ORIGINAL ARTICLE

To find the prevalence of accidental viral markers positivity in the patient undergoing cataract surgery

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Received: 12-09-2020
Accepted: 28-09-2020

How to cite this article:
Jain R. To find the prevalence of accidental viral markers positivity in the patient undergoing cataract surgery. Int J Adv Integ Med Sci 2020;5(3):72-75.

Source of Support: Nil,
Conflicts of Interest: None declared.

Aim: This study aims to find the prevalence of accidental viral markers positivity in the patient undergoing cataract surgery under district blindness control scheme in Rohilkhand region. **Materials and Methods:** It was a retrospective cross-sectional study based at Rohilkhand Medical College. A total of 550 cataract patients were studied and their data were collected from hospital record system. All patients who underwent cataract surgery were tested for hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV). All patients were made to sign informed consent for serological evaluation for HBV, HCV, and HIV. Post-test counseling was given to viral markers positive cases and referred to antiretroviral therapy center for registration, further investigation, and treatment. **Observation and Results:** During the study period, out of 550 patients, 295 were male and 255 were female. Thirty-two patients were positive for viral serology. HbsAg was positive in 24 patients, anti-HCV antibody was positive in 6 patients, and HIV was positive in 2 patients. In these 32 patients, 22 were male and 10 were female. **Conclusion:** Screening for viral markers should be made compulsory in all those patients who are undergoing cataract or any other ocular surgery.

KEY WORDS: Accidently diagnosed, cataract, viral markers

INTRODUCTION

Across the world, cataract surgery is one of the mostly performed common ocular surgery. There is a serious concern world over about the communicable viral infection which readily spreads through various body secretions such as hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV). This is a serious public health problem of global status requiring immediate attention. Knowing the seropositive status of the patients helps in enabling us to make an early diagnosis which also helps in preventing the spread of infection as well as prompts early initiation of treatment. It also helps in making out cases where policy of universal precautions needs to be implemented.

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As per the 2015 survey, overall prevalence of HIV among adults in India is estimated to be 0.26%.[1] India is having the second largest pool of HBV infection in the world with a prevalence of 3–4.2% and has been categorized as an intermediate endemic zone.[2,3] It has been found that HBV infection has a chronic carrier state of about 60%.

The prevalence of HCV infection in India is in low to moderate range with a prevalence between 1% and 1.5% and it carries a major share of HCV infection globally because of large population.[4]

HBV, HCV, and HIV are blood-borne viral infections and the mode of transmission is through direct or indirect contact with the blood of the infected person.[5,6] Some of these positive patients may present to ophthalmic department and could pose a risk of transmission to treating ophthalmic surgeon as well as associated health care workers.[7]

Various factors such as surgical procedure, operation theater sterilization, handling and sterilization of sharp instrument

during surgery, and anesthetic procedure puts the operating surgeon, anesthetic and associated health care workers at high risk of exposure.[7] In most ophthalmic centers, screening of these viral markers is not a routine pre-operative investigation for patients undergoing ocular surgeries and the bulk is contributed by cataract surgery. Since, most of the patients who are infected with the virus are asymptomatic and acts as a potential carrier and pose a real threat to health care workers as well as other patients of hospital.[8-10] After a through literature search, it was found that only a few Indian studies have stressed on these viral screening among patient coming for ocular surgery. Therefore, this study has been undertaken to determine the seroprevalence of HIV, HBV, and HCV among patient who underwent cataract surgery in Rohilkhand area.

