

ORTHOPEDIC TRAUMA IN PEDIATRICS: EPIDEMIOLOGICAL FINDINGS

Luiz Carlos Gonçalves Filho

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Davi de Souza Nogueira

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Andreia Karine Kuhn

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Milena Arpini Machado

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Camila Bento Soares Miranda

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Demison de Oliveira Neves

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Carla da Silva Ferreira

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Loyse Christine Fontenelle de Oliveira

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Juliana Quirino da Silveira

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

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Fernanda Ferreira Silva

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Alciane Barbosa Macedo Pereira

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Joaquim Thiago Moura Carvalho

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Raisa D' Ricolli Rebouças Rocha

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Maria Caroline Schiavini Gongoleski

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Denes Silva Mendes

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Lara Júlia Veríssimo Marra

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Bernardo Machado Bernardes

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Camila Oliveira Câmara Ferreira

Centro Universitario Alfredo Nasser
Aparecida De Goiania-Go

Isac Gervino Rodrigues Silva

Universidade Federal Do Pará
Belém-Pa

Kallaiho Kevin Dantas Naimayer

Universidade Do Estado Do Pará
Belém-Pa

Abstract: External causes and trauma in general have significant consequences for the health of a population, with important consequences for society. They are responsible for high health care costs, human losses, temporary or permanent disabilities generated, and lost contribution days, being considered of broad interest to public health in Brazil and in the world. Pediatric orthopedic trauma is part of external causes, being of interest mainly in terms of knowledge of the profile of its victims with a view to establishing preventive measures. **GOAL:** To analyze the factors associated with pediatric orthopedic trauma. **METHODS:** This is a descriptive study of bibliographic review. Works researched on Google Scholar, Lilacs, Virtual Health Library and Scielo platforms were part of the study. For the selection of the sample, a qualitative selection of articles was carried out, where the theme as epidemiology of orthopedic trauma in pediatrics was carried out. **RESULTS AND DISCUSSION:** Statistical significance was found for the variables sex, age, market situation, type of trauma and affected body part. Males were predominant between both groups, with greater participation among individuals (69.3%). Overall, mean age ranged from 3 to 9 years. In pediatrics, trauma injury is considered the main cause of death in the world and can harm the development of the child. Closed fractures represented 78%, with urgent hospitalization in 90% of the cases, with the accident due to a fall as the underlying cause in 49.17%. **CONCLUSION:** In view of this, it is concluded that orthopedic fractures in pediatrics have characteristics similar to those described in the literature, with fractures in male and school-age children being the most prevalent, mainly in the upper limbs, due to car accidents and falls.

Keywords: Trauma, Orthopedics, Pediatrics.

INTRODUCTION

Orthopedic trauma is part of the large group of external causes, and is basically characterized by injuries to the musculoskeletal system. It has multiple etiologies and is expressed through various injuries, ranging from small bruises and torsions to large fractures with serious complications to the health of the individual. Its consequences include, in addition to questions related to the individual's physical well-being, others related to social and economic aspects, mainly due to the temporary or permanent disabilities generated (Santili C, Gomes. 2010). This topic is of great interest for study in the context of public health in Brazil, with emphasis mainly on the need to adopt preventive measures. This study was carried out due to the need to know the main characteristics related to the occurrence of orthopedic trauma in children.

It is worth remembering that within hospital institutions one of the largest clinics for care is orthopedics. It is considered one of the most responsible clinics for the overcrowding of the Emergency Care sectors and for the large proportion of surgical procedures performed in hospital institutions, mostly due to traumatic conditions.

In the United States of America (USA), data for the year 2001 point to the occurrence of 157,078 fatal victims, mostly due to transport accidents, and almost 30,000,000 victims with non-fatal injuries, mainly due to falls in general. The victims are mostly male.

In Latin America, according to Cardona et al., mortality rates from external causes from 1980 to 2005 in Argentina, Brazil and Colombia showed similar distributions according to gender and age group, with the highest mortality rates observed in Colombia. According to the authors, between the years 2003 to 2005, the mortality rate from external causes in Argentina was 5.0, in Brazil 13.3 and in Colombia 15.9 per 1,000,000 inhabitants.

According to Mesquita Filho and Mello Jorge: "Studies on the distribution, frequency and possible determinants of health problems caused by external causes are of great importance for approaching and recognizing a reality with serious consequences. The main objective of studies related to external causes is to identify their characteristics, with the aim of outlining preventive measures for the main mechanisms of trauma in each region.

Orthopedic trauma is a consequence of violent action and includes injuries to the musculoskeletal system such as contusions, sprains, dislocations and fractures. It presents expressively in different parts of the world, having in common the higher proportion of males, with variations according to age group. In general, trauma is becoming one of the leading causes of death in most low- and middle-income countries around the world.

