

Profile of accidents with sharps among health professionals from a hospital of the public network at São Luís city¹

Perfil dos acidentes com material perfurocortante entre profissionais de saúde de um hospital da rede pública da cidade de São Luís

Perfil de accidentes con profesionales de salud entre objetos punzantes de un hospital publico de la red, ciudad de San Luís

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ABSTRACT

Objective: The study' goal has been to perform a survey of the accidents with sharps. **Methods:** It is an exploratory and documental study with a quantitative approach that was carried out by the collection of hospital notification sheets over the period from 2009 to 2015, in a Public Hospital at São Luís city, Maranhão State. **Results:** It has been found the predominance of the female gender, with an average age of 28 years old, complete secondary education; the most affected were nursing technicians and cleaners staff. Blood is the most common organic material; inappropriate disposal of venipuncture material and punctures, such as circumstances; needles and scalpel blades, the most involved; percutaneous exposure with high incidence; Personal Protective Equipment (PPE) are heavily used; in most cases there was no need for chemoprophylaxis; the Work Accident Communication was issued in most cases. **Conclusion:** The data allowed identifying a group of more vulnerable professionals, where is necessary more attention regarding the prevention strategies towards the accidents with this kind of material.

Descriptors: Occupational hazards, sharps, biological agents exposure, occupational health.

RESUMO

Objetivo: Realizar levantamento de acidentes com material perfurocortantes. **Método:** Exploratório e documental com abordagem quantitativa com levantamento de fichas de notificação entre 2009 e 2015, em um hospital público em São Luís do Maranhão. **Resultados:** Predominou o sexo feminino, média de idade de 28 anos, ensino médio completo; os mais acometidos, técnicos de Enfermagem e serventes de limpeza. Sangue é o material mais comum; descarte inadequado de material e punções venosas, como circunstâncias; agulhas e lâminas de bisturi, os mais envolvidos; exposição percutânea com grande incidência; EPIs são muito usados; na maioria, não houve necessidade

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de quimioprofilaxia; a Comunicação de Acidente de Trabalho foi emitida na maioria dos casos. **Conclusão:** Os dados permitiram identificar grupo de profissionais mais vulneráveis, exigindo maior atenção nas estratégias de prevenção de acidentes.

Descritores: Riscos ocupacionais, Perfurocortante, Exposição a agentes biológicos, Saúde do trabalhador.

RESUMEN

Objetivo: Realizar un estudio de material de lesiones cortopunzantes. **Método:** Exploratoria y documental con enfoque cuantitativo con las formas de presentación de informes de la encuesta entre los años 2009 y 2015 en un hospital público de San Luis. **Resultados:** La hembra dominante, con una edad media de 28 años, secundaria completa; los más afectados, técnicos de enfermería y personal de limpieza. La sangre es el material más común; la eliminación inadecuada de los materiales y la punción venosa como las circunstancias; agujas y hojas de bisturí, el más implicado; exposición percutánea con tasas altas; EPP son ampliamente utilizados; en la mayor parte no había ninguna necesidad de quimioprofilaxis; el parte de accidente de trabajo se publicó en la mayoría de los casos. **Conclusión:** Los datos indican grupo de la mayoría de los trabajadores vulnerables, exigiendo una mayor atención en las estrategias de prevención de accidentes. Palabras clave: riesgos ocupacionales, la perforación, la exposición a agentes biológicos de salud ocupacional.

Descritores: Riesgos ocupacionales, La perforación, La exposición a agentes biológicos, Salud ocupacional.

INTRODUCTION

The hospital setting is an environment conducive to the occurrence of accidents with biological hazard, which according to the regulatory standard is the probability of occupational exposure to potentially infectious biological agents,¹ which in turn can cause impacts on physical, social and mental health of workers.^{2,3}

In 2011, the *Comissão Tripartite de Saúde e Segurança no Trabalho* (CTSST) [Tripartite Commission of Health and Safety at Work] approved the National Policy of Safety and Health at Work, which culminated in the publication of Decree No. 7602 from November 7th, 2011, which provides for the adoption of measures work activities that are upon high risk for work-related illnesses and accidents. This occupational exposure has been a concern manifested by all health professionals and also by hospital institutions that provide specific services to the population that end up bringing overload to workers and expose them to infectious diseases, including direct contact with articles, equipment contaminated with biological material.⁴

Data from the Health Ministry show that the risks of exposure to HIV, HVC and HBV are proportional to the handling of sharps and organic fluids. Human Immunodeficiency Virus (HIV) contamination ranges from 0.3% to 0.5% in percutaneous accidents, being 0.09% after exposure to the mucous membrane; Hepatitis B ranges from 37% to 62% when the source patient has the HbeAg antigen, and between 23% and 37% if the source patient does not have the antigen mentioned, and the Hepatitis C virus ranges from 0 to 7 % after the accident.⁵

A study conducted in *Teresina* city with quantitative-descriptive-retrospective methodology, whose objective was to

know the profile of Work Accidents (WA) among employees of a public hospital from *Teresina*, in 2007, found 53 tokens of notification, the main cause of WA are sharps, with 33 occurrences. Data from this study indicate that the professional categories most exposed to accidents were nursing technicians/assistants (43.4%), general service assistants (28.3%), trainee-academics (15.2%) and nurses (9.4%). The most frequently involved sectors were the emergency department (20.4%), surgical center (12.2%), Intensive Care Unit (ICU) (10.2%), urology (10.2%) and nephrology/yellow room/hemodialysis (10.2%).⁶

Another retrospective exploratory study carried out with a sample of 100 nursing students showed that 41% of accidents occurred in large hospitals, with ICU and syringe needles being the most associated with the occurrence of events. The authors point out that both the causes mentioned and the possible risk factors for accidents reinforce the importance of implementing the *Política Nacional de Educação Permanente em Saúde (PNEPS)* [National Policy of Permanent Health Education], the use of Personal Protective Equipment (PPE) and standard precautions.⁷

