



An Evaluation of Percutaneous Injuries of Healthcare Personnel: An Eighth-Year Data Analysis

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Abstract

Objective: The sharp object injuries constitute an important problem for the healthcare staff. The aim of this study is to retrospectively evaluate percutaneous injuries in İnönü University, Faculty of Medicine in the last eight years.

Materials and Methods: Percutaneous injuries that occurred in our hospital between 2006 and 2013 were evaluated respectively..

Results: 144 percutaneous injuries recorded during the last eight years were included in the study. The rates of exposure were found to be 44% (63) for cleaning personnel, 17% (25) for nurses, 12% (17) for medical students, 12% (17) ancillary staff and caregivers, 6% (9) for apprentice nurses, 5% (7) for technicians, and 4% (6) for doctors. The number of percutaneous injuries were found to be 126 (87%) for needle stick injuries, 11 (8%) for lancet injuries and 7 (5%) for mucosal (eye) contacts. We have observed a significant decrease in the total injuries and injured cleaning personnel, ancillary staff, and nurses ($p<0.001$).

Conclusions: Throughout 8 years, percutaneous injuries were significantly reduced among healthcare staff. We plan to provide continuous education for healthcare personnel and follow up feedback in our hospital.

Keywords: Sharp Injurious; Health Worker; Needle Stick Injurious.

Perkütan Temas Yaşayan Sağlık Personelinin Değerlendirilmesi; Sekiz Yıllık Veri Analizi

Özet

Amaç: Kesici delici

alet yaralanmaları sağlık çalışanları için önemli bir problemdir. Bu çalışmada hastanemizde sekiz yıl içinde oluşan perkütan yaralanmaların retrospektif yıllara göre dağılımının irdelenmesi amaçlanmıştır.

Gereç ve Yöntemler: Hastanemizde 2006-2013 yılları arasında oluşan perkütan yaralanma olayları retrospektif incelenmiştir.

Bulgular: Sekiz yıllık dönemde 144 personelde perkütanöz yaralanma kaydedilmiştir. Bunların %44'ü (63 kişi) temizlik çalışanı, %17'si (25) hemşire, %12'si (17) tıp öğrencisi, %12'si (17) hasta bakıcı, %6'sı (9) öğrenci hemşire, %5'i (7) teknisyen ve %4'ü (6) doktordur. Perkütan yaralanmaların 126'sı (%87) iğne batması, 11'i (%8) bistürü kesisi, 7'si (%5) mukozal temas (göze sıçrama) şeklinde gerçekleşmiştir. Yıllar içerisinde toplam yaralanma olaylarında ve temizlik çalışanı, hasta bakıcı ve hemşire yaralanmalarında anlamlı düşüş olduğu görülmüştür ($p<0.001$).

Sonuç: Sekiz yıl içerisinde sağlık çalışanlarında perkütan yaralanma olaylarının anlamlı olarak azaldığı saptanmıştır. Hastanemizde Sağlık çalışanlarına eğitimlerin düzenli verilmesi ve geri bildirimlerin takip edilmesi planlanmıştır.

Anahtar Kelimeler: Kesici Delici Alet Yaralanması; Sağlık Çalışanı; İğne Batması.

INTRODUCTION

Healthcare professionals are often exposed to accidental sharp object injuries or splatter of body fluids or blood during medical procedures. Centers for Disease Control (CDC) has reported that healthcare professionals are exposed to about 385,000 sharp object injuries due to sharp objects, which creates an increased risk for infective viruses spreading from blood. It has also been reported that injuries caused by sharp objects come with high costs to healthcare professionals and health services (1). Today, percutaneous injuries can considerably be reduced by using safe medical equipment, taking blood with vacuum tubes, not putting injection needles back into sheaths after use, placing

sharp objects to infectious waste bins after use, and using protective equipments (2). In this study, we aim to retrospectively evaluate the case of healthcare staff who are exposed to blood and body fluids.

MATERIALS and METHODS

Our hospital has a total bed capacity of 1120 along with 250 intensive care beds and 26 operating theatres. We have retrospectively examined the percutaneous injuries that have been reported in stab injuries forms to the Infection Control Committee (ICC) of our Hospital between 2006 and 2013. The statistical analysis was carried out with SPSS 16.0 software. The statistical evaluation of changes in the number of cases in years was made by linear regression analysis.

