



## Intimate partner violence against women, circumstances of aggressions and oral-maxillofacial traumas: A medical-legal and forensic approach

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### ABSTRACT

**Introduction:** Intimate partner violence (IPV) is a serious public health problem that frequently results in oral-maxillofacial traumas, generating high social and economic costs. The aim of this study was to describe the profile of women victims of IPV and determine the pattern of oral-maxillofacial traumas, according to a medical-legal and forensic perspective. An exploratory study of 1361 suspected cases of women victims of IPV was carried out based on database of an Institute of Legal Medicine and Forensic Dentistry of Northeastern Brazil during a period of 4 years. Medico-legal and social records of victims were searched for information related to sociodemographic data, circumstances of aggressions and trauma patterns. Descriptive and multivariate statistics and Multiple Correspondence Analysis (MCA) were performed.

**Main results:** Almost half of victims exhibited some oral-maxillofacial trauma resulting from IPV (45.8%). Lesions affecting more than one third of the face (41.3%), especially in soft tissues (96.1%) were the most common. Based on the MCA results, two distinct victimization profiles (P1 and P2) have been identified. P1 was mainly characterized by women aged less than 28 years, living in the urban area, with higher education and working. They were assaulted using physical force in community settings perpetrated by former partner or ex-boyfriend during the night and weekends, resulting in oral-maxillofacial traumas. P2 was mainly composed of women aged over 28 years, living in the suburban or rural areas, with low schooling and who did not work. They were assaulted by firearm or weapon in their own home, perpetrated by their partner or boyfriend during the day and weekdays, resulting in trauma to other body parts.

**Conclusions:** Oral and maxillofacial traumas are very common among women victims of IPV who searched for medical-legal service. In this context, forensic dentists can play a key role during the diagnostic process and should always work together with medical, biochemical and toxicological experts. The findings of this study may contribute to the formulation of evidence-based policies.

## 1. Introduction

### 1.1. Background

Intimate partner violence (IPV) is a serious public health problem whose magnitude and risk factors vary according to different social, economic and cultural scenarios [1–5]. It can be defined as a pattern of coercive behavior perpetrated by current or former spouse, law partner, sexual partner or dating partner, which causes physical, sexual or psychological harm, including acts of physical aggression, sexual coercion, psychological abuse and control behaviors [6].

International statistics has revealed that between 13% and 61% of women aged 15–49 years reported that an intimate partner has

physically abused them at least once in their lifetime [6]. In Brazil - a country known for its violence culture - IPV against women is one of the main forms of violation of their human rights. Although it is a recognized problem in the lives of millions of female Brazilians, studies pointing to the magnitude of this phenomenon in the health of the population are scarce [3,7–9].

Exposure to IPV may have negative consequences for health, well-being and quality of life [10]. Abused women are more likely to have emotional, psychological and physical problems, including traumatic injuries, impact on oral health, and limitations in social functioning [11–15]. In Brazil, IPV is responsible for high morbidity and mortality rates and generates great losses to women's health, with consequent repercussions on their work capacity and family and social relationships

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[8,9].

Previously published studies have reported that exposure to IPV is often related to the occurrence of oral and maxillofacial traumas, and this pattern of injury may represent an initial marker of this violence mode [10,16]. Oral and maxillofacial trauma may result in permanent functional consequences, such as chewing difficulties, pain sensation or changes in soft tissue mobility and affect aspects of social life and quality of life of women physically abused by intimate partners [11].

Face is one of the most singular regions of the human body, as it houses anatomical structures important for swallowing, chewing, speech, breathing and communication, contributing to the self-image and self-esteem of an individual, being synonymous of attractiveness and beauty, especially for women [10,17,18] and not only a component of organic elements. It is inserted in the everyday life, in interpersonal relationships, and can influence the degree of proximity or distance from the set of attributes that characterize the individual's image [19].

### 1.2. Importance

After conducting an exhaustive critical literature review, it has been found that studies that have examined physical injuries associated with IPV against women attended in emergency hospitals are numerous [20,21]. However, studies detailing the pattern of lesions of women suspected of IPV victims attended in medical-legal and forensic services are scarce [5,11]. Information obtained from medical and legal reports of IPV episodes against women can substantially contribute to the decision-making process, creation of prevention strategies and better knowledge about the forms of interaction between health sciences and law.

### 1.3. Goals of this investigation

In this sense, the aim of this study was to describe the profile of women victims of IPV and determine the pattern of oral-maxillofacial traumas, according to a medical-legal and forensic perspective.