In addition to these factors, Zhen-Sheng et al.⁴⁰ describe the influence of the environment on trauma where, with the rapid economic development in China, there has been an increase in the number of vehicles on the roads, with a consequent increase in musculoskeletal trauma. It is important to consider that trauma can lead to a whole family breakdown, with serious social problems considering the high risks of morbidity expressed through disabilities, mainly because they affect mostly young and economically active individuals. Inserted in orthopedic trauma, fractures and their epidemiology may vary in different countries according to the age composition of the population, violence and risk of trauma, among others.

Contreras et al. stated that fractures are one of the most common pathological events in a man's life, with different characteristics, locations and levels of severity according to age. In the elderly, fractures are usually the result of low-energy trauma such as falls at home, mainly determining fractures of the

proximal femur, distal radius and spine.

As for the factors associated with orthopedic trauma, in general, in the daily observation of the care routine, it is observed that most of them are directly related to three types of accidents: traffic, work and domestic. According to data from DATASUS (2022), in Brazil transport and traffic accidents were responsible for about 15% of hospital admissions in 2009 (134,260 admissions) among the total number of admissions due to external causes (883,447 admissions), totaling one cost of R\$ 163,387,450.28 million reais, about R\$ 1,217.00 per hospitalization. ADL also includes school accidents and violence resulting from confrontations between children under 10 years of age.

Analyzing data on domestic accidents in children from the European Union and Portugal, Santos stated that 43.6% of ADL notified by a registration system in Portugal were in children aged 0 to 14 years old, with a higher frequency in children of the same age. or less than 4 years. The most frequent mechanism of injury was falls (66.7%), followed by trauma from a foreign object and compression/cutting. The most frequent type of injury was contusion (49.7%), and the limbs and head were the most affected parts. In Brazil, most of the data refers to domestic accidents involving mainly children and the elderly, with falls being the main trauma mechanism. According to Souza et al., domestic accidents in children are one of the main causes of hospitalization and morbidity and mortality in this age group. They have become somewhat common and expected and are closely related to the family's behavior.

According to Urquhart et al., studies on orthopedic trauma focus on studies on patients with multiple traumas, which end up excluding the analysis of isolated traumas. They do not provide a comprehensive description/explanation of orthopedic

trauma, with the need to characterize it and develop comprehensive data collection systems regarding orthopedic trauma.

In a study carried out by Martins and Andrade⁴³, which sought to analyze accidents and violence in children under 10 years of age in the southern region of Brazil (Londrina/PR), it was observed that most injuries resulting from external causes in this age group are considered to be of low risk. complexity, the authors reporting the need for decentralization of emergency services to other units such as the basic units for care, with a reduction in the stress experienced by the child and family members involved.

According to Hebert et al.⁷⁵, of the total number of patients treated with any clinical or surgical pathology, at least 15% of them suffer from an orthopedic or traumatological problem. Preventive Orthopedics and Traumatology are now a reality in countries where health is a relevant aspect, both because of greater precision in counseling and because of the detection and even treatment of certain congenital disorders at an early stage. It is necessary to consider the costs arising from the morbidity and mortality of orthopedic trauma, as well as the overcrowding of hospital beds in Brazil, where the establishment of measures aimed at prevention or actions to reorganize the flow of care are relevant as they help to improve access to health services.

Children have proportions, shapes, sizes and volumes of regions, organs and peculiar structures that are related to adaptive needs for age (Tavano, 2008). In addition to the characteristics inherent to the child, accidents and violence in childhood, there are also differences with regard to gender, age group, place of occurrence and the way in which they occurred (Silva, et al., 2010; Harada, et al., 2003). Trauma injuries in childhood represent suffering, guilt and loss for the family, being considered a social problem (Canabarro, 2004).

Therefore, trauma in the pediatric age group can result in irreversible damage, whether social, physical or psychological, and can permanently mark the individual's life, as well as the family and society (WHO, 2018).

Accidents in childhood and adolescence are considered a public health problem (CEINFO, 2017). In 2019, the Unified Health System (SUS) spent BRL 89,288,190.48 on hospitalizations due to external causes (Boone, et al., 2018). External causes are important in terms of being the cause of early death and various disabilities among children, adolescents and young adults (Lima, et al., 2018).

Traumatic injuries, in orthopedics and traumatology, constitute the most important cause of death in children over one year of age worldwide, and the second leading cause of hospitalization in individuals under 15 years of age. It was evident that 69% of the patients were male, aged between 5 and 9 years (46.45%). Closed fractures represented 78%, with urgent hospitalization in 90% of the cases, with the accident due to a fall as the underlying cause in 49.17%. In cases where the underlying cause was traffic accidents (9.29%), these were motorcycle accidents in 52.94% of cases. Given this, it is concluded that hospitalized children have characteristics similar to those described in the literature, with predominance of fractures in male children of school age.

Accidents and injuries represent one of the greatest challenges to the health and well-being of children and adolescents. Some authors draw attention to the fact that fractures contribute with a variation of 10 to 25% among all traumas that occur in this age group.

