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Original article

Percutaneous Exposure Incidents Among Vietnamese Hospital Personnel and the Impact of a Prevention Program

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Abstract

A reporting and management system of percutaneous occupational exposures was established in a Vietnamese tertiary hospital to encourage healthcare personnel (HP) to report their occupational exposures and use safety practices. The comprehensive occupational exposure prevention program involved the supply of protective barrier equipment and needle disposal units as well as continuing educational programs for all hospital staff on the use of these equipment. Despite increasing number of HIV positive patients being admitted to the hospital, the programme was successful in preventing HIV occupational exposures. Dedicating resources to occupational exposure prevention and HP safety should be a priority for clinical care and treatment programs in Vietnam.

Introduction

Healthcare personnel have a risk of exposure to bloodborne pathogens.[1] However, the incidence of occupational percutaneous exposures to HP is unknown in Vietnam. The organisation of a reporting system for percutaneous occupational exposures in HP is still a new concept in the country. Follow-up of these exposures and setting up the appropriate management and prevention programs thus are necessary.

Cho Ray hospital is a 1705-bed tertiary care referral university centre for Southern Vietnam and the hospital's bed occupancy rate in 2006 was 144%. Approximately 300 emergency patients are admitted and 3000 outpatients are consulted per day. The number of HIV-infected patients admitted to Cho Ray hospital has increased rapidly, by six-fold in 2006 compared to 1997 and parallels the expansion of the HIV epidemic in southern Vietnam. However, there were no established protocols for occupational exposures. Since the Infection Control Department of Cho Ray hospital was established in 2000, all of HIV exposed HPs have been reported, treated, and followed up completely.

Challenges

Due to the increase of HIV infection nowadays, the number of HIV patients who are admitted to the hospital is increasing. The patients with HIV who are admitted to the hospital mostly enter with traffic accidents or other diseases, but no clinical signs of suspected HIV infection and their HIV infection was found accidentally by scanning tests. Almost all of them required urgent manipulations and needed invasive procedures such as intubation, infusion, and operation.[2] These factors contributed to increasing risks of transmission of HIV as well as hepatitis viruses to HPs.

Despite these high risks, infection control is not well practiced among HPs. There is a wide gap between knowledge and behaviour in infection control practices among the HPs. Application of universal precautions has been limited.[3] The working conditions are unsafe because the hospital suffers from overcrowding and lack of facilities.

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Actions

Since June, 2001, a prevention program has been conducted, including training, setting up the system of reporting and supplying appropriate personal protective equipment (PPE) for HP. The training program includes ongoing training courses (formal and informal) for all staff, publication of a guideline to prevent exposure to HIV, HBV and HCV for HP, and distributing pamphlets to educate staff about the prevention of exposure to blood borne pathogens. Provision of sharps disposal containers that meet optimal performance criteria and sufficient PPE are also available continuously on units and in departments. HBV vaccination programme was also implemented in 2004. Reporting system for occupational exposures was set up and the treatment procedures after exposures also established. (Figure 1) All HIV exposed patients were given post exposure prevention within 2 hours after exposure with 2 drug basic regimen and followed-up in the 6 month period per standard guideline.[4] Non HIV exposed HPs were tested for HBV and vaccinated if they had no antibody.

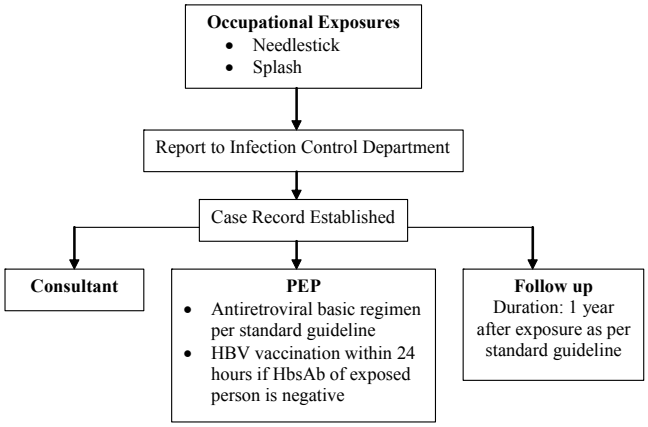

Figure 1: Flow chart of reporting occupational exposures

Results

From February, 2000 to December, 2006, the total number of occupationally exposed HP was 195 cases, of which 156 cases (80%) were percutaneous exposures including needlesticks (96%) or other sharps-related injuries (4%). Source patients with positive HIV status were reported in 30 cases (19.2%), with negative or unknown HIV status in 126 cases (80.8%).

Nurses were the most commonly affected members 60 (38.5%), followed by cleaners 35 (22.4%) and surgeons 25 (16%), (Table 1). Most exposed HP worked at surgery department (39%) and emergency department (10.9%), (Table 2). Injuries occurred during waste collecting (22.4%), suturing (20.5%), recapping or removing needles (18%) and giving transfusion (8.3%), (Table 3). The most common injuries were from hollow-bore needles (57.1%), especially needles for blood taking (Table 4). The most common reason for accidents was unsafe practice (61,5%), non-compliance with standard precautions (26,9%) and insufficient use of PPE (11,5%). In 30 cases of HP who were exposed to HIV positive patients, 65.4% of HP did not know patient status before accident.

