

CHARACTERIZATION OF ACCIDENTS WITH BIOLOGICAL MATERIAL BETWEEN HEALTH PROFESSIONALS FROM 2013 TO 2017¹

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ABSTRACT

Objectives: to characterize work accidents with biological material according to the type of exposure and to describe the profile of health care professionals who suffered these accidents. **Method:** cross-sectional and retrospective epidemiological study. A total of 1,269 reports of occupational accidents with biological material were collected through the SINAN and analyzed through descriptive and inferential statistics. For the analysis of association between the selected variables, the chi-square test and Pearson's correlation were used. **Results:** it was identified that the type of exposure is directly related to the accident, time performing the work, and the causer agent of the accident, with a predominance of females, in young adults, with high school education, in the nursing area, with professional experience equal to or less than 5 years. **Conclusion:** the importance of good practices, such as the use of personal protective equipment and vaccination schedule, also the follow-up of post-exposure of professionals to work environment accidents with biological material, with the primary purpose of promoting worker health and safety and the risk management in institutions are emphasized.

Keywords: Occupational Health Nursing. Risk Management. Occupational Health Services. Containment of Biohazards.

INTRODUÇÃO

Health workers are the main involved in Accidents of Work with Biological Material (ATMB)^(1,2,3), defined by Law No. 8,213 as accidents that occur due to work, causing bodily injury or functional disturbance, causing death, incapacities and losses in social, family and work relations⁽⁴⁾, being an important public health problem, causing economic and social damages to the professionals involved⁽⁵⁾.

Brazil ranks fourth in the ranking of work-related accidents, which in the year 2013 generated costs of US \$ 7 billion for the country⁽¹⁾, with workers in the nursing area are the professionals that most experience accidents with materials biological, since it constitutes the largest group of professionals with an employment relationship in hospital and those with greater contact with individuals who need care⁽⁶⁾.

The main reasons for the ATMB are related mainly to the complexity of the activities

performed in the provision of services, working conditions and low adherence of individuals to preventive strategies, such as the proper disposal of sharps and the use of Personal Protective Equipment (PPEs)⁽⁵⁾.

In Brazil, the Regulatory standard (NR) No. 32, which deals with health and safety at work in Health Services in order to avoid or minimize errors, and possibly ATMB has been ineffective considering the low rates of adherence, underreporting and difficulties of inspection by the responsible organs^(7,8).

The ATMB can occur through exposure of the individual to potentially contaminated fluids, percutaneous exposure to sharps, as well as to mucous membranes with ruptured skin integrity, exposing the worker to infectious diseases such as Hepatitis B (HBV), Hepatitis C (HCV) and the Human Immunodeficiency Virus (HIV)⁽⁸⁾.

Immediately after the ATMB, the individual must complete the Work Accident Notice (CAT) so that, afterwards, he/she receives appropriate assistance, being the institution where the server

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acts responsible for referral to the specialized service and completing the Report of Injury Information System (SINAN)⁽⁹⁾. Thus, it is necessary that the worker receive the prophylactic measures in a short period of time, minimizing the risk of transmission of injuries^(10,11).

Thus, knowing the characteristics of work accidents with biological material represents an important management tool for hospital institutions to improve working conditions and reduce occupational risks, providing subsidies for the planning of preventive actions directed at the causes of these occurrences⁽⁹⁾.

In this context, the aim of this research is to contribute to the knowledge in the area of worker health, in the scope of risk management, aiming at later, to plan and implement measures that prevent health problems of these professionals, through a line history of reported accidents, triggering actions directly related to the issues highlighted.

Facing this, the guiding question of the present research was: What are the characteristics of ATMB in health professionals regarding the type of exposure?

To do so, the objectives of the study were: 1) to characterize the ATMB according to the type of exposure; and 2) describe the profile of healthcare professionals who suffered from ATMB.

METHODOLOGY

Cross-sectional and retrospective epidemiological study involving ATMB occurring in a municipality located in the western region of the state of Paraná and reported in the SINAN, from 2013 to 2017.