The main procedures performed were closed reduction of diaphyseal fracture of the forearm bones, in 20.22%, and surgical treatment of fracture or physeal injury of the

forearm bones, in 19.12% of cases.

RESULTS AND DISCUSSION

Based on the data obtained, from a total of 62 research participants, males were the most affected (62.9% of children), with the most affected age group being 5 to 9 years old, with (40.3% of cases). Regarding origin, 35.48% of the patients came from the municipality of Aracaju and 64.5% of the patients were from the urban area. The mother was the main caregiver in 59.7% of the cases and most occurrences were on public roads (48.4%) and in the afternoon shift (39%). According to the medical records, 64.5% of the patients arrived at the hospital by their own means, with falls as the main trauma mechanism, in 75.8% of the cases.

Polytrauma was present in 19.4% of the patients, with mechanical trauma in children between the ages of 0 and 12 years being the main cause. Thus, through the results obtained, it was possible to observe a higher frequency of this condition in male children, a finding that matches the results described in the literature (Silva, et al., 2020; Luís et al., 2019).

Studies carried out between 2013 and 2015 in Brasilia reveal that the result for age and sex is considered relevant, since the data found showed higher rates of occurrences in male patients, and the age range for the occurrence of these diseases were in children from 3 to 12 years (Silva, 2017).

Regarding the place of occurrence, the research showed that, in general, the traumas occurred on public roads and homes: places where it is believed that children remain longer. A study carried out by Silva (2017) found similar results, with results of 65.75% on public roads and 26.51% at home. According to the literature, most accidents occur at home because of the wide variety of objects and risk situations for the occurrence of trauma

(Vieira, 2013).

The factors that influence the occurrence of falls in the domestic environment are multifactorial: characteristics such as age or gender, type of housing, floor, space, type and size of furniture, have an impact on the incidence and pattern of unintentional domestic injuries (Oliveira, et al., 2018).

The main injury resulting from mechanical trauma found in the research was skeletal trauma, affecting mainly the bones of the upper limb. A study on orthopedic trauma carried out by Cantão et al. (2021) carried out in a hospital in the interior of Pará, obtained results compatible with the present study. It is noticeable that, in the school age group, the child begins to prove independence and interaction with the surroundings, therefore, they are more exposed to possible orthopedic traumas (Pereira et al., 2013; Santili, et al., 2010)

Such findings are of great importance, considering that orthopedic trauma, in children, can cause irreversible sequelae, with physical, social or psychological consequences (Cantão et al., 2021)

The author also emphasizes the need for main targeting of educational campaigns for the prevention of accidents for male adolescents (4). With regard to age, there was a predominance of hospitalization in children aged between 5 and 9 years, with 46.45%, followed by children aged 10 to 12 years, with 34.43%. The higher incidence of fractures in the 5 to 9 age group may be related to school activity, traffic accidents with falls and sports practice. Up to the age of seven, the most common traumas reported are due to domestic and school accidents; from 5 to 10 years old, being run over are the main causes of fracture, while from 7 to 14 years old, accidents due to falling from a bicycle, sports (football, volleyball, basketball, etc.), skateboarding and so-called sports

activities radicals (Santili C, Gomes. 2010). In a study, where a statistical survey was carried out on orthopedic trauma in children and adolescents, it was observed that in the school age group, children experience greater independence and interaction with society, tending to become expose more to traumas (Lino Júnior W et al.). When evaluating the main procedures performed on children who are victims of fractures or orthopedic pathologies, we noticed that more than 65% of the total refer to procedures performed on the bones of the upper limbs, and, of these, the highest incidence occurs on bones of the forearm. A study of fractures with children observed that the upper limbs were more affected than the lower limbs, representing 76.08% of fractures in the upper limbs, and 23.91% in the lower limbs, and these data are similar to those found in the study in question (Santili C, Gomes. 2010).

In another study on humerus fractures in children, a higher percentage of occurrence of closed fractures was also identified. Given these data, it is observed that there is often a higher incidence of closed fractures in children, regardless of the anatomical location of these fractures.

CONCLUSION

According to the survey results, most trauma cases, important aspects such as sociodemographic data, causes of more incidents of trauma in childhood, mechanisms of trauma, main complications and outcome of the event were identified in the present study.

It is known that trauma is not just a serious illness, but a relevant Public Health problem, due to the fact that it is the main cause of pediatric mortality in developed countries, in addition to determining the presence of transient or permanent sequelae that, consequently, can bring damage to

the physical, social and psychological development of the patient.

Finally, it is essential to carry out more studies to complement the knowledge about pediatric orthopedic trauma, in order to further support actions to promote education

and prevent these events. It is necessary to carry out research that addresses the issue of pediatric trauma, so that this serious public health problem is better understood; and that public prevention policies are adopted.

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