

NEEDLESTICK INJURIES IN NURSES – THE POZNAŃ STUDY

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Abstract

Objectives: Needlestick injuries in healthcare workers are common. They are one of the main ways of transmitting large numbers of pathogenic micro-organisms in healthcare institutions. The aim of this study was to estimate the incidence and circumstances of needlestick injuries in a selected population of nurses from the city of Poznań and the Wielkopolskie province. **Materials and Methods:** A questionnaire was filled in by 232 active nurses with secondary education, studying externally at the Medical University in Poznań. The sample was representative of nursing specialisations and workplaces of nurses in Poznań and the Wielkopolskie province. It comprised of nurses aged 22–51 years (mean, 35 years) and with work experience of 2–31 years (mean, 13 years). The workplaces of the study group were fairly diverse, but the great majority of nurses were employed in inpatient care, working in shifts (166 people). **Results:** The probability of needlestick injuries per year equals 28.0%. Accidents of this kind were most common among nurses working in surgical wards, operating rooms, emergency medical care, GP surgeries and dialysis units. There were significant differences in the incidence of needlestick injuries between GP surgeries (statistically more common) on the one hand, and surgical wards, non-surgical wards and operating rooms on the other. Moreover, accidents in operating rooms and surgical wards were significantly more common compared to non-surgical wards. Instruments contaminated with infectious material accounted for 73.8% of the injuries in the study group of nurses. They were usually injection needles. Injuries from sterile needles, clean scalpels and contaminated scalpels were much less common. In the vast majority of cases, injuries were self-inflicted, and much less frequently caused by patients or colleagues. Most of these accidents happened during an attempt to remove a needle from a syringe, and much less while trying to place a used needle in a full medical waste container. In almost half of the cases (44.9%), the accidents occurred between the second and the fourth hour of the shift, which was probably due to a typically heavy workload during those hours, particularly on a morning shift. In the great majority of cases (84%), the nurses were wearing protective gloves at the time of accidents. **Conclusions:** The probability of a needlestick injury in the study group per year was 28.0%. Accidents of this kind were most common in nurses working in dialysis units, emergency medical care, GP surgeries, surgical wards, and operating rooms. Occupational sharps injuries were most often caused by a contaminated injection. The injuries were self-inflicted in the vast majority of cases. The most common cause of injuries from needles was an improper handling of syringes and needles after injections (removing a needle from a syringe or placing the needle in a full container for medical waste).

Key words:

Nurses, Needlestick, Infectious disease, Bloodborne pathogens

INTRODUCTION

Needlestick injuries in healthcare workers are common. They are one of the main ways of transmitting large numbers of pathogenic micro-organisms in healthcare institutions. According to Polish law, such incidents, if followed by the symptoms of infectious disease, meet all the crite-

ria of accidents at work (they are sudden, work-related, caused by external factors, and result in bodily harm, illness or death of an employee) [1]. The high incidence of such accidents, together with the transmission risk characteristic of a given pathogen and the incidence of a given micro-organism in patients are the primary risk factors for

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bloodborne infections [2]. A number of publications give statistics of such incidents and their risk factors [3–10]. Also in Poland, a few reports concerning this type of risk for healthcare staff have been published [11]. The high risk groups for bloodborne infections include staff of diagnostic laboratories, nurses, and surgical staff [12]. The aim of this study was to estimate the incidence and circumstances of needlestick injuries in a selected population of nurses from the city of Poznań and the Wielkopolskie province.

MATERIALS AND METHODS

A questionnaire was filled in by 232 active nurses with secondary education, studying externally at the Medical University in Poznań. The sample was representative of nursing specialisations and workplaces of nurses in Poznań and the Wielkopolskie province. It comprised of nurses aged 22–51 years (mean, 35 years) with work experience of 2–31 years (mean, 13 years). The workplaces of the study group were fairly diverse, but the great majority of nurses were employed in inpatient care (Table 1) working in shifts (166 people).

The questionnaire sought information concerning the occurrence of a needlestick injury among respondents experienced at his or her workplace in the last two years (2003–2004), the circumstances of the incident, who was responsible for its occurrence, and injury notification in hospital documentation (sample questionnaires are available from the author).