MATERIALS AND METHODS

This was a retrospective, cross-sectional hospital-based study done in the Department of Ophthalmology, Rohilkhand Medical College and Hospital, Bareilly, where all patients who underwent cataract surgery under district blindness control program, within a span of 6 months from October 2019 to March 2020 were included from Hospital Information System. A total of 550 cataract patients were studied and their data were collected from hospital record system. Approval was granted by the Institutional Ethical Committee and we strictly adhered to Declaration of Helsinki. Preoperatively, detailed ocular examination was done in all selected cataract patients and accordingly laboratory investigations were ordered. All patients who had denied any infection from HBV, HCV, and HIV nucleic acids were included in the study. All patients were made to sign informed consent for serological evaluation for HBV, HCV, and HIV. Other laboratory investigations included hemogram (CBC) and blood sugar random. HBV and HCV were tested with ELISA test kit. HIV was labeled as positive only when both the tests were reported positive in accordance with NACO guidelines.[11]

All positive cases who were newly diagnosed and came to know accidentally about their seropositivity with our investigations were included in the study. Post-test counseling was given to viral markers positive cases and referred to antiretroviral therapy center for registration and baseline investigations. To find the risk factor of infection, a questionnaire was given to all seropositive cases. The elicited risk factors included history of blood transfusion, unprotected sex with multiple partners, and receiving injections from unqualified local practitioners, history of previous surgery, tooth extraction, and having shaving done routinely from barber. The information recorded was kept confidential.

All cases with any of the above viral infection were considered as high risk for surgical supportive staff and surgeons. All high-risk subjects underwent minor outpatient procedure likewise lacrimal sac syringing at last using disposable syringing cannulas. Biometry was done with help of ultra-thin paper made of transparent polythene as an interface and after disinfection of tip. Disinfection of tonometry was done after every case. OT procedures followed universal health precautions as advocated by the WHO. Sharp instruments were handled with proper care to avoid cuts. Reusable items such as scissors and blade handles were kept separate and glutaraldehyde disinfection was done for appropriate time period. Thereafter, proper cleaning and double autoclaving were done. Biomedical wastes were disposed according to accepted standards. The details were recorded on pro forma and data were compiled and analyzed for age and sex mean values. Occupation of the subject was also emphasized upon. All patients who were selected for elective operation were included in the study.

DISCUSSION

India is currently among those countries who is harboring a huge seropositivity for HIV as well as HBV and HCV infection.[12-14] The presence of asymptomatic carriers in the community acts as a reservoir in the community and if we do not screen these infections before surgery then it increases the chances of horizontal transmission of the disease.[8,10,15] Ophthalmic surgeons are exposed to these viral infections through a variety of modes of contact such as lacrimal secretions in the form of tears, aqueous humor, and also by accidental needle stick injury.[7,16] Temel *et al*. and Koksal *et al*. have found in their study that 70% and 85% of HBsAg seropositive patients also showed positivity for HBsAg in their lacrimal secretions and aqueous humor by polymerase chain reaction (PCR), respectively.[17,18] Tsai *et al*. have reported a case of an symptomatic HBV patient where he has found positivity for HBV in their aqueous humor using PCR.[16] Kobayakawa *et al*. found in their study that 50% of patients who showed the presence of anti-HCV antibody in their blood also showed positivity for HCV in aqueous humor, which was further confirmed by PCR.[19] Many studies have found the presence of HIV viruses in tears, cornea, aqueous humor, conjunctiva, and retinal vascular endothelium. Han *et al*. have detected presence of HIV-1 viruses in tears of patient who were undergoing treatment with long-term highly active antiretroviral therapy.[20]

The present study [Figure 1] suggests the higher prevalence of HBV infection as compared with infection with HCV. This goes in agreement with other studies as done by Arif *et al*. who found a prevalence of 4.47% with HBsAg and 1.73% with anti-HCV in hospitalized patient. The prevalence of HIV in our study was 1.09% and this goes in agreement with other studies who have found similar results.[21-25]

In this study, it was found that the higher prevalence of HBV was found to be more in age group of 40–70 years whereas that of HCV infection, it was 49–60 years [Figure 2]. In the studies done by Naeem *et al*.,[26] the age group most commonly affected with HBV and HCV infection was 50–85 and 55–64 years, respectively, among patients undergoing cataract surgery.

