



Occupational Blood Exposure among Health Care Personnel and Hospital Trainees

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Abstract

Blood and body fluid Exposure is a major occupational safety problems for health care workers. Therefore, we conducted a descriptive and retrospective study to identify the characteristics of blood exposure accidents in health care settings which lasted five years (2005-2009) at the two university hospitals of Sfax. We have 593 blood exposure accidents in health care settings 152 (25.6%) health personnel and 441 (74.4%) trainees' doctors, nurses and health technicians. The mechanism of blood and body fluid exposure was accidental needle-stick injury in 78.9% of health staff, and 81% of trainees, accidental cut in 14.7% of health workers and 10.2% of trainees. The increasing severity of blood exposure accidents is linked to the lack of safe behavior against this risk.

Keywords: Body fluids; Occupational exposure; Accident prevention; Accidents, occupational; Health personnel; Hospital medicine

Introduction

Exposure to blood and infectious body fluid (BBF) remains a major occupational safety problems for health care workers (HCWs).¹ The occurrence of BBF exposures represents a major permanent risk of occupational infections, especially in countries where it is insufficiently evaluated and even more poorly taken care. Despite the recommendations and the efforts of training and information, these accidents take a very important place among all accidents recorded in health care setting, and are most worrying when they concern the categories of hospital trainees.^{2,3} We conducted this study

to identify the characteristics of BBF exposures in both hospital staff and students.

Materials and Methods

In a cross-sectional study conducted from January 1, 2005 to December 31, 2009, BBF exposures were studied among HCWs working in two university hospitals of Sfax, Tunisia. HCWs included staff workers and health care trainees. The data were collected through self-report data sheet and by referring to the HCWs' medical files retained in the service of occupational medicine and the registry of the microbiology laboratory of the university hospital of Sfax. The data collection sheet contains

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information related to demographics, injury, attitude of the HCWs after exposure, status of serology, and history of vaccination against HBV. The collected data were analyzed by SPSS® for Windows® ver 11.

Results

We studied 507 HCWs—43 (8.5%) medical students, 207 (40.8%) medical interns, 50 (9.9%) medical residents, 88 (17.4%) nursing students, 84 (16.6%) nurses, and 35 (6.9%) high technicians.

During the study period, 593 BBF exposures were reported by HCWs—152 (25.6%) health personnel, and 441 (74.4%) doctors, nurses and laboratory technicians trainees.

Considering that the cumulated hospital staff during the study period was 13 283 workers, the mean incidence rate of the exposure was estimated at 11.4 per 1000 employees per year. The mean age of those with the exposure was 28 (range: 18–58) years; two-thirds of exposed HCWs were female.

The mechanism of BBF exposure was accidental needle-stick injury in 78.9% of health staff, and 81% of trainees, accidental cut in 14.7% of health workers and 10.2% of trainees, while the projection of blood on damaged skin and/or mucous mem-

branes was reported by 6.4% of the health care staff and 8.8% of hospital trainees.

BBF exposure occurred in health staff in decreasing order during drug injection (17.1%), blood sampling (13.6%), garbage collection (10.6%), and check of blood glucose by a lancet (5.3%). On the other hand, BBF exposure occurred in hospital trainees mostly during check of blood glucose by a lancet (35.4%), drug injection (12.3%), and blood sampling (6.8%).

The main actions taken place during the incidents in health staff were inattentive handling of sharps in 13.3% of cases, and recapping needles in 11.8% of cases; 10.5% of cases were injured with the needles came out of overflowed containers. The main actions in hospital trainees, were recapping needles (21.1%), followed by inattentive handling of sharps (11.2%); 7.5% were injured with needles came out of overflowed container. The empty needle was the main cause of BBF exposure in both health staff (50%) and hospital trainees (64.3%).

For both the hospital staff and trainees, the BBF exposure mainly affected the hand (86.8%), followed by face (4.3%) and feet (1.4%). BBF exposure in hospital staff and hospital trainees occurred respectively, in medical services (37.5% and 50.8%), surgical services (34.8% and 33.3%), intensive care units and urgency (17.7% and 16.5%), and medical laboratories in the remaining cases.

Most of the exposed HCWs consulted an occupational physician within the first 24 hours of incident. The period before consultation was <4 hrs in 41.4% of hospital personnel and 42.2% of trainees, and 4–24 hrs in 30.9% of staff and 33.3% of trainees. Several consultations were recorded after the acceptable period of consultation (48 hrs).