SINAN aims to collect, transmit and disseminate data generated in the routine of the epidemiological surveillance system, facilitating the formulation and evaluation of health policies, plans and programs, supporting the decision-making process⁽¹²⁾. Data entry in SINAN is done through the use of standardized forms, which are the report and investigation forms, specific to each event.

Data were collected by the researcher directly in the SINAN database through the Municipal Health Department (SESAU), from April to May

2018, and the population was composed of 1,269 reports, of which 100% were constituted the sample of the present study, coming from all the health facilities of a municipality located in the western region of the state of Paraná.

All the report forms containing the variables to be analyzed were included in the study period, without any losses that did not meet the inclusion criteria and which would automatically be excluded.

The guiding tool for data collection was the nationally used to report cases of occupational accidents with exposure to biological material, made available by the Ministry of Health (MS).

The variables analyzed were: age, gender, schooling, occupation, time performing the work, type of exposure, accident circumstance, agent, use of PPE, known source or not, and case evolution (outcome).

The obtained data were inserted and stored in spreadsheet created in Microsoft Office Excel® software, version 2016. Data analysis was performed through descriptive and inferential statistics in the same technological apparatus, counting on the advice of a professional specialized in the area, being presented through the use of figures and tables.

The chi-square test and Pearson's correlation⁽¹³⁾ were used to analyze the association between the selected variables (type of exposure X circumstance of accident, type of exposure X time performing the work and type of exposure X agent). The critical value of the pre-established level of significance was 0.05, using the p-value as the decision rule for hypotheses.

The research project was approved by the Ethics Committee of the State University of the West of Paraná - UNIOESTE, under CAAE No. 50066815.8.0000.0107 and favorable opinion No. 1,447,806, on March 11th, 2016, being conducted according to the ethical standards required to meet the prerogatives of Resolution 466/2012 of the National Health Council.

RESULTS

A total of 1,269 ATMB reports were performed in the period from 2013 to 2017, with a predominance of female professionals, 79.43% (n=1,008), the age group from 17 to 26 years old

with 36.32% (n=461) and high school education in 42.32% (n=537) of the cases.

Regarding the professional category with the most cases of ATMB, is emphasized nursing technicians with 42.00% (n=533), followed by

students from varied areas, 12.29% (n=156).

Regarding professional experience, 81.95% (n=1,040) of the cases had time less than or equal to 5 years, as Table 1 below shows.

Table 1. Characterization of the profile of reports according to data collected in SINAN report sheets, 2013-2017. Cascavel, PR (2018)

Gender	N	%
Female	1,008	79.43%
Male	261	20.57%
Total	1,269	100%
Age		
17 – 26	461	36.32%
27 – 36	442	34.83%
37 – 46	266	20.96%
47 – 56	89	7.01%
> 57	11	0.86%
Total	1,269	100%
Education		
Complete High School	537	42.32%
Complete HigherSchool	301	23.72%
Incomplete HigherSchool	226	17.81%
Ignored	72	5.67%
Complete Primary School	41	3.23%
Incomplete High School	38	2.99%
Incomplete 5 th to 8 th grade Primary School	19	1.50%
Incomplete 1st to 4 th grade Primary School	12	0.95%
Notfilled	11	0.87%
Complete 4 th grade of Primary School	6	0.47%
Not applicable	6	0.47%
Total	1,269	100%
Nurse Technician	533	42.00%
Student	156	12.29%
Nurse	90	7.09%
Clinical Analysis Laboratory Assistant	90	7.09%
Dentist Surgeon - General Practitioner	40	3.15%
Nursing assistant	38	2.99%
General practitioner	35	2.75%
Pharmacist	11	0.87%
Oral Hygiene Technician	11	0.87%
Other Health Professions	59	4.67%
Other Professions	206	16.23%
Total	1,269	100%
≤ 5	1,040	81.95%
6 - 11	140	11.03%
12 – 16	53	4.17%
17 – 21	18	1.41%
> 21	18	1.41%
Total	1,269	100%

Source: SINAN (2013-2017).

Regarding the number of accidents related to the type of exposure, it was observed that the percutaneous accident was prevalent in most of the activities performed by the accident, totaling 74.15% (n=941) of the accidents, standing out 8.51 % (n=108) cases of improper disposal of perforating material on bench, bed, floor, among others.