RESULTS

To this end, we have statistically evaluated 144 stab injury forms that have been reported to the ICC between 2006 and 2013 with SPSS. 66% (n=95) of the staff experiencing percutaneous contacts were males and 34% (n=49) were females. The forms were filled in by several staff: 44% (n=63) were cleaning personnel, 17% (n=25) were nurses, 12% (n=17) were medical students, 12% (n=17) were caregivers, 6% (n=9) were apprentice nurses, 5% (n=7) were technicians, 3% (n=5) were physician assistants, and 1% (n=1) was a faculty member (Table 1). 87% (n=126) of these reports were due to pinprick, 8% (n=11) were due to scalpel incision, and 5% (n=7) were mucosal contact (splashing into the eyes) (Figure 1). Studying the distribution of these incidents in years, a statistically significant decrease

through 2006 to 2013 was observed ($p < 0.001$). Our survey has shown that most significant decrease was observed in cleaning staff, nurses, and caregivers (Table 1). Correspondingly, needle-stick injuries have experienced a statistically significant fall throughout the years (Table 2). We have found out that cleaning personnel, who are exposed to injuries the most, have experienced the majority of these injuries while collecting wastes. Injections and taking blood constitute an important part of percutaneous injuries; our research has shown that 24 nurses, 17 medical students, and 9 apprentice nurses were injured while making injection during the course of seven years (Table 3). In 56% of these injuries, the source was unknown while 44% of the incidents were results of known sources. However, it has been discovered that in the cases of 62 out of 63 (98%) cleaning staff the source of injury was unknown (Table 4).

Table 1. The distribution of percutaneous injuries and job titles in years.

Year	Nurse	Cleaning Personnel	Reserach Assistant	Medical Student	Apprentice Nurse	Faculty Member	Caregiver	Technician	Total
2006	4	5	2	1	1	0	2	0	24
2007	1	6	0	3	0	0	4	1	15
2008	5	8	0	4	3	0	4	1	25
2009	7	9	0	2	0	0	2	2	22
2010	2	8	1	2	1	0	1	0	15
2011	3	8	1	2	2	1	3	1	21
2012	1	4	0	0	2	0	0	1	8
2013	2	6	1	3	0	0	1	1	14
Total	25	63	5	17	9	1	17	7	144

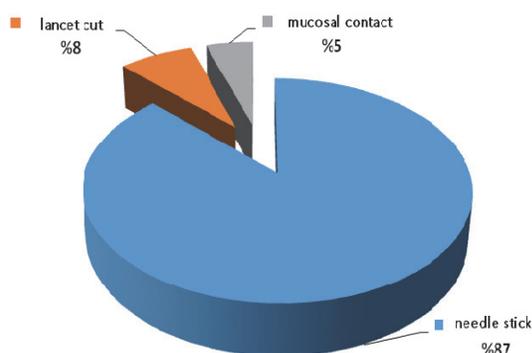


Figure 1. The distribution of percutaneous contacts according to injury type.

Table 2. The distribution of percutaneous injuries and injury types in years.

Year	Needle stick	Liquid/Blood spatter	Lancet cut	Total
2006	18	2	4	24
2007	14	0	1	15
2008	22	0	3	25
2009	19	2	1	22
2010	13	0	2	15
2011	19	2	0	21
2012	8	0	0	8
2013	13	1	0	14
Total	126	7	11	144

Table 3. The description of jobs at hand at the time of injury.

	Nurse	Cleaning Personnel	Reserach Assistant	Medical Student	Apprentice Nurse	Faculty Member	Caregiver	Technician	Total
Collecting wastes	0	63	0	0	0	0	4	0	67
Taking blood sample	4	0	1	16	1	0	0	0	22
Injection	19	0	0	0	8	0	0	1	28
Bodily fluid Contact (eye/mucosa)	1	0	3	0	0	1	1	0	6
Blood related procedures	1	0	0	1	0	0	0	6	8
Cleaning equipments	0	0	0	0	0	0	12	0	12
Medical dressing	0	0	1	0	0	0	0	0	1
Total	25	63	5	17	9	1	17	7	144

Table 4. The source of reported injury.

	Known source	Unknown source	Total
Nurse	25	0	25
Cleaning Personnel	1	62	63
Reserach Assistant	5	0	5
Medical Student	16	1	17
Apprentice Nurse	9	0	9
Faculty Member	1	0	1
Caregiver	1	16	17
Technician	6	1	7
Total	64	80	144

DISCUSSIONS

Stab wounded and accidental injured healthcare and cleaning staff constitute major risks for other personnel. Personnel accidentally exposed to blood or body fluids contaminated with viruses, bacteria, parasites or yeast can develop infections. Especially hepatitis B (HBV), hepatitis C (HCV), and human immuno-deficiency (HIV) viruses are more frequently seen in people who experience contaminated blood or body fluids exposure (3). In this study, we have retrospectively evaluated 144 percutaneous injury cases of Turgut Ozal Medical Centre staff that were reported by the Infection Control Committee between 2006 and 2013.

Despite the large number of beds, intensive care units, and healthcare personnel in our hospital, the given number of 144 stab wounds is comparatively few. We believe that this was because the staff exposed to sharp object injuries did not report all injuries and/or they did not at all know that they were supposed to fill in a form about such injuries. Studies have shown that injector needle injuries are generally neglected to be reported and that 26-85% of all injector injuries remain unreported (4). Altrok et al.'s study states that only 98 of 956 injuries included in their study were sharp object injuries. They claim that healthcare staff's lack of knowledge about the necessity to report these events, their worries, their ignorance about the risk of infection, and their lack of knowledge about the procedures were among the reasons for skipping over these reports (5).