In this context, among health workers, different studies show that nursing professionals are the most exposed, because they remain in nursing care for longer, and frequently manipulate potentially contaminated biological materials, especially sharps, to become a serious risk in their workplaces. A literature review on biological risk, in the context of nursing practice, pointed out that among the variables that influenced the occurrence of occupational accidents were stress, rushing, carelessness, non-use of PPE and evening shift.⁸⁻¹¹

A study about the occupational accidents prevalence and involving biological material, and also among the nursing team that compared the results with the records of the Information System for Aggravation Notification and the Communication of Work Accidents (CWA) showed that 53.1% of the reported accidents involved biological material, and 31.2% were registered in the Information System for Aggravation Notification and only 15.6% in the CWA. Venous puncture and inadequate disposal of the material were associated with 52.9% and 47.1% of the accidents, respectively.¹²

Although nursing professionals show an important level of vulnerability to occupational accidents with biological risk, facing the risks inherent to the work activity in the hospital space has been a challenge that should involve different groups of professionals. Such coping should include surveillance, care, and continuing education activities so that those potentially exposed are trained to prevent accidents and avoid health risks.¹³

Given the aforementioned, the study's purpose was to perform a survey regarding the accidents with sharps occurred in an Adult Intensive Care Unit from a Public Hospital at *São Luís* city, *Maranhão* State, over the period from 2009 to 2015, through the hospital notification sheets.

METHODS

It is an exploratory and documental study with a quantitative approach that was carried out in a Public Hospital

at São Luís city, Maranhão State, which is a State of referral for procedures of high complexity in several areas (cardiovascular, traumatic orthopedics, neurosurgery, nephrology, kidney transplantation and Cornea, among others). The Public Hospital develops strategic programs of basic care integrated into the *Sistema Único de Saúde (SUS)* [Unified Health System] network, having 573 beds, 63 of ICU and 22 isolation beds, as well as 16 operating rooms. The ICU of this hospital is a State referral for the care of serious adults, in the following specialties: clinical, surgical and obstetrical, with 15 beds, 1 of isolation, and a multidisciplinary team.

The data collection was initiated only after the approval by the Research Ethics Committee, and consisted of the collection of the historical series of accident notification sheets, during the period from 2009 to 2015, in the Epidemiological Surveillance sector of the hospital. This survey took place from 10/01/2015 to 11/03/2015, in the morning shift and was guided by a standardized form from the Health Ministry. Data sheets for the notification of accidents related to a period other than that defined by the study were excluded, and fichas that did not meet the criteria previously established (incomplete, deleted, ineligible, with another type of notification not related to accident with sharps in the ICU). All the records of accidents of work were analyzed, with a total of 330 and, selected to those referring to accidents with sharps. From the analysis of the records, were obtained, by selected year:

- a) 2009: 46 notification sheets, where 34 were related to accidents with sharps;
- b) 2010: 55 notification sheets, where 48 were related to accidents with sharps;
- c) 2011: 38 notification sheets, where 29 were related to accidents with sharps;
- d) 2012: 32 notification sheets, where 27 were related to accidents with sharps;
- e) 2013: 57 notification sheets, where 30 were related to accidents with sharps;
- f) 2014: 48 notification sheets, where 39 were related to accidents with sharps;
- g) 2015: 54 notification sheets, where 47 were related to accidents with sharps.

By the end of the analysis, a total of 254 files were obtained concerning accidents with sharps.

In order to perform data analysis, the variables of interest to the research were selected, as follows: sex, age, schooling, occupational category, occupation time, type of exposure, organic material, accident circumstances, causative agent, PPE use, vaccine situation, behavior at the accident time and notification. From the notification sheets, a database was built in Microsoft Excel 2013 software, later analyzed in SPSS 13.0, where frequency and averages measures were calculated.

The research project that made this work possible was approved by the Research Ethics Committee from the aforesaid hospital, under the Legal Opinion No. 95/2015, and in accordance with the Resolution No. 466 of December 12th, 2012 from the National Health Council/Health Ministry, which has guidelines and regulations that conducts researches involving human beings.

RESULTS AND DISCUSSION

When analyzing the notification sheets, during the period from 2009 to 2015, it was observed that, in relation to gender, female predominance was observed, ranging from 75% to 87.1%, and the age group in which the accidents are between 28 and 38 years old, followed by those between 18 and 28 years old (**Table 1**). These data are similar to the data from the study conducted in a University Hospital from the Federal Public Network at *Rio de Janeiro* city, where the professionals who were female (82%), and were between 21 and 30 years old (41.5%), followed by professionals between 31 and 40 years old (26.5%).¹⁴

One possible explanation is that we have a large number of female workers in the area. Considering the age, it is possible to notice a predominance of accidents in younger age groups, which can be due to inexperience at the beginning of the profession, where skill, agility and attention are paramount in performing tasks that expose the professional to occupational hazards.

In terms of schooling, professionals with the highest levels of education had a high level of education in 2010 (62.5%) and in 2009 (52.9%), followed by those with higher education with 44.4% in 2012 and 36.6% in 2013 (**Table 1**). Data that resembled a study carried out in *Maranhão* State about accidents involving biological material, which showed that the professionals who were most affected had a mean level of schooling, representing 59.7% in 2009 and 58.0% in 2010.³

Regarding the occupation, for most of the analyzed years the majority of the injured were technical nursing professionals, with the highest incidence in 2010 (54.5%) and in 2015 (63.8%), followed by cleaners whose highest rates were in 2013 (30%). Results that approximate a study carried out in a philanthropic hospital in *Minas Gerais* State, where 76.5% of the injured were nursing technicians, then representing the majority.¹²

It should be noted that in 2013 the rate of accidents with cleaning staff exceeded the rate of nursing technicians reaching 30% (**Table 1**). This information draws attention and raises the need for this professional category to be more included in actions aimed at preventing occupational injuries, especially with biological material.