Table 1. Workplaces of the study population of nurses (N = 232)

Workplace	Number of nurses (%)
Non-surgical wards	85 (36.6)
Surgical wards and operationing room	83 (35.8)
GP outpatient clinics	21 (9.2)
Emergency units and emergency service	17 (7.4)
Intensive care units	10 (4.3)
Social nursing	7 (3.1)
Dialysis units	4 (1.3)
Other	5 (2.3)

Table 2. Percent of accidents in different workplaces per year

Workplace	Percent of accidents per year
Non-surgical wards	21.2
Surgical wards and operationing room	31.3
GP outpatients clinics	35.7
Emergency units and emergency service	38.3
Intensive care units	45.0
Social nursing	0.0
Dialysis units	50.0
Other	10.0

RESULTS

Incidence

In the study population of 232 nurses, there were 130 cases of needlestick injuries at work in the years 2003–2004. This means that the probability of such an accident per year equals 28.0%. Accidents of this kind were most common among nurses working in surgical wards, operating rooms, emergency medical care, GP surgeries and dialysis units (Table 2). There were significant differences in the incidence of needlestick injuries ($p = 0.05$, Fisher test), between GP surgeries (statistically more common) on the one hand, and surgical wards, non-surgical wards and operating rooms on the other. Moreover, accidents in operating rooms and surgical wards were significantly more common compared to non-surgical wards.

Instruments

Instruments contaminated with infectious material were responsible for 73.8% of injuries in the study group of nurses. They were usually injection needles. Injuries from sterile needles, clean scalpels and contaminated scalpels were much less common (Fig. 1).

Circumstances

In the vast majority of cases, injuries were self-inflicted, and much less frequently caused by patients or colleagues (Fig. 2). The circumstances of injuries from contaminated injection needles were very characteristic (Table 3). Most of these accidents happened during an attempt to remove a needle from a syringe; less commonly, while trying to

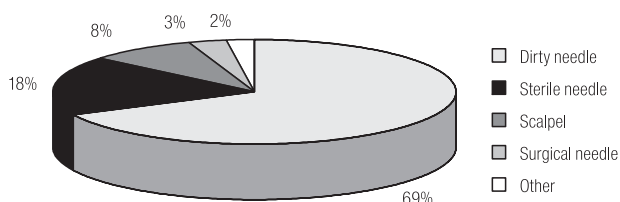


Fig. 1. Instruments causing injuries in the study population of nurses.

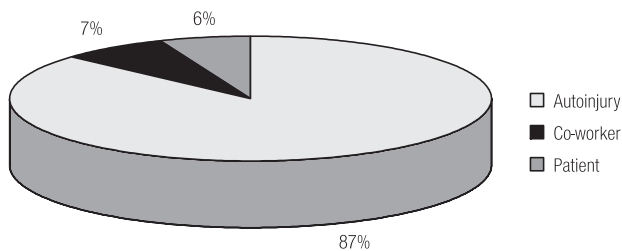


Fig. 2. Perpetrators of accidents.

Table 3. Circumstances of accidents

Circumstances of accident	Number of cases
Putting in container for biological hazards	20
Dismantling of syringe and needle	36
Rearranging of needles to another container	1
Damage of container	2
Putting a needle plug	4
Other	25

place a used needle in a full medical waste container. In almost half of the cases (44.9%), the accidents occurred between the second and the fourth hour of the shift, which was probably due to a typically heavy workload in those hours, particularly on a morning shift. In the great majority of cases (84%), the nurses were wearing protective gloves at the time of accidents.

Injury notification

A vast majority of exposures to contaminated with infectious material were notified in a "book of needlestick injuries" (87.8%), and several accidents in the nurses' reports; 50.0% of all the accidents were orally reported to superiors (a doctor, a ward nurse, an epidemiological nurse).

DISCUSSION

The incidence of needlestick injuries in the study group of nurses is comparable to that observed in other countries.

Most of such cases are stabs from needles contaminated with potentially infectious material. Typically, an injured person is responsible for causing an injury. In this respect, the analysis confirms the results of earlier studies. For example, Ippolito et al. [13] have shown that more than 75% of injuries occur while performing everyday activities of patient care and that most of the injuries are self-inflicted (84%), while only 5% are caused by colleagues and 11%, by patients [14]. In our analysis, the circumstances, which entailed particularly high risk of injury were: improper handling of used needles, removing needles from syringes, and attempts at "saving" room in containers for infectious medical waste. These circumstances typically lead to frequent needlestick injuries. It is alarming that needlestick injuries are often caused by hollow-bore needles, associated with statistically higher risk of infection than that induced by solid tools [15]. Unfortunately, fairly typical circumstances of needlestick injuries reveal insufficient knowledge among nurses in this regard. It should be pointed out that American studies, for instance, show that educational programs and modern equipment can significantly reduce the incidence of needlestick injuries [16–21]. The results of this analysis prove that such programs and innovations are necessary in Polish conditions.

CONCLUSIONS

- 1) The probability of a needlestick injury in the study group per year was 28.0%. Accidents of this kind were most common in nurses working in dialysis units, emergency medical care, GP surgeries, surgical wards, and operating rooms.
- 2) Occupational sharps injuries were most often caused by a contaminated injection needle.
- 3) The injuries were self-inflicted in the vast majority of cases.
- 4) The most common cause of injuries from needles was an improper handling of syringes and needles after injections (removing a needle from a syringe or placing the needle in a full container for medical waste).

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