It was evidenced that 8.11% (n=103) of the cases were characterized in other types of

circumstances, among which: during aspiration of upper airways; emptying urine collection bag; emesis; among others.

When the chi-square test was applied, it was found that there is a significant difference between the type of exposure X circumstance of the accident, indicating, therefore, that the exposure of the accident depends on the circumstance it occurs (p-value <0.00) (Figure 1).

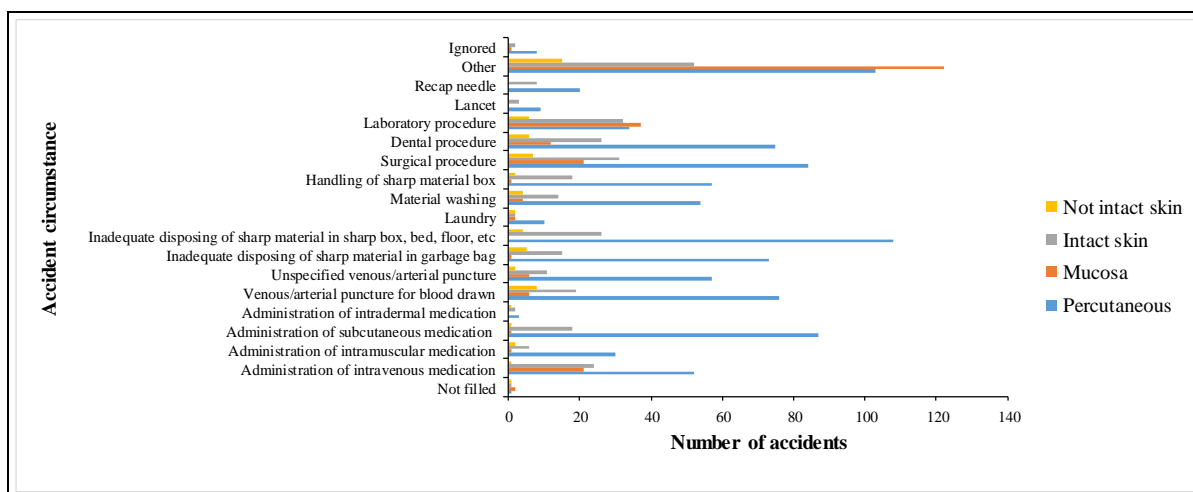


Figure 1. Exposure type X circumstance of the accident according to data collected in the SINAN report sheets, 2013-2017. Cascavel, PR, 2018.

Source: SINAN (2013-2017).

Regarding the time performing the work related to the type of exposure, it was observed that the percutaneous accident was prevalent during the performance of the activities performed by the worker, being higher among the workers in the function for time equal to or less than 5 years in the current occupation, represented by 60.91% (n=773) cases.

When Pearson's correlation was applied between the evaluated variables, it was negative in all cases, and therefore significant (p-value=0.20), that is, it can be said that with the increase in time performing the work of health professionals, less accidents with biological material occur (Figure 2).