When the occupation time was evaluated, it was observed that the majority of the accident victims had, in average, up to 5 years of work in the profession, with higher accident rates in 2009 (58.8%) and 2014 (56.4%), followed by those working in the profession, between 5 and 10 years, with the highest accident rate in the year 2015 (55.3%) (**Table 1**). When linking service time and occurrence of accidents, research indicates a greater susceptibility to accidents of professionals with less experience time ranging from 1 to 5 years.¹⁵⁻¹⁷

Health professionals with longer service hours become tend to experiment more accidents, since the longer the worker performs his activity, the less he attaches importance to the biological risk and the protective measures, because he believes that the technical ability and never having suffered an accident less susceptible.¹⁸

Table 1 - Profile of accidents with sharps in a hospital from the *São Luís* city: Population socio-demographic characteristics. *São Luís-MA*

| | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | |
|------------------------------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|
| | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| SEX | | | | | | | | | | | | | | |
| Male | 7 | 20.59 | 9 | 18.75 | 7 | 24.14 | 5 | 18.52 | 7 | 23.33 | 5 | 12.82 | 9 | 19.15 |
| Female | 27 | 79.41 | 39 | 81.25 | 22 | 75.86 | 22 | 81.48 | 23 | 76.67 | 34 | 87.18 | 38 | 80.85 |
| Total | 34 | 100 | 48 | 100 | 29 | 100 | 27 | 100 | 30 | 100 | 39 | 100 | 47 | 100 |
| AGE | | | | | | | | | | | | | | |
| 18 to 28 years old | 9 | 26.47 | 10 | 20.83 | 4 | 13.79 | 7 | 25.93 | 12 | 40 | 15 | 38.46 | 7 | 14.89 |
| 28 to 38 years old | 14 | 41.18 | 26 | 54.17 | 16 | 55.17 | 10 | 37.04 | 8 | 26.67 | 15 | 38.46 | 24 | 51.06 |
| 38 to 48 years old | 9 | 26.47 | 6 | 12.5 | 6 | 20.69 | 7 | 25.93 | 3 | 10 | 8 | 20.51 | 12 | 25.53 |
| 48 to 58 years old | 2 | 5.88 | 6 | 12.5 | 2 | 6.9 | 1 | 3.7 | 3 | 10 | 1 | 2.56 | 4 | 8.51 |
| More than 58 y/o | 0 | 0 | 0 | 0 | 1 | 3.45 | 1 | 3.7 | 4 | 13.33 | 0 | 0 | 0 | 0 |
| Not specified | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3.7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 34 | 100 | 48 | 100 | 29 | 100 | 27 | 100 | 30 | 100 | 39 | 100 | 47 | 100 |
| SCHOOLING | | | | | | | | | | | | | | |
| Incomplete Elementary School | 1 | 2.94 | 1 | 2.08 | 3 | 10.34 | 0 | 0 | 1 | 3.33 | 0 | 0 | 1 | 2.13 |
| Complete Elementary School | 0 | 0 | 0 | 0 | 1 | 3.45 | 0 | 0 | 1 | 3.33 | 0 | 0 | 2 | 4.26 |
| Incomplete High School | 1 | 2.94 | 1 | 2.08 | 0 | 0 | 1 | 3.7 | 1 | 3.33 | 1 | 2.56 | 0 | 0 |
| Complete High School | 18 | 52.94 | 30 | 62.5 | 15 | 51.72 | 14 | 51.85 | 14 | 46.67 | 18 | 46.15 | 24 | 51.06 |
| Incomplete College | 5 | 14.71 | 8 | 16.67 | 2 | 6.9 | 0 | 0 | 2 | 6.67 | 14 | 35.9 | 6 | 12.77 |
| Complete College | 9 | 26.47 | 8 | 16.67 | 8 | 27.59 | 12 | 44.44 | 11 | 36.67 | 6 | 15.38 | 14 | 29.79 |
| Total | 34 | 100 | 48 | 100 | 29 | 100 | 27 | 100 | 30 | 100 | 39 | 100 | 47 | 100 |
| OCCUPATION | | | | | | | | | | | | | | |
| Cleaners Staff | 7 | 20.59 | 7 | 15.91 | 5 | 17.24 | 5 | 18.52 | 9 | 30 | 7 | 17.95 | 9 | 19.15 |
| Nursing Auxiliary | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 7.41 | 2 | 6.67 | 2 | 5.13 | 0 | 0 |
| Nursing Technician | 16 | 47.06 | 24 | 54.55 | 15 | 51.72 | 10 | 37.04 | 8 | 26.67 | 13 | 33.33 | 30 | 63.83 |
| Laboratory Technician | 0 | 0 | 1 | 2.27 | 1 | 3.45 | 0 | 0 | 0 | 0 | 1 | 2.56 | 1 | 2.13 |
| Nursing Student | 1 | 2.94 | 1 | 2.27 | 0 | 0 | 0 | 0 | 1 | 3.33 | 3 | 7.69 | 0 | 0 |
| Medicine Student | 3 | 8.82 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3.33 | 3 | 7.69 | 0 | 0 |
| Odontology Student | 0 | 0 | 6 | 13.64 | 1 | 3.45 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2.13 |
| Pharmacy Student | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3.33 | 0 | 0 | 0 | 0 |
| Médico | 4 | 11.76 | 4 | 9.09 | 4 | 13.79 | 5 | 18.52 | 6 | 20 | 4 | 10.26 | 1 | 2.13 |
| Nurse | 3 | 8.82 | 1 | 2.27 | 3 | 10.34 | 4 | 14.81 | 2 | 6.67 | 4 | 10.26 | 5 | 10.64 |
| Physiotherapist | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3.7 | 0 | 0 | 2 | 5.13 | 0 | 0 |
| Total | 34 | 100 | 44 | 100 | 29 | 100 | 27 | 100 | 30 | 100 | 39 | 100 | 47 | 100 |
| TIME OF OCCUPATION | | | | | | | | | | | | | | |
| 0 to 5 years | 20 | 58.82 | 22 | 45.83 | 14 | 48.28 | 12 | 44.44 | 11 | 36.67 | 22 | 56.41 | 8 | 17.02 |
| 5 to 10 years | 7 | 20.59 | 8 | 16.67 | 4 | 13.79 | 6 | 22.22 | 4 | 13.33 | 4 | 10.26 | 26 | 55.32 |
| 10 to 15 years | 1 | 2.94 | 3 | 6.25 | 3 | 10.34 | 2 | 7.41 | 1 | 3.33 | 1 | 2.56 | 6 | 12.77 |
| 15 to 20 years | 0 | 0 | 3 | 6.25 | 3 | 10.34 | 1 | 3.7 | 1 | 3.33 | 1 | 2.56 | 7 | 14.89 |
| 20 to 25 years | 3 | 8.82 | 4 | 8.33 | 1 | 3.45 | 0 | 0 | 2 | 6.67 | 2 | 5.13 | 0 | 0 |
| 25 to 30 years | 0 | 0 | 4 | 8.33 | 0 | 0 | 0 | 0 | 1 | 3.33 | 1 | 2.56 | 0 | 0 |
| More than 30 years | 0 | 0 | 0 | 0 | 3 | 10.34 | 1 | 3.7 | 2 | 6.67 | 0 | 0 | 0 | 0 |
| Not specified | 3 | 8.82 | 4 | 8.33 | 1 | 3.45 | 5 | 18.52 | 8 | 26.67 | 8 | 20.51 | 0 | 0 |
| Total | 34 | 100 | 48 | 100 | 29 | 100 | 27 | 100 | 30 | 100 | 39 | 100 | 47 | 100 |

