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Research paper

Accidental exposure to blood (AEB), a real public health problem for medical and paramedical staff at the university hospital of mostaganem

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Abstract

Accidents involving exposure to free and bodily fluids are a real problem for health professionals, especially paramedics. Several factors aggravate this situation, including the lack of protective vaccination, neglect of protective measures, overwork, e.g. The aim of our study was to identify the number of cases of AEB in the working population, as well as the main causes leading to this.
This is a retrospective study on the records of patients declared victims of AEB in the infectious diseases department of the Mostaganem University Hospital from January 2022 to December 2023. Inclusion criteria: HIV-negative patients. Have a viral load in the first month for HIV. Known vaccination status for HBS.
Forty-four patients were identified, with a predominance of more than 68% among nurses, The hollow needle was the most frequent source of contamination in 50% of cases, and the department most at risk of these accidents was medical-surgical emergencies, Overexertion was found in 48%, as well as the absence of hepatitis B vaccination, the virological status of the source was unknown in 46% of cases, ARVs were adhered to for 28 days in 85% of cases.
Exposure to blood has become one of the major problems in healthcare settings for paramedics especially, with hollow needle sticks remaining the leading cause as well as blood splashes. Even if the causes are well known and the conduct to be followed is well codified, these accidents are most often neglected and largely underreported. As a result, management is delayed and may expose patients to the risk of seroconversion for HIV, HCV, HBS.

Keywords: *Blood Exposure Accidents; HIV; HCV; HBS; Victim Statement; Prophylaxis.*

1. Introduction

Accidental exposure to blood (AEB) and body fluids is defined as accidental and involuntary exposure to blood and/or body fluids such as plasma, urine, tears, cerebrospinal fluid, etc. whether or not mixed with blood, during a medical or medical-surgical procedure. This is a real public health problem, especially among hospital staff, and exposes them to the risk of transmission of blood viruses such as HIV, hepatitis B virus and hepatitis C virus [1]. Although several infectious agents can be involved in this process, hepatitis B virus (HBV) and hepatitis C virus (HCV), as well as human immunodeficiency virus (HIV) remain the most dangerous and often incurable pathogens for health care workers. The estimated risk of HIV transmission after a hollow needle stick is about 0.3%, this risk is multiplied by a hundred in hepatitis B (30%) and by ten in hepatitis C (3%). Needlestick accidents are on the rise, becoming very worrying, as well as the prevalence of these blood-borne illnesses in the healthcare community and even in the general population is taking significant levels [2].
The health safety of healthcare workers is seriously threatened by the risk of exposure to blood and/or body fluids, and this cause-and-effect relationship is frequent but not mandatory in all cases. The occurrence of these serious infections depends on the prevalence of these infections in the population concerned, the frequency of exposure accidents, the specific type of exposure, and the effectiveness and timeliness of both post-exposure and pre-exposure procedures [2].
Preserving health safety of the medical and paramedical staff remains a major concern, the necessary measures must be taken and applied to avoid these accidents as much as possible. We need to ensure the prevention of harm to patients and workers, with a focus on the most effective system of care to prevent errors, which occur in the course of the practitioner's daily activity, and is based on a reorganization of this entire system involving health professionals, organizations and patients [3].
The estimation of this insecurity of healthcare professionals due to an often faulty system remains very underestimated, especially in underdeveloped countries, in sectors where the workload remains very high, where the patient's circuit remains anarchic and where respect for working conditions and sorting of waste is neglected by workers and not sanctioned by states [3]. Emphasis must be placed on addressing failures in the quality of care, as the risk of these accidents increases if safety of care is not ensured. Improving the quality of care and providing optimal conditions for staff in the practice of their medical and paramedical activities remain the key issues to counter this risk [4].
In developing countries, the uncontrolled nature of care is even more prevalent with the occurrence of healthcare-associated infections 20 times more frequent than in developed countries [5]. It increases with the risk of bruissure, aggression and bleeding in these same areas