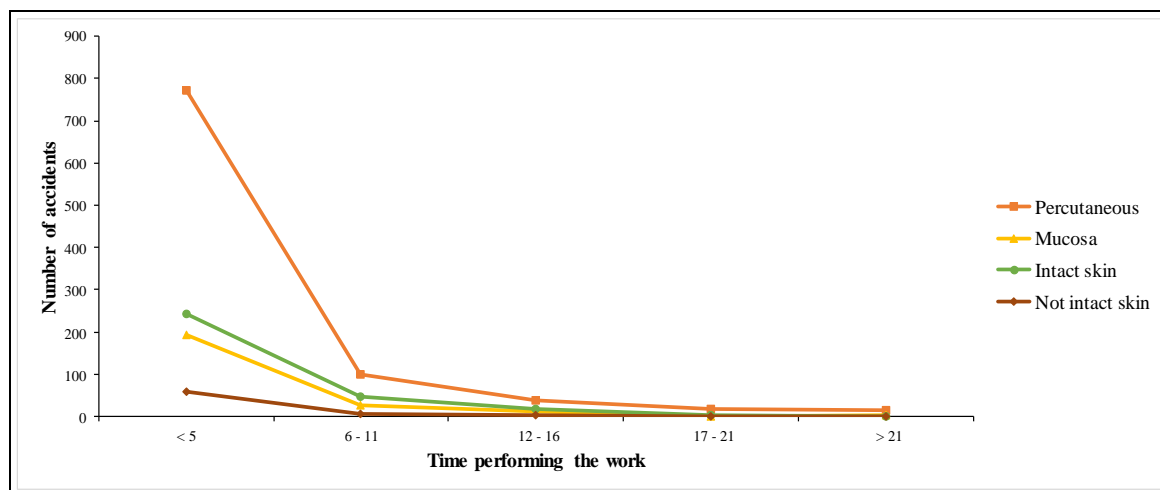


Figure 2. Type of exposure X time performing the work according to data collected in SINAN report sheets, 2013-2017. Cascavel, PR, 2018.

Source: SINAN (2013-2017).

Regarding the type of exposure X agent of the accident, the prevalence was the needle with lumen concomitantly with the percutaneous route of exposure in 49.88% (n=633) of the accident cases.

When the chi-square test was applied, it was observed that there is a significant difference between the exposure type X agent (p-value <0.00) (Figure 3).

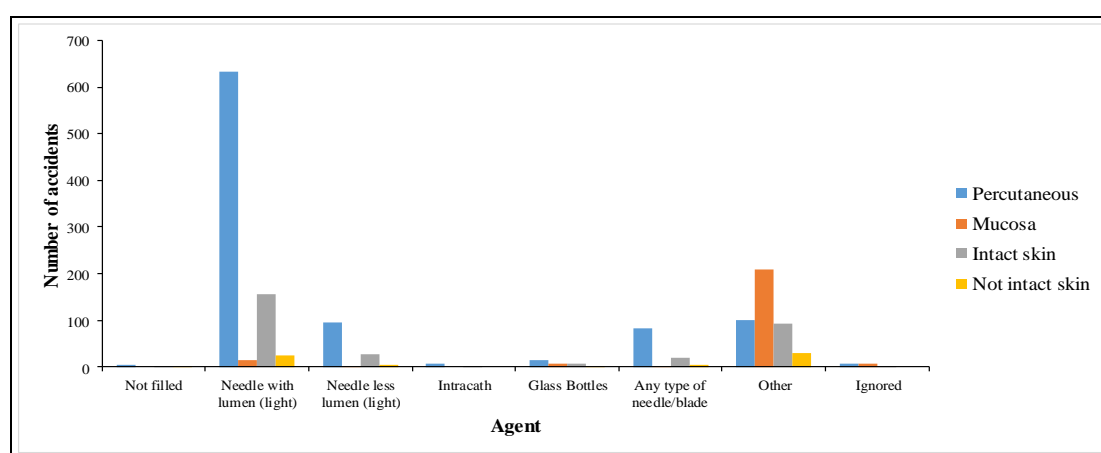


Figure 3. Type of exposure X agent according to data collected in the SINAN report sheets, 2013-2017. Cascavel, PR, 2018.

Source: SINAN (2013-2017).

Regarding the use of PPE during activities involving fluids and secretions performed by professionals, it was found that at the time of

exposure many of the workers did not carry these protection resources, emphasizing underutilization, as shown in Table 2 below.

Table 2. Use or not of PPE at the time of exposure according to data collected in SINAN report sheets, 2013-2017. Cascavel, PR (2018)

PPEs	YES	%	NO	%
Boot	320	25.22%	949	74.78%
Facial Protection	158	12.45%	1,111	87.55%
Mask	486	38.30%	783	61.70%
Coat	768	60.52%	501	39.48%
Gloves	1,074	84.63%	195	15.37%
Protective goggles	340	26.79%	929	73.21%

Source: SINAN (2013-2017)

Regarding the outcome, of the total of 1,269 cases, 70.13% (n=890) of the accidents had the known source and of these, 7.24% (n=92) had follow-up and discharge without serological seroconversion, 0.07(n=1) had serological seroconversion, 20.01% (n=254) were negative source patients, 23.40% (n=297) abandoned the follow-up, 7.24% (n=92) of the cases were ignored, and data was not filled in 12.13% (n=154) report sheets.

