

Chapter 15

Prevention of Blood-Borne Virus Infections in Patients and Personnel

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Key points

- Many pathogens can be transmitted efficiently through blood exposure:
- Bacteria including streptococci, staphylococci, and syphilis
- Viruses including hepatitis, hemorrhagic fevers, HIV, herpes and dengue
- Fungi including blastomyces and cryptococci
- Protozoa including malaria and toxoplasmosis
- Risk for patients is reduced by using only sterile injection equipment and solutions and only using injections when necessary
- Risk for HCWs is reduced through a combination of barrier precautions, safe sharps practices, post-exposure prophylaxis and immunization for vaccine preventable diseases.

Introduction

For more than a century, transmission of blood-borne (BB) infectious agents has been recognized as an important risk for patients and personnel. Health care workers (HCW) acquire BB infections as a result of lacerations, punctures and non-intact skin exposures to blood or body fluids of infected patients. Patients acquire BB infections from improperly sterilized injection equipment, unsterile injection fluids, and exposure to the blood of infected HCWs during invasive procedures.

Many studies have shown that patient and HCW risk for exposure can be reduced substantially at relatively low cost; risk for disease following exposure can also be reduced, although at higher cost. There are few infection prevention and control opportunities that would result in greater improvement of global health than reducing frequency of BB diseases.

Risk for BB infections in patients

Injections received for health care have been viewed as “safe” when compared to illicit injection drug use. However, this view is certainly incorrect: large epidemics of hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) infections have been reported as a result of health care injections. Most are probably never recognized or reported.

The Safe Injection Global Network (SIGN) ¹ estimated in the 2000 Global Burden of Disease study that approximately 16 billion injections are performed annually in the world. Many are unnecessary as oral medication would be better. In addition, in settings with limited resources, more than half of all injections are given with syringes reused without sterilisation or high-level disinfection. Shortage of supplies leads to ineffective strategies such as using a single syringe repeatedly for a single day, for a particular drug or family.

Studies in China, Pakistan, India, Moldova, Romania, Egypt, some African nations and other countries have reported the association between unsterile injections and subsequent HBV, HCV and HIV infection to be very high. Using a complex model, SIGN estimated that in 2000, contaminated injections caused 21 million HBV infections, two

million HCV infections and 260,000 HIV infections, accounting for 32%, 40% and 5% respectively of new infections.

Reducing risk for BB infections in patients

Since the cost of sterile injection equipment and solutions is often a problem, no effort to reduce risk will be effective without first reducing frequency of unnecessary injections. This will certainly require changing the injection culture among healthcare personnel and changing both education and culture among patients and their families. WHO proposes that “national strategies for the safe and appropriate use of injections address behaviour change among health care workers and patients, provision of equipment and supplies and sharps waste management. Such initiatives should not constitute separate programs but should be integrated with other activities, including HIV prevention and care, essential medicines, immunization and health system management.”²

In general, a successful program should include:

1. Reduce unnecessary injections by:
 - a) Developing a policy in the health care facility on appropriate drugs and circumstances for injections and publicize it.
 - b) Carry out public campaigns in schools and the media to reduce injections.
2. Educate HCWs, patients and the public about injection risk by
 - a) Developing teaching materials (posters, lectures) about injection risk and the importance of reducing injection frequency.
 - b) Enlisting influential institutions, such as churches, hospitals, and government officials, to campaign against unnecessary injections.
3. Eliminate use of unsterile needles, syringes, and solutions for injections.

Risk for BB infections in health care workers

Because of potential exposure to HBV in patient's blood, immunisation is recommended for all HCWs who have exposure to blood and body fluids. However, this does not reduce the need to observe safe practices to reduce needlestick injuries and other blood exposures.

For example, only re-cap disposable needles using a one-handed technique. Place used sharps in puncture-proof containers before reprocessing or disposal. Use no touch techniques (e.g., forceps) to handle blood or blood contaminated material. Wear gloves for handling sharp items; one layer of latex reduces the blood inoculum significantly.³

Establish a procedure for reporting blood exposures to the Occupational Health Department and the appropriate management actions to be taken. Surveillance for occupational blood exposures can provide data for prevention efforts. Routine accident reports may not provide accurate or sufficient information to guide these prevention strategies; therefore, focused studies may be required.⁴ Studies in departments where the risk for occupational blood exposures is high have shown that personnel were able to reduce the frequency of exposure more than half by changing practices and increasing barrier precautions.⁵ Post-exposure management recommendations for HIV change frequently and are beyond the scope of this chapter, but they are somewhat successful and healthcare facilities should have appropriate policies in place.

Reducing risk for BB infections in health care workers

A HCW risk assessment found that risk of exposure was highest when sharp tools were involved, when HCWs were inexperienced at the task, or when the patient was unable to be fully cooperative. In addition, risk of exposure is higher if HCWs anticipate difficulty managing a particular situation.

Some risks to health care workers can be eliminated by using devices that minimize puncture opportunities; many others can be reduced by infection prevention programs that mandate appropriate use of barrier precautions and safe work practices.

References and Further Reading

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