[4]. Indeed, Of the 15,548 cases examined in eight underdeveloped countries, 8.2 per centhad at least one adverse event, with a range of 2.5% to 18.4% per country. Eighty-three percent of these adverse events could have been avoided and 30% led to the patient's death [6]. According to a study carried out in Cairo, A significant number of participants reported the occurrence of secondary care accidents to their own negligence (79.3%), and that the errors were blamed on them and that they were mainly due to not wearing gloves, neglecting traumatic wounds, wanting to liquidate as many patients as possible in a short time, but also neglect in late hours of the night shift [7]. However, these accidents are currently being taught to health care workers, as only 26.13% of the nurses surveyed recorded high risks and fears of these accidents. Two-thirds (77.90%) of respondents reported no adverse events in the past 6 months [7]. Evidence has been gathered that all the mistakes made in the treatment of patients were mainly due to pressure and workload, with staff taking their share of responsibility through negligence. Cleaning agents are not spared from this risk, the incidence of accidents remains less important than for nursing staff, their accidents are due to negligence and lack of knowledge of the methods of transmission [8].
These are preventable infections, thanks to infection control and surveillance measures that significantly decrease the risk of HIV and hepatitis transmission. However, the majority of studies carried out with the aim of assessing compliance with the reporting of blood exposure accidents have shown a major defect in the compliance with standard precautions by the health professional and that the proportion of prompt medical assistance after exposure remains low [2].
Algeria attaches paramount importance to the sorting and transport of hospital waste to respect working conditions, and covers large awareness-raising campaigns dedicated to paramedical and medical staff in order to avoid future accidents. The rapid management of these accidents is well codified and is regularly updated, in order to protect the nursing staff as much as possible [1, 8]
Individuals currently report a possible contagious sexual intercourse in time, and their management must be done immediately [9]. PrEP is the use of antiretroviral therapy to prevent HIV infection in HIV-negative people who are at higher risk of contracting HIV. These include serodiscordant couples and key populations. Pre-exposure prophylaxis should be provided to people with a high potential to contract HIV [10]
The objective of this study: Describe the circumstances under which AES occurs. Estimating the incidence by occupation

2. Methods

2.1. Study design

This is a retrospective study on the records of AEB patients reported to the infectious diseases department of the Mostaganem University Hospital from January 2022 to December 2023. It was an exhaustive sample of anyone exposed to this risk, even in non-hospital settings, who presented themselves to our level.

2.2. Population study

The choice of the population studied was made up of health care workers who were in continuous contact with patients or who posed an obvious problem of exposure to patients' body fluids, primarily those requiring heavy management in an occupational setting. These health care workers included physicians (medical specialists, resident general practitioners and interns), nurses, laboratory staff, cleaners. The study also included victims of unprotected sexual exposure, whose partners were suspected of being HIV-positive

2.3. Inclusion criteria

Patients reported to have a negative initial complete serology.
Patients followed with a viral load in the first month for HIV.
Known vaccination status for HBS

2.4. Study setting

The data collection took place on the basis of patient records declared by the infectious Disease Service, located within the University Hospital of Mostaganem, a university hospital, with a load of patients greater than the number of nursing staff, and which suffers from the influx of patients from neighbouring and other wilayas.

2.5. Conduct of the study

A questionnaire with simple questions prepared to meet the objectives of this study. It contained 30 questions, including those relating to epidemiological characteristics (age, sex, occupation, employment, duration of employment), history of a previous AEB, type of accident (liquid, instrument), and the time between AEB and reporting.
The questions were simple, systematically contained in the patients' files, incomplete files were systematically discarded. All occupations were included without discrimination. Accidents reported following contaminating sexual intercourse were slightly modified.