## 2. Materials and methods

### 2.1. Study design and setting

A cross-sectional study was carried out involving the analysis of medical-legal and social records of women victims of IPV attended at an Institute of Legal Medicine and Forensic Dentistry in a metropolitan region of Northeastern Brazil during four years (between January 2008 and December 2011). This institution is a reference center for 23 surrounding cities and provides care to IPV victims residing in urban, suburban and rural areas, covering a population of > 6,80,000 inhabitants. The region studied shows significant social, economic and cultural inequalities and high rates of injuries resulting from interpersonal violence and land transportation accidents.

National legislation provides that victims of violence, when reporting abuse to the police, must be sent to conduct a criminal investigation at Centers of Legal Medicine and Forensic Dentistry [22]. These examinations are carried out by two specialists in Forensic Medicine and Dentistry and serve as a legal instrument that assists judges during the process of conviction or acquittal of the aggressor. After conducted a retrospective analysis through the Forensic Institute's database, 1361 medical-legal and social records were related to women aged 18 years or older supposedly victims of IPV. Sample size calculation was also performed to ensure that the number of cases assessed was sufficient to extract accurate information, using Epi Info software (version 7.2, Centers for Disease Control and Prevention – CDC).

The sample size calculation was carried out considering the study design. To determine the prevalence of maxillofacial trauma resulting from IPV against women, it was necessary to calculate the sample size appropriate to this study design (the sample size calculation to estimate

prevalence). The sample size was estimated based on a 50% prevalence rate (since it was unknown), a 3% acceptable margin of error, and 95% confidence interval (CI). The minimum sample size was estimated at 1066 cases. To compensate for losses during the evaluation of the victims' records (incomplete data), all 1361 cases were evaluated, characterizing a census of morbidity cases.

Before conducting the final research, a pilot study was conducted to develop a method of interpreting the information available in the medical-legal and social records of victims. In the pilot study, three researchers were submitted to training and calibration exercise to perform data collection. The exercise was conducted with 30 different reports and randomly selected from the year 2007 on two occasions, with an interval of 1 week. Due to the fact that the institution does not yet have a digital information system, each record has been read and information has been transcribed into the form. Intra-examiner and inter-examiner concordances were evaluated using the Kappa test and both obtained  $K = 0.85–0.95$ , considered very good.

### 2.2. Methods of measurement

The research investigated the sociodemographic data of victims, the circumstances of aggressions and the characteristics of traumas. A form was structured specifically for this study from information contained in the medical-legal and social records: (i) *sociodemographic data*: victim's age dichotomized by the median to obtain more homogeneous groups ( $\leq 28$  years/  $> 28$  years); victim's place of residence (urban zone/suburban zone/rural zone); victim's marital status (single, widowed or separated/married or stable union), victim's schooling categorized into lower and higher ( $\leq 8$  years of study/  $> 8$  years of study), victim's employment status (unemployed/worker); (ii) *aggression circumstances*: level of conflict involvement (victim's residence/community settings); aggression mechanism (physical force/firearm or weapons, such as knives, scythes and axes); offender's sex (female/male); relationship between offender and victim (partner/ex-partner); time of occurrence (daytime/nighttime); day of occurrence (weekdays/weekend days); (iii) *characteristics of trauma*: oral-maxillofacial trauma (present/absent); region of face affected (upper third/middle third/lower third/more than one region); type of maxillofacial trauma (nasal fracture/mandible fracture/maxillary fracture/zygomatic complex fracture/orbital blow-out fracture/alveolar ridge fracture/fracture of more than one facial bone/facial laceration); region of body affected (head/neck/upper limbs/lower limbs/thorax/abdomen/more than one region).

### 2.3. Data analysis

Data were analyzed using IBM SPSS Statistics version 20.0 (IBM Corp., Armonk, NY, USA). Initially, descriptive statistical analysis was performed aiming to characterize the sample. Absolute and relative frequencies of all variables were calculated. Then, to assess associations between categories of variables investigated, MCA was performed. This is a multivariate statistical technique of interdependence with exploratory character, indicated for situations in which researchers wish to analyze categorical data with a large number of variables and position response categories in the same system of axes or dimensions [23,24].

The starting point was the structuring of a data matrix in which cases of women victims of IPV are in lines and the variables of interest in columns (sociodemographic characteristics of victims, aggression circumstances and characteristics of traumas). By crossing lines and columns, a defined "profile" is obtained from the data set [23]. It is possible to graphically represent the most important relationships between categories of variables and to highlight groups of individuals with specific profiles to explain oral-maxillofacial trauma.

Discrimination measures (DM) indicate the variables most relevant for the formation of each axis/dimension and the coordinates of centroids (CC) help the reader to locate each category on the perceptual

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