION

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### ABSTRACT

**Background:** The study was undertaken to understand the need for serological work-up in patients prior to cataract surgery and to determine the prevalence of blood-borne viral infections (HIV, Hepatitis B and Hepatitis C) among the cataract patients in a western Indian population at a military hospital from January 2015 to April 2018.

**Methods:** Cross-sectional study of 3528 cases that underwent elective cataract surgery by Phacoemulsification with Intraocular lens (IOL) implantation. All the patients underwent thorough routine laboratory work up including haematology, biochemistry, urinalysis, chest X-ray and electrocardiogram. Serological testing for HIV, hepatitis B and hepatitis C was also undertaken after obtaining patient's informed consent and pre test counselling.

**Results:** A total of 3528 patients comprising 1792 males (50.7%) and 1736 females (49.3%) were included in the study. Of these, 25 patients (0.7%) were positive for HIV, HBV, and HCV. Hepatitis B was the most common infection detected (76%). The post-operative results were similar in both seropositive and seronegative patients.

**Conclusion:** Significant number of patients with cataract has blood borne viral infections. This study proves that serological workup is necessary for all the cases posted for elective cataract surgery so that asymptomatic carriers might not become a threat for spread of disease among patients and health care workers.

**KEYWORDS :** Cataract, Phacoemulsification, Blood Borne Viral Infection

### INTRODUCTION:

Cataract surgery is one of the most commonly performed, cost effective and successful surgical procedures worldwide. In India more than 6 million cataract surgeries were done during 2015-16.<sup>1</sup> Varieties of cataract knives, blades and needles are used for performing the various steps of a standard cataract surgical procedure. These sharp and microsurgical instruments pose a risk of sustaining accidental injuries to operating surgeon and paramedical staff during ocular surgery and potential of contracting various blood-borne viral infections. The most common blood-borne pathogens involved in occupational transmission are hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV).<sup>2</sup>

Apart from risk of risk of transmission during actual surgical procedure, the various other diagnostic tests in an ophthalmic evaluation like sac syringing, keratometry, biometry, gonioscopy and tonometry also have the potential to spread these devastating viral infections. A study by Rishi et al reported the incidence of needle-stick injury in a tertiary eye care in India to be 0.07/1000 surgeries.<sup>3</sup> Both needle stick injuries and blood splash are possibly underreported and grossly under-recognized in ocular surgery.<sup>4</sup>

The aim of our study was to estimate the prevalence of blood borne viral infections (HIV, HBV and HCV) in the population that report to our hospital for cataract surgery.

### METHOD:

3528 consecutive patients who underwent elective cataract surgery by phacoemulsification and IOL implantation for senile cataract from January 2015 to April 2018 were analysed. The study was done according to provisions of Declaration of Helsinki. A complete ocular examination was done for all patients including visual acuity, slit lamp examination, intraocular pressure measurement and dilated Fundus examination for retinal and optic nerve evaluation. Complete blood count, blood sugar and urine analysis, chest X-ray and electrocardiogram was done for all the patients. For serological testing for HIV, HBV and HCV, Informed consent was taken from all the patients. Pre test counselling for HIV was done as per NACO guidelines. All the serological tests were done with Immunoassay based rapid diagnostic kits in the hospital laboratory by the trained technician under the supervision of the microbiologist. Ethical considerations like confidentiality about the study patient's name and their results were ensured.

Patients who were positive for HIV on screening and were unaware of their HIV status were counselled as per NACO guidelines. For all serologically positive patients OPD procedures, like sac syringing, IOP measurement, and lens power calculation were done at the end of screening of other cases to prevent cross transmission. All cases were grouped as high risk cases for Operation theatre supportive staff and surgeons and universal precautions were followed in operation theatre. Disposal of needles and sharps was done as per established procedures in puncture proof containers. Seropositive cases were listed as last case of the day to avoid cross contamination with other patients. During surgery surgeon and assistant used impervious gowns. Disposable instruments were used in all seropositive cases. Phaco hand piece and tubings were autoclaved twice at the end of surgery before use on the next operating day.

### RESULTS:

A total of 3528 patients, of which 1792 were males (50.7%) and 1736 were females (49.3%) underwent Phacoemulsification and IOL implantation for senile cataract. Of these 25 cases (0.7%) were found to be seropositive for one or the other blood borne viral infection. None of the seropositive patient was symptomatic of the diseases.

Hepatitis B was the most common infection detected (76%). 19 patients were found to be HbsAg positive including 15 males and 4 female patients. In case of HCV screening, 02 male patients were HCV positive (8%), while 04 patients (16%) were found to be HIV positive of which 1 was male and 3 were female patients. Using Z test to determine the population proportions, it was found that there is no significant difference in the male and female population proportions in HBV infection, but there is a significant difference in population proportion in HIV infection. The frequency of seroprevalence was more in the age group ranging between 45-65 years in both sexes. None of the patient was simultaneously positive for both hepatitis B and C. The post-operative results of the seropositive patients were equivalent to that obtained in seronegative patients.

### DISCUSSION:

Many risk factors have been identified for transmission of hepatitis B, hepatitis C, and HIV virus. These include percutaneous exposure to blood, major surgeries, dental procedures, intravenous drug abuse, tattooing, use of contaminated syringe and blood transfusions. Not all accidental injuries with sharp instruments result in the transmission of infection. The risk of disease transmission depend upon on the pathogen involved, type and severity of exposure,

amount of blood involved in the exposure, and the amount of pathogen in the patient's blood at the time of exposure.<sup>7</sup> The increased risk of needlestick injury to Ophthalmologist and paramedical staff during ocular surgery is due to high number of cataract patients operated in short time, restricted surgical field while operating with microscope and use of sharp and short microsurgical instruments.

The overall seroprevalence of blood borne viral infections (HIV, HBV, and HCV) in our study was 0.7% against the estimated average national prevalence of 0.3% for HIV, 3%-4% for HBV and 0.094%-15% for HCV<sup>2</sup>. This may be due to access to better medical facilities and health awareness among dependants of armed forces members as compared to the general population. The prevalence of HBV was higher than HIV and HCV which is comparable to the overall national average. The prevalence of HCV in our study was the least among the blood borne infections, as compared to results obtained by Parveen et al where HCV was most common viral infection.<sup>2</sup> Seroprevalence for HBV was high in males which is comparable to study done by Sowbhagya et al.<sup>6</sup> This could be a reflection of more social mobility in males than females and thus greater vulnerability to be infected. There was not much gender difference in HIV seroprevalence. The post operative results of the seropositive patients were equivalent to that obtained in seronegative patients, which is similar to the results obtained by Grace Chew et al.<sup>7</sup>

#### CONCLUSION:

Our study found significant prevalence of blood-borne viral infections, mainly HBV among cataract patients. Universal screening as part of preoperative screening should be done for all cataract patients as risk reduction strategy<sup>8</sup>. Sensitization of ophthalmologist and health care workers to be aware about pattern of seroprevalence of viral infections in their practice area could help in observing safeguards against accidental injury and disease transmission. We recommend that Universal precautions suggested by Centre for Disease Control and Prevention should be strictly followed in seropositive cataract cases.<sup>9</sup>

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