Source: Hospital Notification Sheets from the Epidemiology Center under study.

Concerning the accidents' circumstances, it was noticed that in most cases the accident victims were performing some procedure when the accident occurred, the main ones being: inadequate disposal of material (43.3% in 2013), punctures (22.2% in 2012), and various procedures (surgical, dental, laboratory, 20.5% - in 2009) (Table 2).

A study carried out in three higher education institutions in Curitiba city, Brazil, showed that 27% of accidents occurred during venous punctures.¹⁹ In another study, 47% of accidents occurred in the disposal of the material used.¹² Like a study in Minas Gerais showed that there was a predominance of accidents due to improper disposal of sharps.¹⁰

Another study with a quantitative approach with data collected from the *Sistema Nacional de Agravos de Notificação (SINAN/NET)* [National System for Aggravation Notification] found that the improper disposal of sharps was the main cause of notification in both 2009 and 2010.³

Regarding the PPE use, most of the accident victims used protective equipment throughout the analyzed period, with a higher rate of use in 2010, whose adherence was 95.8% among the accident victims. However, this percentage did not remain constant, and in 2015, only 51% used the equipment (Table 2).

In other studies, we have found that most (70.5%) of the injured workers were using PPE¹² and 71% of workers said they were using some type of PPE in the moment of the accident, such as: gloves, apron, mask, glasses, among others.¹⁹

When analyzing the causative agent, it was seen that the needles remain the main objects involved in accidents, the highest index was in 2011 with 72.4% of occurrences; having dropped in 2014 with 41% of the cases. The blades then came with the highest index in 2014, with 20.5% of the occurrences (Table 2). Several studies have shown a predominance of occupational accidents involving needles and blades, with high occurrence rates.^{7,20-1}

In the analysis of the type of exposure, Figure 1 shows the number of professionals who suffered accidents according to exposure. It is noticed that, the percutaneous exposure presents a great incidence, having more record in 2015, with 43 (91,4%) cases; the lowest occurrence year was 2012, with 21 (77%) cases. The exposure of mucosa, then comes with its highest in 2010, with 8 (16.6%) cases. Skin exposure had a higher incidence in 2010, with 4 (8.3%) cases, with no records in the years 2009 and 2015. Regarding the other types of exposure, there were no accidents recorded in the years studied.

Analyzing the organic material, it was observed that blood had a higher proportion (87.2%) in 2015 (Table 2). Similar data were obtained in other studies, reporting high percentages (83.8% to 86.5%) of blood exposure among the injured.²²⁻³

Considering the prophylactic conduct, it was observed that among the accident victims the majority did not need to use any type of chemoprophylaxis, and in 2015 the highest proportion of non-indication (78.7%) was evidenced. Nevertheless, in 2011, 19.1% of injured professionals needed to use a prophylactic regimen (AZT + 3TC) for HIV, with a higher rate. It is also worth noting the refusal of chemoprophylaxis around 5 to 16% in almost all the years studied (Table 2).

Regarding the Hepatitis B vaccination schedule, the majority (60% to 85.2%) of the victims had a complete vaccination schedule (three doses), being more expressive in 2009 and less in 2013 (Table 2). These data are in agreement with other studies^{14,24-5} that report that the majority of professionals injured with biological material had a complete vaccination schedule.

Another relevant data is related to the known source patient, where in most of the accident victims, in all years, there was a record of a known source. However, in 2014, there was the largest registry of unknown sources, with 28.2% of the records, with a significant decrease in the subsequent year (10.6%) (Table 2). Identifying the source patient is important for decision-making regarding the prophylaxis to be adopted in case of exposure.