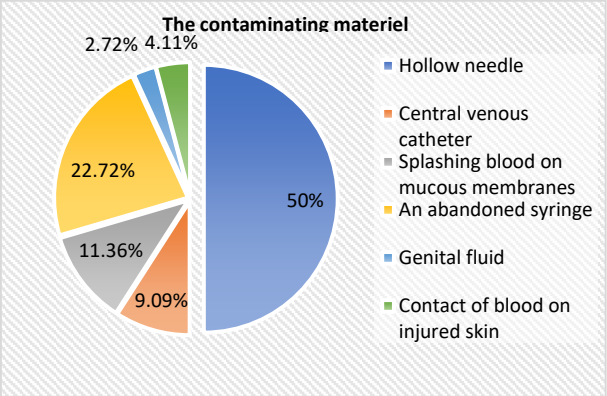
2.6. Data analysis

Data entry done with SPSS version 22 and MS Excel, determine prevalence by gender, different occupational fields, and years of experience. Next, we'll calculate the incidence of AEB. The profiles and distribution of the victims as well as the proportions of the different mechanisms involved (percutaneous lesion or splash) were also figured. In a second step, we assessed the risk of contamination and transmissibility for each type of AEB by determining the proportion of HBV vaccinated or not among the victims, and by calculating the number of workers without protective equipment at the time of the accident.

3. Results

- During this 24-month period, we identified 44 people with AEB and from body fluids,

- The professions concerned were: *Nurses in 30 cases or 68.18%, more than half of whom were women (20 cases). *Four cases were housekeepers, all women. *Security guards: 6 men or 13.63% of cases. *Physicians were affected in 3 cases. *As for contaminating sexual intercourse, it was reported to a person, it was a single homosexual relationship with the notion of the presence of blood.
- The contaminating material was represented in graph N°1:



Graph: N°1.

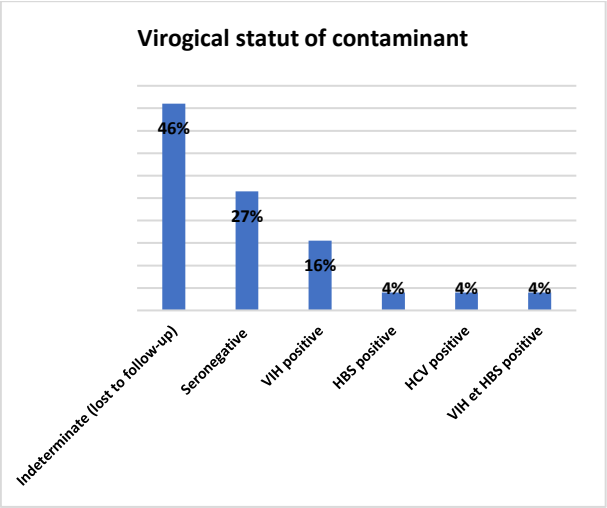
- The services where the health professionals (30 nurses and 3 doctors) worked was as follows

Services	Number
Emergency	11 cases
Intensive care units	6 cases
Surgery	5 cases
Gynecology	6 cases
Infectious desease	2 cases
Pediatry	3 cases

- Caregivers who were victims of AEB were young with little experience, their average age was 25 years with an average of less than 5 years of practice.
- The course of action to be taken in the aftermath of these accidents was:

1) Proper management with washing and disinfection of the entrance door, not sucking or bleeding the wound, declaration, found the immunovirological status of the source patient and prophylactic treatment in 69% of cases.
2) Correct initial care but victim lost to follow-up in 24% of cases.
3) Neglected wound and indeterminate management in 7% of cases.

- Declaration to medical work in 88% of cases
- Virological status of the contaminant: graph N°2



Graph: N°2.

