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## **RISK OF NEEDLE STICK INJURIES IN HEALTH CARE WORKERS: BAD HABITS (RECAPPING NEEDLES) LAST LONG**

### **RYZIKO EKSPOZYCJI PRACOWNIKÓW OPIEKI MEDYCZNEJ NA DROBNOUSTROJE PRZENOSZONE PRZEZ KREW ZWIĘKSZAJĄ UTRZYMUJĄCE SIĘ ZŁE PRYZYWCZAJENIA**

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#### STRESZCZENIE

W celu poznania wiedzy pielęgniarek dotyczącej ryzyka zakażenia wirusami zapalenia wątroby typu B i C oraz ludzkim wirusem upośledzenia odporności podczas wykonywania pracy zawodowej rozdano przygotowane przez autorów anonimowe kwestionariusze w 2008 r. Okazało się, iż 64% ankietowanych od czasu do czasu zakłada plastikową nasadkę na używaną przed chwilą igłę do iniekcji, mimo znajomości procedur obowiązujących na oddziale. Pierwszym krokiem mającym na celu zapobieganie zakłuciom powinna być eliminacja tej praktyki poprzez edukację i wygodny dostęp do bezpiecznych pojemników do wyrzucania używanych ostrych narzędzi.

**Słowa kluczowe:** *HIV, HCV, HBV, ekspozycja zawodowa*

#### ABSTRACT

In order to assess the nurses' knowledge concerning the risk of hepatitis B and C viruses or human immunodeficiency virus infection while performing their professional duties, an anonymous questionnaire developed by the authors was distributed in 2008. Surprisingly 64% respondents occasionally recapping needles after injections, although they know the procedures which are obligatory at the ward. The first step in preventing percutaneous injuries should focus on efforts to eliminate the practice of recapping needles, though education and convenient placement of puncture-resistant containers for the disposal of used sharps.

**Key words:** *HIV, HCV, HBV, occupational exposure*

#### INTRODUCTION

Exposure to blood-borne pathogens poses a serious risk to health care workers (HCWs). In the health care setting, blood-borne pathogen transmission occurs predominantly by percutaneous or mucosal exposure of workers to the blood or body fluids of infected patients. Occupational exposures that may result in human immunodeficiency virus (HIV), hepatitis B virus (HBV), or hepatitis C virus (HCV) transmission include needlestick and other sharps injuries, direct inoculation of virus into cutaneous scratches, skin lesions, abrasions and inoculation of virus onto mucosal surfaces of the eyes, nose, or mouth through accidental splashes.

Prospective studies of HCWs have estimated that the average risk for HIV transmission after a percutaneous exposure to HIV-infected blood is approximately 0,3% (95% confidence interval = 0,2 to 0,5%) and 0,09% after a mucous membrane exposure (95% confidence interval = 0,006 to 0,5%), (1). The risk for HIV infection exceeds 0,3% for percutaneous injuries

involving a larger volume of blood and/or higher titer of HIV in the blood (2). One of the most common modes of the HBV transmission in the health care setting is an unintentional injury of an HCW from a needle contaminated with HBsAg-positive blood from an infected patient, and the risk of transmission after a needlestick exposure to a nonimmune person is at least 30% if the source patient is HBeAg positive but less than 6% if the patient is HBeAg negative (2). Average incidence of anti-HCV seroconversion after a needlestick or sharps from a known anti-HCV-positive source patient is 1,8% (2).

Last year participants of the discussion in Journal of Hospital Infections stressed that the USA and many European countries introduce guidelines which require from all healthcare facilities to purchase and provide needle protective devices, such as needle-free intravenous access systems, safety needles and safety peripheral vascular canulas (3). However, in many developed countries, including Poland, conventional devices (CD) are still used. Binding in many counties, also in Poland, universal precautions comprise among others minimal

manual manipulation of sharp instruments and device and disposal of these items in puncture-resistant containers.

Nurses are the group of HCWs who are at the greatest risk of being injured with a needle with lumen which results in a risk of infection with hepatitis B virus (HBV), hepatitis C virus (HCV) or human immunodeficiency virus (HIV).

## MATERIAL AND METHODS

In order to assess the nurses' knowledge concerning the risk of HBV, HCV or HIV infection while performing their professional duties, an anonymous questionnaire developed by the authors was distributed in 2008. Each from 37 subjects was asked to complete the questionnaire independently. All nurses employed at the same Neurology Ward of the Voivodeship Specialist Hospital in Białystok agreed to participate in the study and answered the questionnaire. At the beginning of our study the purpose of the study was explained to the respondents, who were assured about preserving the confidentiality. Data analysis was performed with Statistica 7,1 (StatSoft).