Merih et al.'s study evaluating the hospital data covering three years has put forward that cleaning staff, with 71.9% out of 57 cases, were the group that was exposed to such injuries the most. The study has added that these injuries often took place while during waste collection (6). In our study, too, cleaning staff were in the lead and followed by nurses, medical students, and caregivers, respectively. The most important reason for cleaning staff to be exposed to these accidents, most of which occur while collecting wastes, is that sharp objects are often dumped into medical or household waste disposal bins rather than sharp object containers. In addition, reckless moves that do not comply with the

rules are considered to be a factor increasing these injuries during waste collection. Our study has also shown that in 56% of the cases the injuries resulted from unknown sources; this rate was 98% for the cleaning staff. Lakbala et al.'s study on the injector needle injuries of cleaning personnel puts forward that the most common reasons of these injuries were improper use of injectors, excessive filling of the sharp object containers, and disposing injector needles into waste bags other than njection needles containers (7). Shiao et al.'s study on sharp object injuries conducted in Taiwan involving support unit workers such as laundry workers, cleaning staff, porters, and technicians in 16 hospitals claims that the majority of injuries (65.7%) involved cleaning staff while 54.7% of these accidents resulted from inappropriate disposal of sharp objects (8).

Sharp object injuries are a major problem in the healthcare personnel though the risks are preventable. It has been discussed that nurses (91%) are exposed to such injuries more than physicians are (6%) since they use sharp object and injectors more frequently in clinics (4). In a 820-bed training hospital in Ireland, 140 of 286 sharp object injuries over a period of three years involved nurses, making them the most injured group. It has been emphasised that the injuries often occurred during the implementation of medical processes and improper disposal of sharp objects including injectors (2). In our study, the second most affected group was nurses, who were mostly injured during performing injections. In a study conducted in Diyarbakir Training and Research Hospital by Kaya et al., nurses were the most affected victims of sharp object injuries among healthcare staff and 50.6% of these injuries took place while placing the cap back on the injector (9). Healthcare Infection Control Practices Advisory Committee (HICPAC) and CDC have published some precautionary measures against sharp object injuries to protect healthcare personnel. The measures suggest that healthcare staff should follow universally standard precautions, avoid placing injector caps back on after use, and, in order to prevent mucosa-related contamination, use protective equipment such as gloves, goggles, mask, and face shields (10-11).

It has been put forward that sharp object injuries often result from frequent injection applications, unnecessary use of sharp objects, using unsafe injectors, ignoring the disposal of sharp objects, and trying to place the caps back on the injectors after use. Further, it has been proposed that such injuries should be regularly recorded and analysed while professionals should organise focused training programmes to train employees and prevent injuries (12). Studying the distribution of injuries in years, it is observed that there is a decrease in the second four-year period (2010-2013) in contrast with the first (2006-2009), especially in terms of the number of injured nurses and caregivers. In addition, we have also found out that the number of reported injuries from the faculty members and assistant doctors was considerably fewer. Examining the distribution of injuries among the occupational groups, we have noticed that nurses, cleaning personnel, and caregivers, who took part in

training to prevent sharp object injuries, provided regular feedback about their injuries after the programme. To prevent injuries, new feedback forms were produced and warning signs were put in places with improper wastes. It is important to note that in 2012, when precautionary warnings were regularly made, there was a significant drop in the frequency of these injuries. However, it should be kept in mind that trainings will be insufficient without feedbacks.

An effective waste management that can provide proper disposal of injectors is critical to the prevention of needlestick injuries. The use of puncture-resistant waste boxes that would allow the disposal of injector needles to be dumped without the need of cap placement and placing these boxes to easily accessible places are both necessary to prevent these injuries. For this purpose, in collaboration with ICC and hospital administration, waste bins were placed in easily accessible places in our hospital. Moreover, we have also designed training programs to raise awareness with emphasis on what to do in case of percutaneous and mucosal injuries. In these trainings, we have underlined the effective use of eye shower area in blood and body fluid splatter accidents.

As a result, we have seen that once injectors are properly collected and the staff is trained, the incidence rate of sharp object injuries have gone down to a great extent especially among cleaning personnel, nurses, and caregivers, the three most frequently trained groups. However, since the feedback rates among other groups, especially physicians, was low, we have failed to evaluate these healthcare professionals. Injuries due to sharp objects is an important risk factor for healthcare staff and, avoidable as they are, they should be taken into consideration. Therefore, to prevent sharp object injuries, training programmes that would include all groups of healthcare personnel should be conducted regularly.

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