

Needlestick and Sharp Instruments Injuries among Brazilian Dentistry Students

Abstract

Background: The occurrence of occupational accidents is common among students and dentists. The present study is aimed to evaluate the prevalence and characteristics of needlestick and sharp instrument injuries among dentistry students. **Materials and Methods:** A documentary research was carried out with data being obtained from the analysis of 137 medical records of injuries caused by needlestick and sharp instruments occurring in the period from 2012 to 2016 and were analyzed regarding the characteristics of the victim (gender and age) and the accident (year, time, environment, and time interval between exposure and search for care). Data were organized in the Statistical Package for Social Sciences software version 18 and were presented through descriptive statistics. **Results:** The occurrence of accidents was high (43.1%), with the predominance of female victims (66.1%) and aged up to 23 years (55.9%). The majority of events occurred in the afternoon (54.4%), in the clinical setting (70.7%), and in 75% of the cases, the search for care occurred within 2 h after exposure. **Conclusion:** Accidents with needlestick and sharp instruments have high frequency and involve mainly female students. They are more common in the afternoon and in the clinical setting and the time interval was between exposure and the search for care complied with recommendations of the Brazilian legislation.

Keywords: Accidents, dentistry, exposure to biological agents, occupational, occupational risks

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Introduction

Work-related accidents with exposure to biological material among health professionals are a cause for concern in view of the harm they may cause to institutions and workers.^[1] Although the risk of occupational contamination by infectious agents has been known since 1940,^[2] the adoption of preventive measures against this contamination only gained strength after 1980, due to the discovery of the existence of the HIV virus and the acquired immune deficiency syndrome epidemic.^[2-4]

The restricted working space of the oral cavity, the possibility of unexpected movement of the patient, the routine use of sharp instruments, added to the direct manipulation of blood, saliva and secretions make the clinical dental care an unhealthy moment and propitious to the occurrence of percutaneous injuries,^[5-8] facilitating the transmission of pathogens by cross-infection^[6] such as hepatitis^[2,9] and HIV viruses.^[8]

A study carried out in Taiwan revealed that 23% of dentists reported more than one injury with sharp instruments per week,

mainly during clinical procedures (31%) or with needles (28%).^[10] In Brazil, the prevalence of accidents with needlestick and sharp instruments among dentistry students is 25.3%.^[11]

Thus, this high prevalence, together with the fact that 52.4% of dentists do not know the existence of occupational postexposure protocols,^[2] highlights the need to educate these professionals about the risks to which they are exposed, making occupational accidents less frequent.^[6,12]

Therefore, knowing the profile of work-related accidents with biological material can be the starting point for the elaboration and planning of measures to improve working conditions.^[13] In view of the above, the aim of this study was to describe the epidemiological profile of dentistry students of a public university, victims of accidents with needlestick and sharp instruments.

Materials and Methods

This is a documentary research with a transversal and descriptive character and quantitative approach.

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Data were collected at the University Center for Health Biosafety (UCHB), Department of Dentistry, State University of Paraíba. UCHB is a referral service for victims of accidents with sharp instruments, providing rapid testing, psychological support, and referral for prophylactic treatment, if necessary.

A total of 137 medical records from January 2012 to November 2016 were analyzed, and information on the year of the accident, sex and age of the victim, time and place of occurrence (clinic, laboratory, or purge), and the time interval between accident and search for care were collected.

As inclusion criterion, the victim of accident should be undergraduate dentistry students and should have suffered an accident with sharp instruments during activities developed in the course. Protocols of dentistry students who sought service for other types of accidents were excluded as were those involving students from other health-care courses, teachers, and other professionals.

Data were tabulated and descriptively analyzed (absolute and percentage frequencies) using the SPSS® - Statistical Package for the Social Sciences - version 18.0, IBM Corp., Armonk, New York, USA.

This study followed recommendations of resolution 466/12 of the National Health Council^[14] that regulates research with human beings in Brazil and was approved by the University of Paraíba Ethics Research Committee under protocol No. 54320116.7.0000.5187.

Results

The occurrence of injuries with needlestick and sharp instruments involving students was 43.1% ($n = 59$), with half in 2016 (50.9%). The age of victims was ranged from 19 to 37 years, with a median of 23 years. There was a predominance of women (66.1%) and accidents were occurred mostly in the afternoon (54.4%) and in the internal environment of dental clinics (70.7%) [Table 1].

For 75% of the victims, the time interval between the accident and the search for specialized care was up to 2 h [Table 2].

Discussion

In the presence of some blood pathogens, injuries with sharp instruments can cause life-threatening infections and are therefore an important issue regarding the occupational safety of health-care workers.^[10]

Dentists are a part of a group at high risk of exposure to this type of accident,^[6,7] which is even more pronounced among dentistry students due to their few work experiences.^[9,15] Even using basic precautions, dentists can be exposed to pathogens in the course of their work activities.^[16] To avoid transmission of cross-infection, some safety precautions

Table 1: Distribution of accidents with needlestick and sharp instruments according to year, sex, age, shift, and location of the accident. Campina Grande, Paraíba, 2016

Variables	n (%)
Year (55)	
2012	1 (1.8)
2013	3 (5.5)
2014	15 (27.3)
2015	8 (14.5)
2016	28 (50.9)
Sex (59)	
Female	39 (66.1)
Male	20 (33.9)
Age (59)	
≤23 years	33 (55.9)
≥24 years	26 (44.1)
Time the accident occurred (57)	
Morning	21 (36.8)
Afternoon	31 (54.4)
Night	5 (8.8)
Accident environment (58)	
Clinics	41 (70.7)
Purge [†]	17 (29.3)
Total	58 (100.0)