In cases of HIV infection, studies have shown that zidovudine (AZT) prophylaxis has been associated with an 81% reduction in transmission rates.²⁶ Schemes with either two or three antiretroviral drugs are currently recommended, depending on the serological and immunological status of the source patient or the risks involved in the accident. In cases of unknown source-patient and some risk factor (deep lesion, prior needle in the patient's vein or artery, among others), it is recommended to prescribe a double antiretroviral regimen for 28 days. When the source patient is known to be HIV-positive or the HIV rapid test is positive, the injured person should receive expanded antiretroviral therapy with three medications.⁵

When the source patient has a diagnosis of Hepatitis B (HBsAg-positive) or a suspected hepatitis, the injured person should receive human hyperimmune immunoglobulin preferably within the first 24 hours (up to 48 hours) after the accident. Immunoglobulin administration may be given up to the 7th day after the event.⁵

Analyzing the CWA issue, the largest registry occurred in 2009, with 82.3% of cases, followed by 2015, with 78.7% of cases; the lowest register was in 2013, with 20% of cases. Underreporting was observed in 2013, with 76.6% of cases ignored and, in 2014, with 46% of CWA not issued (Table 2).

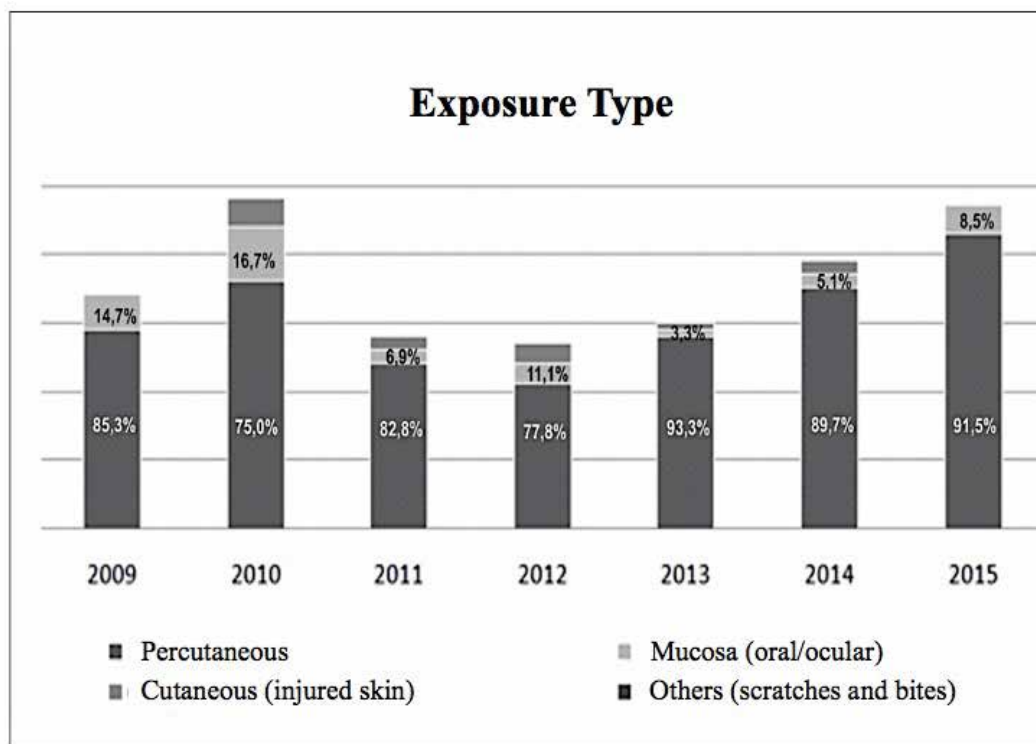
Table 2 - Profile of accidents with sharps in a hospital from the São Luís city: Characteristics of the accidents with sharps. São Luís-MA

| | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | |
|---|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|
| | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| ACCIDENTS CIRCUMSTANCES | | | | | | | | | | | | | | |
| Adm. of medication | 2 | 5.88 | 4 | 8.33 | 3 | 10.34 | 3 | 11.11 | 5 | 16.67 | 5 | 12.82 | 7 | 14.89 |
| Puncture | 5 | 14.71 | 7 | 14.58 | 4 | 13.79 | 6 | 22.22 | 2 | 6.67 | 5 | 12.82 | 6 | 12.77 |
| Inappropriate material disposal | 9 | 26.47 | 9 | 18.75 | 7 | 24.14 | 7 | 25.93 | 13 | 43.33 | 13 | 33.33 | 15 | 31.91 |
| Material washing | 2 | 5.88 | 3 | 6.25 | 4 | 13.79 | 2 | 7.41 | 1 | 3.33 | 1 | 2.56 | 3 | 6.38 |
| Handling of a box with sharps | 2 | 5.88 | 4 | 8.33 | 1 | 3.45 | 2 | 7.41 | 1 | 3.33 | 1 | 2.56 | 2 | 4.26 |
| Procedures (surgical, dental, lab.) | 7 | 20.59 | 5 | 10.42 | 3 | 10.34 | 3 | 11.11 | 4 | 13.33 | 5 | 12.82 | 7 | 14.89 |
| <i>Dextro</i> | 2 | 5.88 | 4 | 8.33 | 1 | 3.45 | 2 | 7.41 | 1 | 3.33 | 3 | 7.69 | 2 | 4.26 |
| Reattach | 2 | 5.88 | 4 | 8.33 | 2 | 6.9 | 1 | 3.7 | 2 | 6.67 | 4 | 10.26 | 4 | 8.51 |
| Others | 3 | 8.82 | 8 | 16.67 | 4 | 13.79 | 1 | 3.7 | 1 | 3.33 | 2 | 5.13 | 1 | 2.13 |
| Total | 34 | 100 | 48 | 100 | 29 | 100 | 27 | 100 | 30 | 100 | 39 | 100 | 47 | 100 |
| PPE USE | | | | | | | | | | | | | | |
| Yes | 28 | 82.35 | 46 | 95.83 | 25 | 86.21 | 21 | 77.78 | 26 | 86.67 | 35 | 89.74 | 24 | 51.06 |
| No | 6 | 17.65 | 2 | 4.17 | 4 | 13.79 | 6 | 22.22 | 4 | 13.33 | 4 | 10.26 | 23 | 48.94 |
| Total | 34 | 100 | 48 | 100 | 29 | 100 | 27 | 100 | 30 | 100 | 39 | 100 | 47 | 100 |
| CAUSING AGENT | | | | | | | | | | | | | | |
| Blade/lancet | 4 | 11.76 | 4 | 8.33 | 2 | 6.9 | 2 | 7.41 | 4 | 13.33 | 8 | 20.51 | 9 | 19.15 |
| Needle with lumen | 16 | 47.06 | 31 | 64.58 | 21 | 72.41 | 12 | 44.44 | 16 | 53.33 | 16 | 41.03 | 21 | 44.68 |
| Needle without lumen | 3 | 8.82 | 1 | 2.08 | 2 | 6.9 | 4 | 14.81 | 4 | 13.33 | 4 | 10.26 | 1 | 2.13 |
| Intracath | 2 | 5.88 | 0 | 0 | 0 | 0 | 1 | 3.7 | 1 | 3.33 | 2 | 5.13 | 0 | 0 |
| Glasses | 2 | 5.88 | 4 | 8.33 | 1 | 3.45 | 2 | 7.41 | 1 | 3.33 | 3 | 7.69 | 5 | 10.64 |
| Scalp | 2 | 5.88 | 4 | 8.33 | 0 | 0 | 1 | 3.7 | 1 | 3.33 | 1 | 2.56 | 3 | 6.38 |
| Jelco catheter | 3 | 8.82 | 2 | 4.17 | 1 | 3.45 | 2 | 7.41 | 2 | 6.67 | 3 | 7.69 | 3 | 6.38 |
| Others | 2 | 5.88 | 2 | 4.17 | 2 | 6.9 | 3 | 11.11 | 1 | 3.33 | 2 | 5.13 | 5 | 10.64 |
| Total | 34 | 100 | 48 | 100 | 29 | 100 | 27 | 100 | 30 | 100 | 39 | 100 | 47 | 100 |
| ORGANIC MATERIAL | | | | | | | | | | | | | | |
| Blood | 29 | 85.29 | 36 | 75 | 22 | 75.86 | 20 | 74.07 | 22 | 73.33 | 30 | 76.92 | 41 | 87.23 |
| Cerebrospinal fluid | 0 | 0 | 2 | 4.17 | 0 | 0 | 2 | 7.41 | 1 | 3.33 | 1 | 2.56 | 1 | 2.13 |
| Pleural fluid | 0 | 0 | 0 | 0 | 1 | 3.45 | 0 | 0 | 0 | 0 | 2 | 5.13 | 0 | 0 |
| Ascitic fluid | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3.7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Amniotic Fluid | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fluid with blood | 1 | 2.94 | 1 | 2.08 | 2 | 6.9 | 2 | 7.41 | 2 | 6.67 | 2 | 5.13 | 0 | 0 |
| Serum/Plasma | 0 | 0 | 1 | 2.08 | 0 | 0 | 0 | 0 | 2 | 6.67 | 2 | 5.13 | 2 | 4.26 |
| Others | 4 | 11.76 | 8 | 16.67 | 4 | 13.79 | 2 | 7.41 | 3 | 10 | 2 | 5.13 | 3 | 6.38 |
| Total | 34 | 100 | 48 | 100 | 29 | 100 | 27 | 100 | 30 | 100 | 39 | 100 | 47 | 100 |
| APPROACH REGARDING THE PROPHYLAXIS | | | | | | | | | | | | | | |
| No indication for drug treatment | 20 | 58.82 | 31 | 64.58 | 19 | 65.52 | 10 | 37.06 | 19 | 65 | 15 | 38.46 | 37 | 78.72 |
| Refused indicated drug treatment | 2 | 11.28 | 1 | 10.38 | 0 | 0 | 4 | 16 | 1 | 5 | 4 | 16.35 | 0 | 0 |
| Started AZT+3TC | 4 | 11.76 | 6 | 12.5 | 5 | 19.1 | 5 | 18.38 | 5 | 18.33 | 7 | 17.95 | 1 | 2.13 |
| Started immunoglobulin against Hepatitis B (HBIG) | 2 | 5.9 | 2 | 4.2 | 0 | 0 | 2 | 13.43 | 0 | 0 | 4 | 12.36 | 0 | 0 |
| Started vaccine contra against Hepatitis B | 3 | 12.24 | 4 | 8.34 | 2 | 7.76 | 3 | 15.13 | 3 | 11.67 | 5 | 14.88 | 9 | 19.15 |
| Total | 31 | 100 | 44 | 100 | 26 | 100 | 24 | 100 | 28 | 100 | 35 | 100 | 47 | 100 |

| | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | | 2014 | | 2015 | |
|---|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|
| | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| REGARDING THE VACINAL SCHEME AGAINST HEPATITIS B | | | | | | | | | | | | | | |
| Complete scheme | 29 | 85.29 | 35 | 72.92 | 21 | 72.41 | 19 | 70.37 | 18 | 60 | 26 | 66.67 | 34 | 72.34 |
| Incomplete scheme | 0 | 0 | 1 | 2.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 8.51 |
| No dose | 5 | 14.71 | 10 | 20.83 | 4 | 13.79 | 6 | 22.22 | 6 | 20 | 8 | 20.51 | 9 | 19.15 |
| Ignored | 0 | 0 | 2 | 4.17 | 4 | 13.79 | 2 | 7.41 | 6 | 20 | 5 | 12.82 | 0 | 0 |
| Total | 34 | 100 | 48 | 100 | 29 | 100 | 27 | 100 | 30 | 100 | 39 | 100 | 47 | 100 |
| PATIENT UNKNOWN SOURCE | | | | | | | | | | | | | | |
| Yes | 23 | 67.65 | 35 | 72.92 | 21 | 72.41 | 16 | 59.26 | 18 | 60 | 22 | 56.41 | 20 | 42.55 |
| No | 8 | 23.53 | 9 | 18.75 | 4 | 13.79 | 3 | 11.11 | 8 | 26.67 | 11 | 28.21 | 5 | 10.64 |
| Ignored | 3 | 8.82 | 4 | 8.33 | 4 | 13.79 | 8 | 29.63 | 4 | 13.33 | 6 | 15.38 | 22 | 46.81 |
| Total | 34 | 100 | 48 | 100 | 29 | 100 | 27 | 100 | 30 | 100 | 39 | 100 | 47 | 100 |
| CWA ISSUING | | | | | | | | | | | | | | |
| Yes | 28 | 82.35 | 39 | 81.25 | 12 | 41.38 | 9 | 33.33 | 6 | 20 | 12 | 30.77 | 37 | 78.72 |
| No | 4 | 11.76 | 3 | 6.25 | 4 | 13.79 | 12 | 44.44 | 1 | 3.33 | 18 | 46.15 | 10 | 21.28 |
| Ignored | 2 | 5.88 | 6 | 12.5 | 13 | 44.83 | 6 | 22.22 | 23 | 76.67 | 9 | 23.08 | 0 | 0 |
| Total | 34 | 100 | 48 | 100 | 29 | 100 | 27 | 100 | 30 | 100 | 39 | 100 | 47 | 100 |

Source: Hospital Notification Sheets from the Epidemiology Center under study.

Figure 1 - Profile of accidents with sharps in a hospital from the *São Luís* city: Characteristics of the type of exposure to sharps. *São Luís-MA* (2016)



Source: Hospital Notification Sheets from the Epidemiology Center under study.

Underreporting has worried health authorities, then making it a challenge for work safety management team. Many findings show that underreporting rates of occupational accidents are high, as can be seen in these examples: a study that evaluated 118 reporting forms concluded that only 22% issued CWA and 75% did not, 20 another study noted the drop

(59.09%), 2009 (31.82%) and, 2010 (9.09%), in a municipality from the *Rio Grande do Sul* State, after the collection of secondary data, in the workers' medical records.²⁷

The underreporting is due to the failure to complete and issue the CWA, after the accident with biological material, among workers and, despite its importance, unfortunately,

most of the time, is ignored and/or incomplete. There are several reasons for this, such as the lack of knowledge about the compulsory nature of the procedure, the characterization of the episode as an accident, and the fear of the worker injured in the notification, among others.²⁰ The work accident due to compulsory notification must be notified, including the issuance of CWA, which favors the planning of actions aimed at the prevention of diseases and/or injuries, and the promotion of workers' health.

CONCLUSION

The present study reveals that accidents with sharps occur in a greater proportion with women, younger professionals with a high level of schooling, the most vulnerable being nursing technicians and cleaners staff, and also reaching those with less professional experience. The circumstances of the accidents are susceptible to prevention and control, as they involve improper disposal of material and venous punctures; besides occurring in the handling of the needles and scalpel blades, the objects most involved in the accidents; percutaneous exposure accounts for most accidents, with blood being the most present organic material.

It is important to note that the majority of professionals exposed to biological materials used PPE; there was no need to intervene with chemoprophylaxis; there was a record of a known source; and the CWA was issued. Nonetheless, it should be noted that in 2011, 19% of the victims had to use a prophylactic HIV regimen and that for all the years studied, there was a percentage of refusal of the indicated chemoprophylaxis.

This study, in addition to showing the need for investments in the prevention and control of accidents with sharps, also points to the variability of some characteristics in the indicated period, such as use of PPE, CWA emission, use of prophylaxis and its refusal, and known patient-source. Another interesting fact that should subsidize measures of continuous training of professionals is the inclusion, or emphasizing with the cleaning staff.

Herein, it is wanted to emphasize the concern with the occurrence of accidents with biological materials, where the professional is subject to infections by pathogens, which can lead to various health problems, including psychological trauma, that contribute to change their working life, social and family.

The results obtained in this study are intended to identify the factors that increase the risks of accidents with biological materials, as well as the circumstances that require greater control and vigilance. It also intends to collaborate with other researches that approach the subject, in the search for means that reinforce the importance of biosafety measures within the work environment, then ensuring quality assistance.

REFERENCES

1. Brasil. Ministério da Saúde. Secretaria de Ciência, Tecnologia e Insumos Estratégicos. Departamento de Ciência e Tecnologia. Classificação de risco dos agentes biológicos. Brasília: Ministério da Saúde; 2006.