Of the remaining accidents, 29.87% (n=379) did not have a known source, 6.61% (n=84) records were not filled at the time of notification, 0.23% (n=3) had seroconversion, 7.09% (n=90) had follow-up and discharge without seroconversion, 1.10% (n=14) were post-exams negative source patients, 12.13% (n=154) abandoned follow-up and 2.67% (n=34) of the cases were ignored.

DISCUSSION

As limitations of this research, we emphasize incomplete filling of the report forms and underreporting of information or the wrong filling of data, evidenced by the current ATMB notification form configuration, with ambiguous items difficult to understand by the professional when filling it.

It is reiterated that this research can contribute through the scientific knowledge presented and that is a source for new research in the area of health worker, besides that it can subsidize the managers of health institutions in order to permeate more and more the multiplication of knowledge and the importance of using PPEs when performing procedures of any nature.

Thus, based on the data identified, it was found that the female gender represented an expressive percentage of exposed due to the historical characteristics of the nursing team,

which in its large part is carried out by women, justifying its higher prevalence and corroborating with other studies found in the literature⁽⁶⁾, in addition to the historical and cultural context of female participation in care-related professions^(14,15).

The age group of professionals who suffered from ATMB was predominant among the young adult age group, and a similar study was found, in which the largest number of exposures occurred in professionals aged 20 to 30 years⁽⁶⁾.

The young age group can be justified by the fact that workers over 40 years of age perform more administrative tasks and to a lesser extent care activity, which are associated with the risk for occupational exposures. On the other hand, this fact reveals concern about this age group that, in such a short time, has already been exposed to accidents with biological materials⁽⁶⁾.

High school level professionals were the most vulnerable to exposure to biological material and affected by ATMB, considering the longer time spent in health services and the large number of procedures performed⁽¹⁾.

Confirming the results related to schooling, a study conducted in the state of São Paulo, with 636 nursing professionals, indicated that 57.70% of the participants had completed high school⁽³⁾.

These data show that health activities in Brazil are predominantly performed by professionals with high school education, and can be justified by low educational level and economic factors, since the hiring of technicians is cheaper for health institutions⁽¹⁶⁾.

Regarding the time of professional experience at the moment of the ATMB, a short time period of performance in the exercise of the function was verified, predisposing to the occurrence of greater accidents in those first years of work.

Thus, with labor intensification, the professional training of health workers, long working hours, night shifts and weekends increase the risk of accidents, specifically with handling of needles⁽¹⁷⁾.

Regarding the types of exposures, the percutaneous route was the most frequent in accidents. Similar data were found in a study carried out in Poland, with a predominance of sharps injuries in 92.50% of the cases, the percutaneous route being the most notorious⁽¹⁸⁾.

Accidents can occur in several situations during patient care, but the venous puncture procedure was the most evidenced. A similar result was found in a hospital in the interior of the state of São Paulo, when 29.10% of the exposures occurred performing this task⁽⁵⁾.

Regarding the accident circumstance, the inappropriate disposal of sharps was the most evidenced, emphasizing that these residues need to be discarded immediately after use, in rigid containers, resistant to puncture, rupture and leaks, with a lid, respecting the recommended full limit⁽¹⁾.

Thus, direct and continuous patient care work performed by nursing professionals makes them susceptible to contamination by biological material, especially in percutaneous needle-inoculation accidents, which are the main responsible for the occupational transmission of Primary Bloodstream Infections (PBC)⁽¹⁷⁾.

It should be noted that lumen needles are great cause of accidents involving biological materials, so health institutions should make them available with safety devices and enable workers to use and dispose of them correctly according to NR No. 32⁽⁷⁾.

Therefore, a point to be highlighted in this research is the low use of PPE at the moment of the accident, since this reinforces the importance of using them, routinely and correctly as preventive measures^(18,19).

Regarding the serological situation, in many accidents, the source patient was identified, corroborating with another study carried out in 2014⁽¹⁾, reaffirming the importance of post-exposure monitoring of biological material and, if necessary, the use of prophylactic scheme. Other measures should be taken by workers to avoid pathogen infections, such as keeping the vaccination schedule up to date⁽²⁰⁾.

