



## Original Article

# Evaluation of suspected physical abuse in children: a 500-case study<sup>☆</sup>



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## ARTICLE INFO

## Article history:

Received 4 June 2016

Accepted 25 July 2016

Available online 11 May 2017

## Keywords:

Wounds and injuries

Child abuse

Fractures, bone

Orthopedics

## ABSTRACT

**Objective:** This study evaluated the epidemiological profile of patients with suspected physical abuse, especially regarding the occurrence of fractures, treated in a referral hospital.

**Methods:** The authors reviewed all reports of suspected abuse against children and adolescents (AACA) in this hospital from January 2005 to December 2015. They were assessed and separated by month and year. The characteristics of the victims of physical abuse with occurrence of fractures were studied. The features of the fractures were evaluated in those patients with available radiographs.

**Results:** Of the 3125 notifications, 500 were classified as physical injuries; of these, 63 had fractures. An annual progressive increase in notifications was observed. As for age group, 50 patients (80.6%) were up to three years old and 36 (58%) up to one year. Most were male (60%) and the likely aggressors were mother alone and both parents (27.5% each). In 30 patients with available images, fractures of long bones (femur, tibia, and humerus) predominated (71%), as well as a single fracture line (74%), diaphyseal location (73%), and a transverse line (57%). There were two deaths in fracture cases (3%).

**Conclusion:** All orthopedists should be alert to suspected AACA in children with trauma below the age of three, even without classic signs of abuse.

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## Avaliação de crianças com suspeita de maus-tratos físicos: um estudo de 500 casos

## RESUMO

**Objetivo:** Este estudo tem objetivo de avaliar o perfil epidemiológico de pacientes atendidos em hospital de referência com suspeita de maus-tratos físicos, em especial quanto à ocorrência de fraturas.

**Métodos:** Todas as notificações de suspeita de maus-tratos contra crianças e adolescentes (MTCAA) feitas entre janeiro de 2005 e dezembro de 2015 foram avaliadas e separadas por

## Palavras-chave:

Ferimentos e lesões

Maus-tratos infantis

Fraturas osséas

Ortopedia

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<http://dx.doi.org/10.1016/j.rboe.2017.05.004>

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mês e ano. Dentre as vítimas de maus-tratos físicos, várias características dos pacientes que apresentavam fraturas foram avaliadas. Quando as radiografias estavam disponíveis, analisaram-se as características das fraturas.

**Resultados:** De 3.125 notificações, 500 foram classificadas como lesões físicas e dentre essas 63 apresentavam fraturas. Observou-se um aumento progressivo anual das notificações. Quanto à idade, 50 pacientes (80,6%) tinham até 3 anos e 36 (58%) até 1 ano. A maioria era do gênero masculino (60%) e o provável agressor era a mãe isoladamente e ambos os pais (27,5% cada). Em 30 pacientes com imagens disponíveis, predominaram as fraturas de ossos longos (fêmur, tibia e úmero, 71%), únicas (74%), diafisárias (73%) e transversas (57%). Ocorreram dois de óbitos nos casos de fraturas (3%).

**Conclusão:** Todos os ortopedistas devem estar alertas para suspeita de MTCAA em crianças com traumas abaixo de 3 anos, mesmo sem sinais clássicos de maus-tratos.

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## Introduction

Despite Tardieu's pioneering study in 1860, it was only in the second half of the last century that violence against children and adolescents began to be studied more consistently.<sup>1-3</sup> Nowadays, abuse against children and adolescents (AACA) is recognized as a complex public health problem, with high financial, social, and emotional costs to society.<sup>4</sup> In Brazil, although covered in previous legislation, notification by the healthcare professional of suspected or confirmed cases of AACA only became compulsory in 1990, with the implementation of the Statute of the Child and Adolescent (Estatuto da Criança e do Adolescente [ECA]), through the Federal Law No. 8069.<sup>3</sup> Even with the obligation to notify, the increased interest in the subject, and the data showing that Brazil has high levels of violence, there are few concrete statistics of the incidence of AACA in Brazil. This is due to the difficulties in definition, recognition, and reporting by healthcare professionals.<sup>5</sup>

Because fractures are one of the most common forms of abuse presentation, the orthopedist is often the first physician to evaluate these children.<sup>4</sup> Nevertheless, few studies on these fractures and on the role of the orthopedic surgeon have been published in the national orthopedic literature; they consist of case reports<sup>5,6</sup> or trauma series in which suspected cases of AACA were identified.<sup>7,8</sup> Only one publication that specifically addressed the occurrence of fractures in patients victims of abuse was retrieved, in a non-indexed journal.<sup>9</sup>

This study aimed to evaluate the epidemiological profile of children who were suspected victims of AACA, specifically physical abuse with occurrence of fractures, attended to at a pioneering referral service in the Metropolitan Region of Paraná, Brazil.

## Material and methods

All reports of suspected AACA were assessed between January 2005 and December 2015, subdivided into physical, psychological, and sexual abuse, as well as neglect. Of the cases of physical abuse, all those with a record of fractures were

separated for evaluation. Exclusion criteria were incorrectly completed notification, illegibility, or loss of medical chart.

The monthly and annual distribution of notifications were assessed, as well as the proportion between total number of victims of physical abuse and occurrence of fractures. The following data were collected from patients victims of physical abuse and with fractures: age, gender, probable aggressor, topography, number of fractures per patient, and occurrence of death.

For patients whose radiographs were available for evaluation in the electronic or medical record system, fracture characteristics were collected, including location, and classified using the Müller AO classification as simple (A), wedge (B), and complex (C) diaphyseal fractures.

The study was approved by the Institution Review Board; under No. 47209215.0.0000.0097.

## Results

A total of 3125 reports of abuse between January 2005 and December 2015 were retrieved. Among the forms, the vast majority was related to sexual aggression, 2144 cases (68.6%). Physical violence was identified in 500 patients (16%), mostly minor musculoskeletal injuries (bruises, contusions, abrasions); of these, 12.4% ( $n=62$ ) presented fractures (Table 1).

There has been a steady increase in notifications over the years, as shown in Fig. 1. An increase in physical aggression was observed, from 11% in 2005 to 23% in 2015, as well as in the number of fractures, from 4% to 10%. Some fluctuations in relationship to the number of cases were observed, with peaks in some years, such as 2008, but the main increase was from 2011 onwards.

As shown in Fig. 2, young children comprised most of the victims of abuse. A total of 50 cases (80.6%) were observed in the age range of up to 3 years, and 36 cases (58%) in the age range of up to 1 year. As age increases, these fractures become less prevalent, with a new peak in adolescence.

Among children who were victims of abuse, a male predominance was observed, corresponding to 38 boys (60%). Both parents and the mother alone were suspected to be the aggressor, corresponding to 17 cases each (27.5%). The father

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