2. Santana VS, Moura MCP, Soares J, Guedes MH. Acidentes de trabalho no Brasil: dados de notificação do Sinan 2007. Brasília: Ministério da Saúde; 2009 [acesso em ago 2015]. Disponível em: http://bvms.saude.gov.br/bvms/artigos/relatorio_sinan_2007_08.pdf
3. Gonçalves PM, Belfort IK, Fernandes MA, Monteiro SCM, Sousa WR, Martins R. Análise da Estatística de Acidentes com Exposição de Material Biológico no Maranhão nos anos 2009-2010. *Rev Pesq Saúde* 2014; 15(3):360-63.
4. Brandao Junior PS. Biossegurança e AIDS: as dimensões psicossociais do acidente com material biológico no trabalho hospitalar. Rio de Janeiro. Dissertação [Mestrado em Ciências na área da Saúde Pública] – Fundação Oswaldo Cruz; 2000.
5. Brasil. Ministério da Saúde. Recomendações par atendimento e acompanhamento de exposição ocupacional à material biológico: HIV e Hepatite B e C. Brasília: Ministério da Saúde; 2004.
6. Ribeiro PC, Ribeiro ACC, Lima Júnior FPB. Perfil dos acidentes de trabalho em um hospital de Teresina, PI. *Cogitare Enferm* 2010; 15:110-6.
7. Nowak NL, Campos GA, Borba E de O, Ulbricht L, Neves EB. Fatores de risco para acidentes com materiais perfurocortantes. *O Mundo da Saúde* 2013; 37(4):419-26.
8. Bakke HA, Araújo NMC. Acidente de trabalho com profissionais de saúde de um hospital universitário. *Produção* 2010 [acesso em jul 2016]; 20(4):669-76. Disponível em: www.scielo.br/pdf/prod/v20n4/aop00040109.pdf
9. Oliveira AC, Paiva MHRS. Análise dos acidentes ocupacionais com material biológico entre profissionais em serviços de atendimento pré-hospitalar. *Rev. Latino-Am. Enfermagem* 2013; 2(1):7.
10. Julio RS, Filardi MBS, Marziale MHP. Acidentes de trabalho com material biológico ocorridos em municípios de Minas Gerais. *Rev Bras Enferm* 2014; 67(1):119-26.
11. Amaro Júnior AS, Custódio JMO, Rodrigues VPS, Nascimento JMO do. Risco biológico no contexto da prática de Enfermagem: uma análise de situações favorecedoras. *Rev. Epidemiol Control Infect* 2015; 5(1):42-6.
12. Gusmão GS, Oliveira AC, Gama CS. Acidente de Trabalho com Material Biológico: análise da ocorrência e do registro. *Cogitare Enferm* 2013; 18(3):558-64.
13. Nishide VM, Benatti MCC. Riscos ocupacionais entre trabalhadores de Enfermagem de uma Unidade de Terapia Intensiva. *Rev. Esc. Enferm* 2004 [acesso em ago 2016]; 38(4):406-14. Disponível em: http://www.scielo.br/scielo.php?pid=SOO80_62342004000400006&script
14. Coury AF, Silva Júnior OC. Acidentes Ocupacionais com Material Biológico num Hospital Universitário do Rio de Janeiro. *Rev. de Pesq.: cuidado é fundamental* 2010; 2(1):515-21.
15. Moura JP, Gir E, Canini SRM da S. Acidentes ocupacionais com material perfurocortante em um Hospital Regional de Minas Gerais, Brasil. *Revista Ciência y Enfermería, Concepcion* 2006; 12(1):29-7.
16. Oliveira AC, Lopes ACS, Paiva MHRS. Acidentes ocupacionais por exposição a material biológico entre a equipe multiprofissional do atendimento pré-hospitalar. *Rev. Esc Enferm* 2009; 43(3):677-83.
17. Negri ACG. Exposição a materiais biológicos: acidentes de trabalho atendidos em hospital universitário de Campo Grande/MS. Campo Grande. Dissertação [Programa de Pós-Graduação em Saúde e Desenvolvimento na Região Centro-Oeste]. Universidade Federal do Mato Grosso do Sul; 2012.
18. Caixeta RB, Barbosa-Branco A. Acidente de trabalho com material biológico, em profissionais de saúde de hospitais públicos do Distrito Federal, Brasil. 2002/2003. *Cadernos de Saúde Pública* 2005; 21(3):737-46.
19. Vieira M, Padiha MI, Pinheiro RDC. Análise dos acidentes com material biológico em trabalhadores da saúde. *Rev. Latino-Am. Enfermagem* 2011; 19(2).
20. Jagger J, Berguer R, Phillips EK, Parker G, Goma AE. Increase in Sharps Injuries in Surgical Settings Versus Nonsurgical Settings after Passage of National Needlestick Legislation. *J Am Coll Surgeons* 2010; 210(4):496-02.
21. Sharma GK, Gilson MM, Nathan H, Makary MA. Needlestick Injuries among Medical Students: Incidente and Implications. *Acad Med* 2009; 84(12):1815-21.

22. Amorim IG, Bispo M de M, Ribeiro LM, Mendonça AEO de, Moraes ROB de, Amorim EG. Caracterização dos Acidentes com Exposição a Material Biológico Envolvendo a Equipe de Enfermagem de um Hospital Universitário. *Revista da Universidade Vale do Rio Verde* 2014; 12(1):811-19.
23. Silva TR, Rocha AS, Ayres JA, Juliani CMCM. Acidente com material perfurocortante entre profissionais de Enfermagem de um hospital universitário. *Revista Gaúcha de Enfermagem* 2010; 31(4).
24. Lima LM, Oliveira CC, Rodrigues KMR. Exposição ocupacional por material biológico no Hospital Santa Casa de Pelotas – 2004 a 2008. *Esc. Anna Nery* 2011; 15(1):96-102.
25. Silva GS, Almeida AJ, Paula VS, Villar LM. Conhecimento e utilização de medidas de precaução-padrão por profissionais de saúde. *Esc. Anna Nery* 2012; 16(1):103-10.
26. Cardo DM, Culver DH, Ciesielski CA, Srivastava PU, Marcus R, Abiteboul D, et al. A Case-Control Study of HIV Seroconversion in Health Care Workers after Percutaneous Exposure. *New England Journal of Medicine* 1997; 337(21):1485-90.
27. Diehl DT, Rosa K, Rosa SS, Krug SBF. Notificações de acidentes de trabalho com material biológico: um estudo no município de Santa Cruz do Sul/RS. *Rev Epidemiol Control Infect* 2012; 2(3):85-8.

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