## RESULTS

Answers to questions concerning knowledge about the risk of infection with HBV, HCV and HIV at work are presented in Table 1. Less than a half of the respondents (18 – 49%) knew that the average risk of HIV infection due to a prick or cut with a sharp tool with a HIV-infected blood on it is 0,3%, but 7 respondents (19%) believed the risk was 10 or 100 times higher and 12 (32%) did not know the answer.

64% respondents occasionally recapping needles after injections, although they know the procedures which are obligatory at the ward.

## DISCUSSION

Data provided by the Central Register of Occupational Diseases in Poland indicates that among 314 new cases of occupational diseases in health care employees in 2005, HBV and HCV represented 42,3% of all cases (4). No cases of health care employees getting infected with at work have been reported.

The majority of the respondents (85%) know that the HBV infection risk is higher than HIV but fear related to HIV positive patients is bigger than in the case of HBV-infected subject. Ganczak and Szych made a research in 18 hospitals in Szczecin, Poland and found that a high or moderate degree of fear of acquiring HIV at work was reported by 95,3% of nurses (5). During courses for nursing students, a fear of HIV infection during performing professional duties is expressed often, while HCV and HBV (majority of students and employees are vaccinated) or other bloodborne viruses do not cause such emotions.

78% of nurses think that an HBV, HCV, HIV-positive person is obliged to inform HCWs about the infection. Only 22% examined was absolutely convinced, that they know enough about infections prophylaxis in the case of exposure to blood.

It is surprising that 64% respondents occasionally recapping needles after injections, although they know the procedures which are obligatory at the ward. This rate is much higher than the one found among nurses employed in other countries in the European Union. For instance, at a British hospital it was only 4.2%

Table I. The participating nurses' knowledge about the risk of occupational HBV, HCV or HIV infection  
Tabela I. Wiedza pielęgniarek o ryzyku zawodowych zakażeń HBV, HCV i HIV

	Definitely yes n (%)	Some-what yes n (%)	Definitely no n (%)	Some-what no n (%)	Undecided n (%)
Is the HBV infection risk higher than HIV?	21 (57)	10 (27)	4 (11)	0 (0)	2 (5)
Is an HBV, HCV, HIV-positive person obliged to inform a nurse about the infection?	27 (73)	2 (5)	2 (5)	5 (14)	1 (3)
You are sometimes recapping needles after injections?	5 (14)	15 (40)	10 (27)	7 (19)	0 (0)
Do you know enough about infections prophylaxis in the case of exposure to blood?	8 (22)	19 (51)	10 (27)	0 (0)	0 (0)
Do you know enough about how to prevent HBV, HCV and HIV infections in your work?	3 (8)	15 (40)	14 (38)	4 (11)	1 (3)
Would you know how to reduce the infection risk, if you were injured with a needle used for injecting a HIV-seropositive person?	10 (27)	17 (46)	7 (19)	3 (1)	2 (5)
Would you be afraid to take care of a HIV-positive person?	4 (11)	7 (19)	19 (51)	3 (8)	4 (11)
Would you be afraid to take care of a HBV-positive person?	0 (0)	10 (27)	19 (52)	6 (16)	2 (5)

(6). This rate is much higher than in other hospitals in Poland. Leszczyszyn-Pynka et al. from Szczecin report that recapping a needle was the cause of exposure to blood-borne viruses only in 6,9% accidents (7).

Currently, Polish hospitals do not routinely offer education about bloodborne pathogens to personnel. Education is usually a one-time or infrequent event, and attendance is voluntary. Regulations for such education are lacking, and there is a shortage of licensed medical staff and facilities who can provide it. Education is provided, in part, by the National AIDS Center and the Health Promotion departments of the sanitary-epidemiological stations and by educational institutions (such as Medical Universities and their epidemiology or infectious diseases departments), although there is no coordination or cooperation between these entities and hospitals (8).

The first step in preventing percutaneous injuries should focus on efforts to eliminate the practice of recapping needles, though education and convenient placement of puncture-resistant containers for the disposal of used sharps (9).

Our study has obvious limitations. The presented results were obtained from a small group of nurses thus cannot generalise to assess attitudes of all nurses. However, the study included all nurses employed at the same ward and it revealed insufficient knowledge and high level of fear, related mainly to HIV. Rationalising this fear, striving to change bad and risky habits are urgently needed, before safety devices are generally available.

## CONCLUSIONS

This study highlights the urgent need to implement a programme to improve standard precaution adherence among nurses. Greater adherence to standard precautions will also reduce the risk of occupational exposure to blood borne infections.

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