- Taking antiretrovirals therapy in 66% of cases, broken down as follows:

Antiretroviral therapy	number
Truvada + Raltegravir	15 cases
Truvada + Efavir	5 cases
Truvada + Kaletra	5 cases
Atripla	4 cases

- The deadline for reporting the accident and taking ARVs was not always respected, exceeding 48-72 hours in more than half of the cases

- ARVs were adhered to for 28 days in 85% of cases, but the others had to stop because of side effects (Digestive disorders such as nausea, vomiting, dizziness and sleep disturbances, especially with efavir and atripla, paresthesia..)
- Hepatitis B vaccination status of the victim: Of the nurses who were victims of AEB, only 7 cases were vaccinated against hepatitis B, this is another problem that extends to the care environment. Only one nurse received specific HBV immunoglobulin on time.
- Seroconversion: Only one 26-year-old nurse was reported to be HIV-positive and who was infected by a hollow needle in the emergency department and whose prophylactic management was delayed (more than 72 hours).

4. Discussion

Just under half (36.7%) of health professionals, primarily nurses, reported the state of exposing to blood and body fluids at least once in their practice, they said this exposure occurred at the beginning of their career, or their experience in dealing with emergencies and difficult situations was still incomplete. The World Health Organization issued an estimate in 2022 regarding occupational exposure to blood, that is responsible for 40% of HBV and HCV infections and 2.5% of HIV cases [12].

Our study is closely linked to the data in the literature, since in the latterSplash was the most reported gateway (60.3% of cases), followed by needlestick injuries (28.7%) and cuts (10.9%). was the most reported gateway (60.3% of cases), followed by needlestick injuries (28.7%) and cuts (10.9%). Estimates show that the majority of victims (20%) have been hospitalized in the surgical and the same uses to the lack of vaccination against hepatitis B in this exposed population, which remains so low since only 36.6 % of respondents were vaccinated against hepatitis B [1].

The prevalence of AEB victims identified in our study is considerably lower than that of a study published in 2010 and conducted in Cameroon (60.7%) in a hospital with a similar technical department [11]. However, a probable explanation can be submitted, it is the passive recruitment on file already present, Compared to the 2013 Kenya study, this proportion remains high at around 25%. [13]. While, compared to the UK, where the frequency of needlestick injuries is around 100,000 per year, our numbers are still significantly lower. The Canadian Centre for Occupational Health reports that the highest number of bite incidents arise among nurses (70%), and the most frequent is the needle-stick injury (75%) [15]. In the countries of Western and Central Europe, including Croatia, the annual common occurrence of blood-transmitted viral infections during the exposure incidents in HCWs is 1/100 (1%) (HCV 0.3%, HBV 0.7% and HIV 0.2%)[16]. Surveys of medical and paramedical staff working in primary care settings have shown that the most common causes of stinging incidents and accidents are rush to work, unpredictable patient reaction and decreased concentration associated with negligence on the part of health care workers [17].

Healthcare workers in our establishment are not up to date on their virological status and in most cases have never been tested before for HIV, HBS, HCV. Consequently, the observed prevalence is significantly lower than that expected in practice, so more than 80%. Which is consistent with the Vojvodina study above, we see a similar frequency of healthcare workers who have never been tested for HBV markers, so 72%. In 2012, many similar studies and research stated that 92% of health care workers had never been tested for HIV, 91% for HBV and 91% for HCV [18].

5. Conclusion

Blood exposure is a common accident in the healthcare setting, with hollow needle sticks remaining the number one cause as well as blood splattering. There is little adherence to post-exposure management, especially in terms of time, and exposures are largely underreported, mainly due to a lack of knowledge about what to do.

Effective strategies to avoid such accidents are identified and codified by national consensus. A health monitoring system (registers) for the reporting and handling occupational accidents and exposures, their management must be based in each public health care establishment. Raising awareness and providing information to health professionals, mainly nurses, will help to avoid accidents caused by negligence and inadvertence. The vaccination of this population of caregivers must be systematic and must be an integral part of the conditions of use (Hapatite B, tetanus, diphtheria, influenza, etc.), it will avoid panic during exposure accidents.

The management of the viral load of HIV patients will considerably reduce the risk of contamination by the virus as well as the culture of PrEP which becomes a social obligation given the increased frequency of serodivergent couples.

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