
1. Introduction

1.1 Important occupational health problems in the health setting

Accidental needlestick injury (ANI) is one of the most important occupational health issues among health workers.^{1, 2, 3} A wide range of infections can be contracted through ANI, in fact, almost any blood-borne pathogen may occur in the community, at large or within health care organisations and can affect both the worker and patients through ANI. However, only those infectious diseases that occur frequently in the health care setting or are most important to personnel will be the focus of this work.

Part One

Review of Blood-Borne Occupational Health Problems in Hospitals

The important infectious diseases that can be contracted by health care workers through ANI include Hepatitis B, Hepatitis C and Human Immunodeficiency Virus.

1.2 Blood-borne occupational health problems and risks

In 1994, a study conducted in Kangwane, South Africa showed 14.8% of males and 4.8% of females positive for hepatitis B virus surface antigen.² An estimated 1000 health-care personnel were believed to have become infected with Hepatitis B virus in 1994 in the United States. This showed a decline of about 90% since 1965, and is attributable to the use of vaccine and adherence to other preventive measures like "standard precautions".³

1. Introduction

1.1 Important occupational health problems in the health setting

Accidental needlestick injury (ANI) is one of the most important occupational health issues among health workers.^{1, 2, 3} A wide range of infections can be contracted through ANI. In fact, almost any blood-borne pathogen may occur in the community at large or within health care organisations and can affect both personnel and patients through ANI. However, only those infectious diseases that occur frequently in the health care setting or are most important to personnel will be the focus of this work.

The important infectious diseases that can be contracted by health personnel through ANI include Hepatitis B, Hepatitis C and Human Immunodeficiency Virus.⁴

1.2 Blood-borne occupational health problems and risks

In 1994, a study conducted in Kangwane, South Africa showed 14.6% of males and 4.6% of females positive for hepatitis B virus surface antigen.² An estimated 1000 health care personnel were believed to have become infected with Hepatitis B virus in 1994 in the United States. This showed a decline of about 90% since 1985, and is attributable to the use of vaccine and adherence to other preventive measures like "standard precautions".⁵

The rate of sero-conversion after percutaneous exposure to blood or serum from Hepatitis B surface antigen positive patients has been quoted as between 12% and 17%, even after passive immunization of recipient with immune serum globulins.⁶ Active Hepatitis B virus immunization will improve this outlook, however, it has been shown that 4% of individuals do not acquire immunity after the vaccination⁷. After Hepatitis B infection, 90% of patients can expect recovery, the remainder will become chronic carriers. About 50% of patients with chronic hepatitis will eventually die of complications of liver cirrhosis or hepatocellular carcinoma.⁸

Hepatitis C virus (HCV) is the aetiological agent in most cases of parenterally transmitted Non A, Non B Hepatitis. In a follow-up study of health care personnel who sustained percutaneous exposures to blood from anti-HCV seropositive patients, the rate of anti-HCV sero-conversion averaged 1.8% (range 0% to 7%)⁹. Studies using HCV RNA polymerase chain reaction methods to measure HCV infection show rate of transmission of up to 10%.^{10, 11} About 50% of patients with acute hepatitis C will develop chronic hepatitis.

A study in South Africa showed positivity of Anti-Hepatitis C in 1.8% of patients with sexually transmitted diseases, 0.9% of blood donors and 3.3% in asymptomatic lower-class volunteers.¹²

The high prevalence of these blood-borne infections in the community is a pointer to the much higher prevalence among hospitalised patients to which health workers are exposed to in health care institutions.

Nosocomial HIV transmission occurring after ANI has become one of the most visible concerns of health workers. According to prospective studies of health care personnel percutaneously exposed to HIV- infected blood, the average risk for HIV infection has been estimated to be 0.3%.^{3, 13} Factors such as prevalence of infection among patients, the risk of infection transmission after exposure, and the frequency and nature of exposures determine health care personnel's risk of infection after ANI.¹⁴ For parenteral exposure per se, the risk ranges from 1,3 per 1000 to 3,9 per 1000.¹⁵

The incidence of AIDS apparently acquired after occupational contact with body fluid is small in comparison with the case of hepatitis B acquired this way. This is also true of health care workers transmitting the infection to patients.¹⁶ The main problem with HIV in this regard is that it has a very high prevalence rate of 22% in South Africa¹⁷, and is a fatal disease, thus explaining why it receives a lot more attention and publicity.

2. Incidence of needlestick injuries

In a cross-sectional survey of a random sample of Health Care Workers in University Hospital and clinics in Ile-Ife, Nigeria, needlestick accidents during the

previous year were reported by 27% of 474 health care workers, including 100% of dentists, 81% of surgeons, 32% of non-surgical Physicians and 31% of nursing staff. The rate of injury per person per year was 2,3 for surgeons and dentists.¹⁸ Another study done in 2001 among interns in Chris Hani Baragwanath and Johannesburg Hospitals showed that 33% had accidental percutaneous exposure to HIV-infected blood. 64% of percutaneous exposures to HIV-infected patients were reported.¹⁹

Epidemiological studies in the United States have shown that needlestick injury is the leading cause of all work-related injuries and illness in nurses.¹⁵

3. Cost of accidental needlestick injury

Accidental needlestick injury has a huge financial cost, which emanates from the prevention and treatment of diseases that could possibly result. Data from the study of needlestick-prevention devices in 10 New York State hospitals enabled application of cost-effectiveness analysis techniques for determining relative benefits of various safety interventions. Data aggregated from participating institutions, estimates the expected cost of needlestick injury to be \$363 (about R3, 000.00 South African, at August 2001 exchange rate of R8.30 : US\$1.00).¹¹

4. Conclusion

South Africa has a very high prevalence of HIV and Hepatitis B.^{2, 17} This fact ought to make health service providers and managers astute¹² with handling of personnel health service infection control. Personnel shortages and lack of capacity at the lower levels of care is an obvious problem that could hamper implementation of effective measures at the district and regional level facilities.

Management and control of personnel exposures to body fluid of patients with its attendant risks require accurate data. It is standard practice for all cases of needlestick injuries to be reported to a responsible officer in health facilities in South Africa, however, the reported incidences is believed to be for various reasons, significantly less than actual occurrence.

Attempts are often made to describe needlestick injuries in facilities in South Africa and Southern Africa where the HIV pandemic is severe, but these efforts have concentrated mainly on analysis of reported incidences of needlestick injuries.

The seriousness of accidental needlestick injuries both in terms of occurrence and risk of infection makes it an important factor, and a useful outcome of personnel health service infection control policies and practices. This study will describe the incidence of needlestick injuries and other body fluid exposures, both reported and unreported, within a high HIV prevalence community of South Africa.