Finally, ATMBs could for the most part be avoided if health professionals adhere to good prevention practices, standard operating norms and procedures and assistance in the performance of their daily activities.

CONCLUSIONS

It can be concluded from the data obtained in this research that the type of exposure is directly related to the accident, time performing the work

and the causer agent of the accident, predominantly female, in young adults with high school level, working mainly in the nursing area, with professional experience equal to or less than 5 years.

Regarding the use of PPE, it was evidenced that these were little utilized by professionals, in the research presented here.

These findings may support the restructuring of the ATMB report sheet, given that, in the

current configuration, it presents ambiguous and difficult to understand items by the professional when filling it out.

Thus, a suggestion presented by researchers for further studies involving worker health is the reformulation of the work accident report sheet with exposure to biological material, in order to configure this in a clearer and more objective when filling it out.

CARACTERIZAÇÃO DOS ACIDENTES COM MATERIAL BIOLÓGICO ENTRE PROFISSIONAIS DE SAÚDE DE 2013 A 2017

RESUMO

Objetivos: caracterizar os acidentes de trabalho com material biológico de acordo com o tipo de exposição e descrever o perfil dos profissionais dos serviços de saúde que sofreram esses acidentes. **Método:** estudo epidemiológico, transversal e retrospectivo. Fizeram parte da pesquisa 1.269 notificações de acidentes de trabalho com material biológico, os quais foram coletados através do Sistema de Informação de Agravos de Notificação (SINAN) e analisados por meio de estatística descritiva e inferencial. Para a análise de associação entre as variáveis selecionadas, utilizou-se o teste *qui* quadrado e a Correlação de Pearson. **Resultados:** identificou-se que o tipo de exposição tem relação direta com a circunstância do acidente, com o tempo de trabalho e com o agente causador do acidente, com predominância do sexo feminino, em adultos jovens, com escolaridade em nível médio, atuando principalmente na área da enfermagem, com experiência profissional igual ou inferior a 5 anos. **Conclusão:** ressalta-se a importância das boas práticas, como o uso de equipamentos de proteção individual, esquema vacinal, e o acompanhamento do profissional pós-exposição a acidentes de trabalho com material biológico, com intuito primordial de promover a saúde do trabalhador e a gestão de riscos nas instituições.

Palavras-chave: Enfermagem do Trabalho. Gestão de Riscos. Serviços de Saúde do Trabalhador. Contenção de Riscos Biológicos.

CARACTERIZACIÓN DE LOS ACCIDENTES CON MATERIAL BIOLÓGICO ENTRE PROFESIONALES DE SALUD DE 2013 A 2017

RESUMEN

Objetivos: caracterizar los accidentes laborales con material biológico de acuerdo con el tipo de exposición y describir el perfil de los profesionales de los servicios de salud que sufrieron estos accidentes. **Método:** estudio epidemiológico, transversal y retrospectivo. Hicieron parte de la investigación 1.269 notificaciones de accidentes de trabajo con material biológico, que fueron recolectadas a través del Sistema de Información de Agravios de Notificación (SINAN) y analizadas por medio de estadística descriptiva e inferencial. Para el análisis de asociación entre las variables seleccionadas, se utilizó la prueba *chi-cuadrado* y la Correlación de Pearson. **Resultados:** se identificó que el tipo de exposición tiene relación directa con la circunstancia del accidente, con el tiempo de trabajo y con el factor causante del accidente, con predominancia del sexo femenino, en adultos jóvenes, con escolaridad secundaria, actuando principalmente en el área de la enfermería, con experiencia profesional igual o inferior a 5 años. **Conclusión:** se señala la importancia de las buenas prácticas, como el uso de equipos de protección individual y cobertura de vacunación, y el acompañamiento del profesional post exposición a accidentes laborales con material biológico, con objetivo primordial de promover la salud del trabajador y la gestión de riesgos en las instituciones.

Palabras clave: Enfermería del Trabajo. Gestión de Riesgos. Servicios de Salud del Trabajador. Contención de Riesgos Biológicos.

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