Only 5.3% of hospital personnel and 10.5% of hospital trainees were wearing gloves. The use of masks was reported by 1.4% of hospital personnel and 2.8% of

TAKE-HOME MESSAGE

- Exposure to blood and infectious body fluid (BBF) remains a major occupational safety problems for health care workers (HCWs).
- Nurses were the category of hospital staff that declares most often their BBF exposure to the health service work. They are considered the group mostly at risk of BBF exposure for their workload.
- The risk of BBF exposure is strongly related to the type of action taken.

trainees. Merely, 2.1% of hospital personnel and 2.8% of trainees had at their disposal accessible and secure containers.

Regarding immediate care after BBF exposure, washing hands with water was a habit followed by the majority of hospital staff (92.8%) and trainees (96.2%). However, 69.1% of hospital staff and 61.9% of trainees used water and soap for washing their hands. Only 45.4% of hospital staff and 39% of trainees used antiseptics. Some hospital staff (7.7%) and a few trainees (1.4%) wrongly bled their wounds.

After an accident, HIV, HBV and HCV tests were performed for the source patient if he was available. HBV, HCV and HIV were positive in 32 cases, 15 cases, and 7 cases, respectively (Table 1).

Discussion

To assess this risk of BBF exposure, we surveyed all cases of BBF exposures recorded for a period of five years. Although we identified 593 cases, this figure does not reflect the real risk since many HCWs might ignore the significance of reporting of the exposure. In particular, doctors were less likely to report their exposures.⁴

We conducted a separate analysis of the characteristics of BBF exposure among health care staff and health care trainees in order to streamline a preventive action specific for each category. It seems that an appropriate action to be taken for the prevention of exposures would be ongoing education and training particularly when they are provided during the learning phase, which allow trainees to efficiently adhere to the rules of good practice that may contribute to decline the incidence of BBF exposure among hospital trainees.

Several studies have shown that the most affected HCWs by the BBF exposure were paramedical staff with varying frequencies ranging from 55% to 70%; this frequency was less important for hospital

Table 1: The frequency of positive serology results of the source patient stratified by the study groups.

	Trainees, n (%)	Hospital staff, n (%)
HBV serology		
Positive	23 (5.2)	9 (5.9)
Negative	289 (65.5)	77 (50.7)
Unknown	68 (15.4)	54 (35.5)
Not mentioned	61 (13.8)	12 (7.9)
HCV serology		
Positive	7 (1.6)	8 (5.3)
Negative	281 (63.7)	74 (48.7)
Unknown	68 (15.4)	54 (35.5)
Not mentioned	85 (19.2)	16 (10.5)
HIV status		
Positive	5 (1.1)	2 (1.4)
Negative	287 (65.1)	76 (50)
Unknown	68 (15.4)	54 (35.5)
Not mentioned	81 (18.4)	20 (13.1)

trainees.⁴⁻⁸ Our results for the frequency of BBF exposure in these occupational categories differed from those in the literature since three quarters of our population were represented by the trainees. Indeed, trainees are a high-risk population since they are most concerned with the activities of care and the main circumstances of the occurrence of BBF exposure. May be stress, precipitation, easy access to the execution of care procedures during training, and the lack of experience and proper training in standard precautions and safety rules are also main contributing factors favoring the occurrence of BBF exposure among this group in the learning phase. It was difficult to give a precise incidence of BBF exposure in medical students for the lack of accurate data on their numbers and their fast mobility inside hospitals.

Nurses were the category of hospital staff that declares most often their BBF exposure to the health service work. They are considered the group mostly at risk of BBF exposure for their workload.^{5,6,9}

In addition, a low rate of reporting of BBF exposure by doctors was noted. This under-reporting of BBF exposure by concerned doctors underlined the underestimation of the risk in a professional group presumed more aware of its seriousness.^{10,11}

As in all studies, the risk of BBF exposure is strongly related to the type of action taken. Some gestures and situations at high risk were still widely described as frequent recapping needles and the delayed disposal of contending contaminated objects by lack of proximity to the container. In fact, it is awful that recapping of needles was always practiced with a significantly high frequency, in particular for trainees. Add to that, the intentional bite when handling sharp objects or by needle overflowing unsuitable or full container. Indeed, a significant proportion of these BBF exposures were avoidable by simple observance and enforcement of standard precautions and good practice such as the routine use of gloves when performing gestures at risk. Outside the operative procedures, wearing gloves was still insufficient in our institutions, where the responsible person must bear in mind the notion that the presence of suitable available containers in sufficient numbers has a great benefit for reducing the occurrence of BBF exposures.¹²⁻¹⁶ To strengthen this concept, it is sufficient just to remember the results of the multicenter survey conducted by Abiteboul among nurses in France, where the proportion of avoidable bites by standard precautions increased from 53% in 1990 to 39% in 2000.¹⁴

Observance of standard precautions, wearing gloves and masks were insufficiently respected by both categories, thus

justify the reinforcement of actions to improve hygiene and safety for as well as health staff, trainees and their supervisors.²

Conflicts of Interest: None declared.

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