[†]Sector in which the student washes and prepares instruments for sterilization

Table 2: Distribution of accidents according to the time interval for the search for care

Time interval (h)	n (%)
Until 2	39 (75.0)
Until 24	7 (13.5)
Until 48	2 (3.8)
Above 72 h	4 (7.7)
Total	52 (100.0)

should be taken, in addition to the vaccination and adequate compliance with postexposure protocols.^[8,12]

Dentists need caution both in patient management and in the handling of work instruments,^[10] especially in dealing with sharp instruments since injuries with needles and sharp instruments represent the highest occupational risk for contamination by pathogens transmissible by blood.^[10]

Although the underreporting of accidents with biological risk is a universal phenomenon among health professionals,^[6] this study showed an increase in the number of reports, with peak observed in the year 2016 (50.9%). This fact can be explained by the adoption of a policy of awareness of risks during dental care and by educational and preventive actions developed by the specialized assistance service. Therefore, this evolution in accident report may reflect a greater perception of future professionals regarding the need for basic and immediate care required after exposure, leading them to search for the service.^[2]

The dentistry literature shows that the occurrence of accidents with needlestick and sharp instruments increases with advancing age.^[5] Older (experienced) dentists are more easily injured, either due to the greater overload of activities or to the oversight with infection control procedures.^[10] In this study, younger students were the most affected.

Educational institutions play a key role in student attitudes about the adoption of correct habits for the control of cross infection.^[4,15] Therefore, there is a great need for more incisive biosafety awareness by students to acquire the perception of risk and build the capacity of protection, making them understand the need for care and caution in performing dental procedures,^[9] shaping them into safe clinical day-to-day behavior.

A predominance of females (66.1%) among victims was observed, corroborating previous findings.^[3] However, there may have been underreporting of accidents by male students since as women are more cautious about their health and tend to have greater preventive self-care,^[12,17] they are possibly more attentive to the need to follow postexposure protocols and therefore cause a greater demand for the service.

Most of the accidents were reported to occur in the afternoon (54.4%). When analyzing the curricular structure of the dentistry course, it was found that the afternoon period concentrates the greatest number of clinical disciplines, especially those whose procedures are more invasive, such as the practical activities of surgery. In addition, since the activities of the dentistry course are developed in two shifts, fatigue may have been an aggravating factor for the occurrence of accidents.

The analysis of the environment in which accidents with needlestick and sharp instruments occurred showed that most (70.7%) were recorded in dental clinics. The risk for the occurrence of accidents during dental practice changes according to the work process, the specific care characteristics, the infrastructure, and the available resources.^[18] It is assumed that little practical experience and reduced clinical skills of students,^[6,15] added to the psycho-emotional factors, nervousness, anxiety, and pressure for being constantly evaluated, may have influenced the high number of case in this population. In addition, most curricula in dentistry schools involve clinical activities increasing the likelihood of accidents in this environment.^[15]

A relevant finding of the present study was the high number of accidents recorded in the purge environment, a place where students perform the cleaning of instruments (29.3%). It is assumed that the rush to complete this activity due to the high student demand associated with inattention or negligence in the use of appropriate personal protective equipment is responsible for the occurrence of

accidents. Therefore, this activity should be supervised by professionals, raising awareness, and training students.

To achieve maximum efficacy, postexposure chemoprophylactic interventions need to be initiated as soon as possible after the accident, preferably within 2 h.^[19] When analyzing the time elapsed between the time of the accident and the demand for assistance, it was found that in most cases, the time ideally recommended was respected. Nevertheless, the prevalence of individuals who delayed seeking postexposure care was still high. This condition is worrying since the results of preventive protocols become poorly effective as the time elapsed for its initiation extends.^[19]

Neglecting safety procedures by dentistry professionals and students are still common since over time they tend to forget and ignore protocols.^[9] Dental professionals are unaware of the procedure that must be followed in the occurrence of a biohazard accident.^[5] Studies with dentistry students in Brazil have shown that a low number of students who reported of having suffered accidents with sharp instruments sought guidance from teachers or the accident department of the institution.^[11] Thus, it was observed that the understanding of dentistry professionals about accidents with biological risk and their preventive measures is inadequate.^[4,7]

The knowledge about the pathogenesis of microorganisms, personal experience with accidents in the workplace, and the level of knowledge about their prevention can lead to changes in attitudes and practices, with greater precaution and less risk, thus influencing the reduction of these events.^[15,16] Some authors suggest that knowledge is an important tool to favor adherence to protocols.^[2]

Accidents with needlestick and sharp instruments can be avoided by cautious manipulation of these instruments, protection of drills and needles, and proper disposal of needles, which should not be bent, broken, or handled without the use of gloves.^[2] When they occur, accidents should be treated as a medical emergency, and prophylactic interventions should be initiated within 2 h from the occurrence to obtain greater preventive success.^[19]

Prevention is the main and most effective measure to avoid the occupational transmission of diseases in dental practice.^[2] Considering that the preventive practices of dentistry students need to be improved.^[9] Periodic training and the presence of a permanent educational project with emphasis on prevention, awareness, and follow-up of occupational accident cases should be a part of the routine of dentistry schools.^[6,10]

In addition, focusing on means to instigate positive preventive practices among dentistry students should be considered as one of the main goals to be achieved by educational institutions,^[9] which is a subject that needs to be approached with priority.^[10,11]

Conclusion

Accidents with needlestick and sharp instruments had a high frequency and occurred mainly with female students and in the afternoon in the clinical setting, and the time interval between exposure and the search for care complied with Brazilian recommendations.

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Conflicts of interest

There are no conflicts of interest.

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