The present study showed a higher rate of HBV and HCV infection among males as compared to females and this is in line with the other studies [Figure 3]. This higher frequency of HBV

and HCV infection among males (2.9% and 0.72%, respectively) in comparison to females (1.4% and 0.36%, respectively) could be due to the reason that more males come for testing and treatment in this area. Some authors have suggested that this could be due to the fact that males have more socialization outside in comparison to females and thus there is a greater chance of being infected.[27,28] Studies carried out by Arif *et al*., have also noted similar result of higher prevalence of HBV and HCV infection among males (6.4% and 2.7%, respectively) than females (4.9% and 1.9%, respectively) in patients planned for surgery.[22]

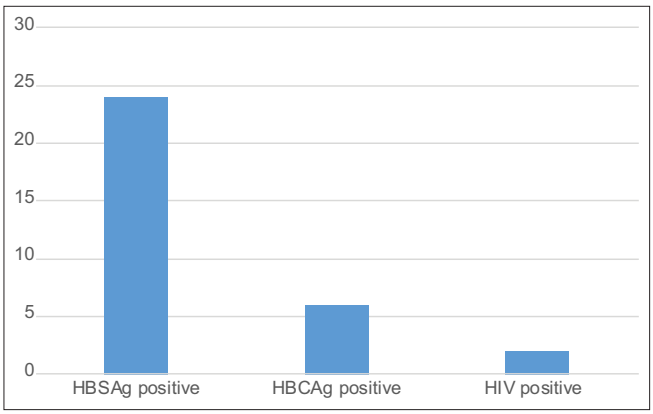

Figure 1: Number of patients positive for viral markers

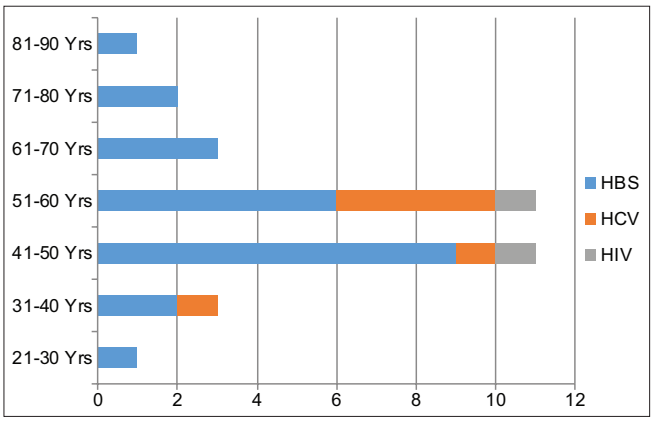

Figure 2: Frequency of positive viral serology in different age groups

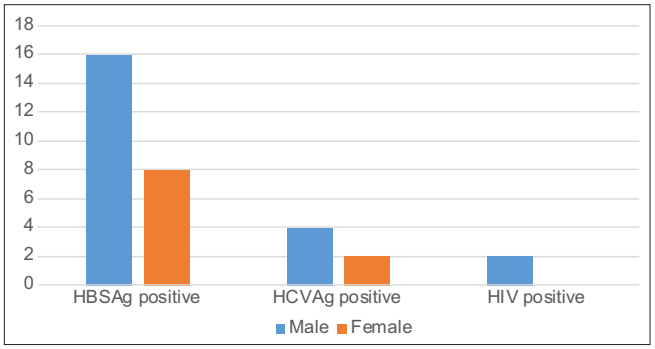

Figure 3: Frequency of positive serology in male and female patients

It's a matter of great concern and a stringent protocol need to be implemented to break the transmission of HBV, HCV, and HIV infection among health care workers and patients by horizontal mode of spread in a hospital setup. Lack of compulsory serological screening protocol before any ocular surgery was the main reasons for higher rate of transmission of infectious disease, thereby putting ophthalmologists and associated other health care workers and patients at higher risk of getting infected.

Limitations

One of the major limitations of this present study was that neither aqueous humor nor tears were screened for viral markers and this can be incorporated in further studies.

CONCLUSION

To stop the horizontal transmission of infection and make the surgery safe, we recommend compulsory screening for viral markers in all patients being planned for cataract surgery. However, in cases with positive serology for these viruses, surgery can be performed by following guidelines of universal precautions for infectious diseases.

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