

Universal screening versus universal precautions in ophthalmic surgery

An occupational blood exposure (OBE) in a medical setting is either a percutaneous injury (needlestick or cut with a used sharp medical device) or contact between a mucous membrane or nonintact skin and blood, tissue, or other body fluids.^[1,2] Human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) are the most common occupationally acquired infections in health-care workers (HCW) following OBE.^[1] The World Health Organization (WHO) estimated that each year, of the 35 million HCWs worldwide, 3 million experience OBE (2 million to HBV, 0.9 million to HCV, and 170,000 to HIV). These injuries result in 70,000 HBV infections, 15,000 HCV infections, and 500 HIV infections.^[1,2] Following OBE, the risk of infection varies depending 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.^[3] The absolute risk of seroconversion is small for HIV (0.3%) and higher for HCV (1.7%) and HBC (3.5%).^[1,3,4]

Ophthalmologists and paramedical ophthalmic professionals are prone to sustain needlestick injury (NSI) or blood splash. The incidence of NSI is about 100,000 per year in the United Kingdom and is about 10 folds in the United States of America.^[5] The ophthalmology operation theater is the second most common location for NSI, accounting for 17% in the United Kingdom.^[6] Use of ultra-sharp and short microsurgical instruments and sutures, working with high magnification, restricted visible surgical field while operating with a microscope, and suboptimal ambient illumination increase the relative risk of NSI in an ophthalmic surgical setting.^[5-7] About 8% of vitreoretinal surgeons have reported NSI during the procedure of intravitreal injection.^[8] Incidence of NSI in a tertiary care eye hospital in India was reported to be 0.07/1000 surgeries.^[7] Of 140 NSI reported over 5 years, ophthalmology subspecialty fellows in training were most frequently involved, followed by nursing staff and ophthalmology faculty.^[7] While NSIs are possibly underreported, blood splash is grossly underrecognized. Blood was detected on 61% of eye shields worn during oculoplastic surgeries.^[9] However, only 2% of blood splash were recognized intraoperatively by the surgical team.^[9] The problem, therefore, seems to be more prevalent than what we think it is.

In this context, a publication in this issue of Indian Journal of Ophthalmology highlighting the prevalence of HIV, HBV, and HCV infections in patients undergoing cataract surgery assumes significance.^[10] The study found that 5.9% of patients undergoing cataract surgery were seropositive for HIV (0.09%), HBV (1.8%), or HCV (4.0%).^[10] This brings us back to the often-debated controversy of Universal Precautions versus Universal Screening in the setting of elective surgeries.

Universal precautions have a rational basis and have helped develop guidelines to minimize OBE. Universal precautions suggested by Centers for Disease Control and Prevention include routine use barriers (gloves, gowns, masks, and goggles) when anticipating contact with blood or body fluids, immediate washing of hands and other skin surfaces after contact with blood or body fluids, careful handling and disposal of sharp instruments, and disposal of syringes or other sharp instruments routinely in "sharps" containers for proper disposal to prevent accidental injuries.^[11] Sensitization of HCWs, hospital managers and policy makers, education in strategies of universal precautions, prompt reporting of incidents, and prompt risk-stratified postexposure prophylaxis for HIV are an integral of the measures to minimize the risk.^[11] However, the maximum emphasis of universal precautions is on prevention of blood contact through barrier protection. The risk of infection acquisition is graver with NSI, where barrier precautions are ineffective. Standard barrier protection used in Western countries (polyethylene gown, body exhaust system, and enclosed sterile surgical helmet) are generally not available to surgical teams in developing countries.^[12] Unavailability of highly effective antiviral agents and vaccines for HCV and HIV, the high rate of undiagnosed patients compounds the risk of occupational infection for HCWs without optimal protection.^[12]

Universal screening for HIV, HBV, and HCV is a strong risk-reduction strategy from the perspective of HCWs and is a part of routine preoperative investigations in many centers.^[13] Such a strategy helps in (a) preventing transmission of infection from patient to HCWs, (b) taking adequate precautions in the form of enhanced personal protective equipment during surgery, (c) planning the type of anesthesia and sequence of the surgical list, (d) customizing intraoperative barrier protection of the surgical team and environmental decontamination following the procedure, (e) deciding if the procedure is necessary at all or not, based on individual perceptions about safety of the operating and anesthetic team and hospital management, (f) prompt initiation of postexposure prophylaxis without awaiting patient consent for testing, and (g) detecting unknown cases and management before the onset of AIDS/cirrhosis/liver carcinoma.^[13,14]

India has one of the largest reservoirs of undetected HIV, HBV, and HCV.^[12] Data from India suggests that about 0.36% of the population is HIV infected, 2.4%–15.9% are HBV infected, and 1.2% are HCV infected.^[13] With a population of about 1.2 billion, this equates to about 2.5 million HIV cases, at least 29 million HBV cases and 12 million HCV in India.^[13] It is conceded that the prevalence of 1 in 1000 in the general population justifies screening.^[15] Although the screening of HIV, HBV, and HCV may thus have epidemiological justification in India, what is debatable is the health economic justification.^[13] Also of concern is that the focus of universal screening is on prevention of infection transmission from the patient to HCWs rather than on case detection and subsequent care of the infected patients. Sensitivity and specificity of screening tests and "window period negativity" remain

the significant fallacies of universal screening.^[13] The National AIDS Control Organization mandated pre- and posttest counseling before HIV screening may be difficult to practice in an eye hospital.^[16]

Ahmed and Bhattacharya have recommended a three-tier strategy for preoperative screening: (1) universal screening for HIV, HBV, and HCV in resource-rich settings, (2) selective screening based on history and clinical examination in resource-limited settings, and (3) no screening or screening only in exceptional circumstances in resource-poor settings.^[13] For patients found seropositive on screening, standard handling guidelines are already in place.^[17] Considering the relatively high incidence of OBE in ophthalmic surgical setting, adoption of the recommended three-tier strategy seems logical. Barrier protection for the hands and protective eyewear in oculoplastic surgery, and universal precautions to minimize NSI should be applied in situations where universal screening is not practical. The development of formal Indian national guidelines for preoperative screening for HIV, HBV, and HCV and precautions specific to ophthalmic procedures seems timely, important and relevant.

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Access this article online	
Quick Response Code:	Website: www.ijo.in
	DOI: 10.4103/ijo.IJO_253_18

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Cite this article as: Honavar SG. Universal screening versus universal precautions in ophthalmic surgery. *Indian J Ophthalmol* 2018;66:355-6.