Table 1: Distribution of occupation of HPs with percutaneous exposures

	Total N = 156	HIV + N=30	HIV-/unknown N=126
Surgeon	25 (16.0)	14 (46.7)	11 (8.7)
Medical physician	14 (9.0)	3 (10.0)	11 (8.7)
Nurses	60 (38.5)	11 (36.7)	49 (38.9)
Technician	15 (9.6)	1 (3.3)	14 (11.1)
Cleaners	35 (22.4)	0 (0.0)	35 (27.8)
Medical Students (undergrad+postgrad)	7 (4.5)	1 (3.3)	6 (4.8)

Data are presented as number of exposures (%)

Table 2: Distribution of wards/department of HPs with percutaneous exposures

	Total N = 156	HIV + N=30	HIV-/unknown N=126
Surgery Departments	61 (39.1)	14 (46.7)	47 (36.5)
Internal Medicine Departments	35 (22.4)	6 (20.0)	29 (23.0)
Emergency, Out-patient	17 (10.9)	5 (16.7)	12 (9.5)
Operation theatre	9 (5.8)	2 (6.7)	7 (5.6)
ICU	8 (5.1)	1 (3.3)	7 (5.6)
Lab	12 (7.7)	2 (6.7)	11 (8.7)
Cleaner department	12 (7.7)	0 (0.0)	12 (9.5)
Others	2 (1.3)	0 (0.0)	2 (1.6)

Data are presented as number of exposures (%)

Table 3: Distribution of percutaneous occupational exposures by procedures

	Total N = 156	HIV + N=30	HIV-/unknown N=126
Operations	32 (20.5)	15 (50.0)	17 (13.5)
Recapping needles	11 (7.1)	2 (6.7)	9 (7.1)
Infusions	13 (8.3)	1 (3.3)	12 (9.5)
Injection	8 (5.1)	2 (6.7)	6 (4.8)
Blood withdrawing	11 (7.1)	3 (10.0)	8 (6.4)
Needle withdrawing	17 (10.9)	5 (17.0)	12 (9.5)
Waste collecting	35 (22.4)	1 (3.3)	34 (26.9)
Cleaning	20 (12.8)	0 (0.0)	20 (15.9)
Others	9 (5.8)	1 (3.3)	8 (6.4)

Data are presented as number of exposures (%)

There was no case of sero-conversion with HIV, but two cases had sero-conversion with HBV, and one with HCV. Since starting the HBV vaccination program, no case of sero-conversion with HBV has been detected. After the prevention program, the incidence of exposed HP to HIV was reduced significantly although the admissions of patients with HIV increased. Incidence was 0.7/month in 2000, then 1.3/month during the first 6 months of 2001, reduced to 0.08/month in 2002, 0.17/month in 2004 and 0.25/month in 2006 (P=0.007). Notably, the incidence of exposed HP reduced markedly after each episode of prevention (Figure 2). In addition, the programme supplied HPs with a better understanding of HIV transmission and provided further psychological support in private consultation, which helped to reduce psychological stress following HIV exposures. As a consequence, the number of HP reporting needlesticks from HIV patients increased.

Table 4: Distribution of percutaneous occupational exposures by devices

	Total N = 156	HIV + N=30	HIV-/unknown N=126
Hollow needles for injection	62 (40.4)	8 (26.7)	54 (42.9)
Hollow needles for blood withdrawing	14 (8.9)	2 (6.7)	12 (9.5)
Suture needles	31 (20.0)	14 (46.7)	17 (13.5)
IV cannula	19 (12.3)	1 (3.3)	18 (14.3)
Butterfly needles	12 (7.8)	2 (6.7)	10 (7.9)
Scalpels	6 (3.9)	2 (6.7)	4 (3.2)
Others	12 (7.8)	1 (3.3)	11 (8.7)

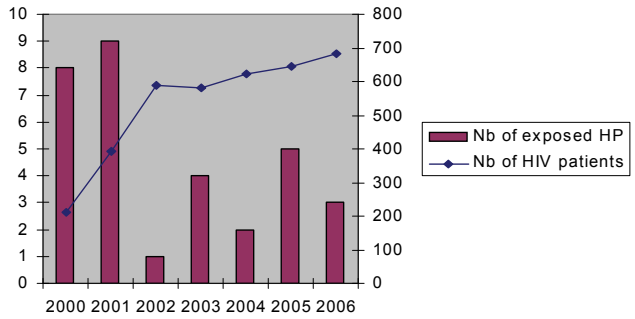

Figure 2: Number of HIV exposed HPs by years and impact of the intervention program

Conclusion

HP have a high risk of percutaneous exposures. Improving safe working environment in Vietnam should focus on the application of safe practice, especially safe injection technique and the appropriate use of PPE. Prevention programs including training, management, supplying sufficient PPE and reporting have been shown to be effective in preventing occupational exposures, but need to be maintained continuously. The majority of our HIV percutaneous exposures occurred during surgical and emergency procedures and waste collection. Surveillance data should be used to guide ongoing and targeted training programs for high-risk procedures and settings.

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