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# **Blood and Body Fluid exposure and risk to Health Care Workers**

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Blood and body fluid (BBF) exposure to health care workers (HCWs) and the infectious complications associated with it, is a global issue. It affects all categories of staff including clinicians, dental professionals and students both medical and nursing, laboratory workers, paramedics, domestics, porters, hospital volunteers and administrative staff. Exposure includes splash of BBF to the eyes, nasal and oral cavities, or contact with damaged skin and needle stick injuries.

These preventable exposures can lead to over twenty different blood borne infections but serious consequences are associated with Hepatitis B, C and HIV.<sup>1</sup> According to an estimate these exposures cause 1,000 infections in the US per year with the most common and devastating infections being Hepatitis B, C and HIV.<sup>2</sup> In 2002, the World Health Organization reported that globally 2.5% of HIV and 40% of Hepatitis B and C cases among HCWs were the result of occupational exposure.<sup>3</sup> In Pakistan an additional threat is the Congo Crimean Haemorrhagic Fever which is endemic in the North West of Pakistan with very high (up to 88%) mortality.

The risk of acquiring blood borne infections (BBI) from occupational exposures is dependent on the concentration of infectious virions in the implicated body fluid, the volume of infected material transferred, frequency of percutaneous, permucosal exposure to blood or body fluid, device visibly contaminated with the source patient's blood, depth of injury, procedures involving a needle placed directly in the patient's vein or artery and type of needle involved (hollow needles contain more blood therefore there will be a higher risk of transmission).

Hepatitis B virus infection is the major infectious hazard for health care personnel. In an unvaccinated person, the risk of HBV infection from single needle stick injury to HBV infected blood ranges from 6%-30% and depends on the HBeAg status of the source individual. After an exposure, the estimated risk for Hepatitis C virus transmission (HCV) is up to 3% and for HIV is 0.03%. Indeed it is important to note that the lower risk of HCV transmission compared with HBV is offset by the greater risk of chronic infection.<sup>4</sup> Eighty percent of all those infected will develop chronic HCV infection leading to further complications.

In Pakistan, due to non-existing infrastructure of

surveillance at national level no data is available to have an estimate of possible transmission of BBI among health providers. The Meta analysis of published data shows that the prevalence of Hepatitis B infection in the general population is 3-4% and C is 5-6% which is invariably much higher in comparison with US population where the prevalence of both the infections are very low. Therefore, it is easy to speculate that HCWs in this region are at higher risk for HBV and HCV transmission. Consequently, there is higher morbidity and mortality than US or any other developed country where prevalence of both the infections is very low.

Additional factors which further enhance the risk of exposure and transmission are virtual non-existing infection control activities in various institutes mainly due to the lack of training and awareness amongst HCWs as well as administrators. In many training institutes mouth pipetting, sharing of instruments, reuse of syringes and sutures are still in practice. HCWs engaged in washing of used glass ware and cleaning of equipment are not familiar with personal protective ware and work with bare hands. Additionally, disposal of clinical waste is not appropriate which further aggravates the frequency of needle stick injuries to staff engaged in final disposal.

By and large, medical colleges and allied health institutes do not include infection control and occupational hazards in their curricula in this country. Moreover, infection control committee and occupational departments do not exist in the majority of institutes to look after, give advice keep records and complete follow-ups for any HCWs who had the exposure.

To lower the occupational risk amongst health care providers, a multifaceted approach is needed, including government support, revision of curricula and addition of infection control in the syllabus by PMDC and other educational bodies. Department of health, federal as well as provincial should take the lead and direct individual health care facilities to develop and implement infection control programs. Administrative support is mandatory and plays a crucial role in the implementation of any program in the hospital.

In 1987 the Center for Disease Control (CDC), developed universal precautions aimed to protect both HCWs and patients from infection with blood-borne

pathogens in health care settings.<sup>5</sup> Subsequently, occupational safety and health administration (OSHA), issued the blood-borne pathogens standard, which recommends; hand disinfection after contact with the patients, HBV vaccination for all HCW's, development of written protocol plans, use of safe syringes and devices, work practice controls to reduce exposures and annual training. As a result of implementation of standard precautions and increased immunization, the estimated annual number of newly infected HCWs in the US declined from >10, 000 in 1983 to < 400 in 2001(CDC unpublished data).

Finally, it is also important to understand that infection control activities are cost effective. Initially they require financial assistance but on long-term basis they save money as well as reduce morbidity and mortality.

In conclusion, health care workers are crucial in the health care system. They are at higher risk for preventable life threatening occupational infections. Given the serious even fatal consequences of sharps injuries and the limited effectiveness of post-exposure therapies, it is mandatory that measures to prevent sharps injuries from occurring

should strictly be adhered to. Therefore, it is imperative to implement and follow these time tested and proven policies at national and individual levels. Initial effort should be focused on altering the behavior of HCWs. Subsequent efforts to prevent sharps injuries include the introduction of protective barriers, engineering of safer devices, substitution of non-invasive procedures and implementation of administrative controls.

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