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ORIGINAL ARTICLE

Home accidents in a pediatric emergency room in the South Region of Brazil

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Abstract

Introduction: According to the ministry of health, unintentional injuries are the leading cause of death in children aged 0 to 14 years in the country. According to national and international studies approximately 45% of children's accidents occur at home and they could be avoided. Due to their high incidence and hospital costs, injuries and violence are considered a public health problem. This data collection aims to determine the epidemiological profile of patients treated for home-based accidents in a pediatric university hospital in the city of Itajaí-SC. **Methods:** This is a cross-sectional study with retrospective data collection in which records were obtained from home accidents in patients up to 15 years of age, during the year 2016. **Results:** A total of 186 diseases were studied. There was a greater number of injuries in males (54.8%) and in the age range between 1 and 4 years (50.5%). The highest incidence was the fall (60.2%), followed by intoxications with 21.5% of the cases. It was evidenced that 22.6% of the victims needed hospitalization or transfer. **Conclusion:** In this sense, it is important to emphasize the importance of implementing preventive measures, the only way to reduce the damage, the injuries and the resulting sequels.

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INTRODUCTION

According to data from the Ministry of Health of 2015, unintentional injuries were the main cause of death in children aged 1 to 14 years in Brazil, becoming an important source of concern due to the social impact and the disability they may cause. In the same period, the main complaint described was falls, responsible for approximately 33% of the cases[1,2].

Physical immaturity and curiosity are associated and typical characteristics of children, significantly increasing the risk of incidents at home, a space where the child spends most of his/her time in the first years of life[3]. The lower perception of risks associated with the child's lower motor skills makes them more vulnerable. Statistics show that the younger the child, the higher the rate of unintended domestic injury[4]. The prevention of these occurrences requires intense monitoring of those responsible and behaviors to increase the protection of this age group[3].

The literature shows peculiar characteristics regarding unintentional domestic injuries involving children, since not only the environment; however, the host are constantly modified, a result of the growing technology that increasingly changes the homes associated with the different phases of the child's development[5].

According to studies, approximately 45% of infantile injuries occur at home and could be avoided[6]. In addition, it has been found in the literature that in most situations the child was accompanied by the parents and, in less than 10% of cases, the child was alone at home. For this reason, it is important to note that the presence of the parents in the residence does not guarantee the non-occurrence of unintentional injuries[4].

There is also a mismatch between the importance of the theme and the scarcity of data in the literature, with about 40 articles published in the last 20 years in journals indexed to the virtual health library. Thus, determining the epidemiological profile and identifying the factors involved is extremely important in proposing and experimenting with ways to promote health and reduce the incidence of such episodes.

The present study evaluated the epidemiological profile of patients treated for unintentional domestic injuries in a pediatric emergency room in the city of Itajaí, SC, during 2016.

This is a retrospective and descriptive study, carried out by means of an analysis of the compulsory notification due to negligence and the electronic medical records, concerning the care provided at the Emergency Room (Pequeno Anjo University Hospital) in Itajaí-SC in the period from January 1 to December 31, 2016 and, from these, we selected the cases of unintentional domestic injuries.

The inclusion criteria were: 1) to belong to the age group being seen at the hospital; 2) have received hospital care related to the injuries occurring in the same residence or where he/she spends most of the time (e.g. grandparents' house), as well as, yard and public street in front of the home; 3) have been notified to the supervisory board by negligence; 4) had been admitted during the study period. The exclusion criteria were: 1) patients who were notified for negligence due to other causes, including intentional causes; 2) patients who suffered injuries in settings other than those previously mentioned; 3) hospital care provided outside the study period; 4) patients who did do not belong to the hospital's age group.

After selecting the cases, the electronic medical records were analyzed, from which data was collected regarding the following variables: age, gender, type of complaint, place of complaint (in the home, yard, sidewalk, and garage), month of occurrence and outcome of the case. The specific mechanisms of trauma were described for the main causes of injuries. The data was analyzed and described using frequency measures and proportions, in order to trace the epidemiological profile of these patients.

The present study was submitted and approved by the Ethics Committee of the University of Vale do Itajaí, with approval number 2,098,610 on June 4, 2017. Data collection began on June 12, 2017, in compliance with all articles of resolution 466/12.

The authors declare no conflict of interest.

RESULTS

During the study period, 186 patients were treated in the pediatric emergency room of the Pequeno Anjo University Hospital (HUPA), for unintentional domestic injuries, corresponding to an incidence of 4.6 injuries per 1000 visits.

There was a slight male predominance with 54.8% of patients having not completed 12 years of age. As far as the age group is concerned, 64 (34.4%) injuries occurred in children younger than 1 year; 94 (50.5%) in children from 1 year to less than 4 years; 28 (15.1%) in children from four to 14 years. The types of aggravations by age group are presented in Table 1.

As far as trauma is concerned, this study found that bed fall accounted for one third of the cases of all falls (33.1%), followed by falls of heights above one meter (13.6%), stairs (12.7%), couches (7.6%), height and comfort (6.8% each), walker (5.1%), someone else's arms and stroller (4.2% each), and other places, which combined totaled 5.8%.

We also found that in 6 cases, 5 were due to trauma caused by fall from the walker on stairs and 1 case due to falling from someone's arm of the neck in stairs.

Concerning intoxications, the second cause of injuries, 57.5% of them occurred with medicines, 20% with cleaning products, 15% with rodenticides, 5% with alcohol and 2.5% with insect repellent.

The injuries were blunt in 60% of the cases. Hot liquids in 63.6% of cases caused burns, by electricity in 18.2% and by contact with motorcycle's exhaust pipe and hot oven in 9.1%.

Regarding the outcome, 35 (18.8%) cases were discharged soon after the initial care; 109 (58.6%) cases remained in observation; 42 (22.6%) cases were followed for hospitalization, of these 30 (71.4%) were admitted to the hospital ward,

Table 1. Children victims of unintentional domestic injuries, according to age, gender and type of injury. HUPA Itajaí-SC. Brazil, 2016

	Categorized Age and Gender										
	Younger than 1 year		From 1 to 3 years		From 4 to 6 years		From 7 to 11 years		From 12 to 14 years		Total
	F	M	F	M	F	M	F	M	F	M	
Falls	25	34	20	22	3	3	2	3	0	0	112
Intoxication	1	2	11	16	1	3	0	3	3	0	40
Injury	1	0	2	8	2	0	1	1	0	0	15
Burn	0	1	4	5	0	0	1	0	0	0	11
Hit by car	0	0	1	1	0	1	1	0	0	0	4
Foreign body	0	0	2	1	0	0	0	0	0	0	3
Drowning	0	0	0	1	0	0	0	0	0	0	1
	27	37	40	54	6	7	5	7	3	0	
Grand total	**64**		**94**		**13**		**12**		**3**		**186**

F: female M: male. Source: Authors (2017).

7 (16.6%) were transferred to other specialized services and 5 (12%) required intensive care unit (ICU) admission.

In relation to the month of the year, there were 4.63 domestic injuries for every 1,000 visits in the ER. There was a higher incidence in the months of January and February, totaling 41.9% of the visits.

For a 5% alpha, we had a CI between 3.96 and 5.29 treatments for every 1000.

Graph 1 shows the distribution of monthly visits for home-related injuries during the year 2016.

Regarding the place of occurrence of the injuries, 94.1% of them happened inside their own homes and 4.8% occurred in the vicinity of their homes, such as backyards, balconies and other outdoor areas.

DISCUSSION

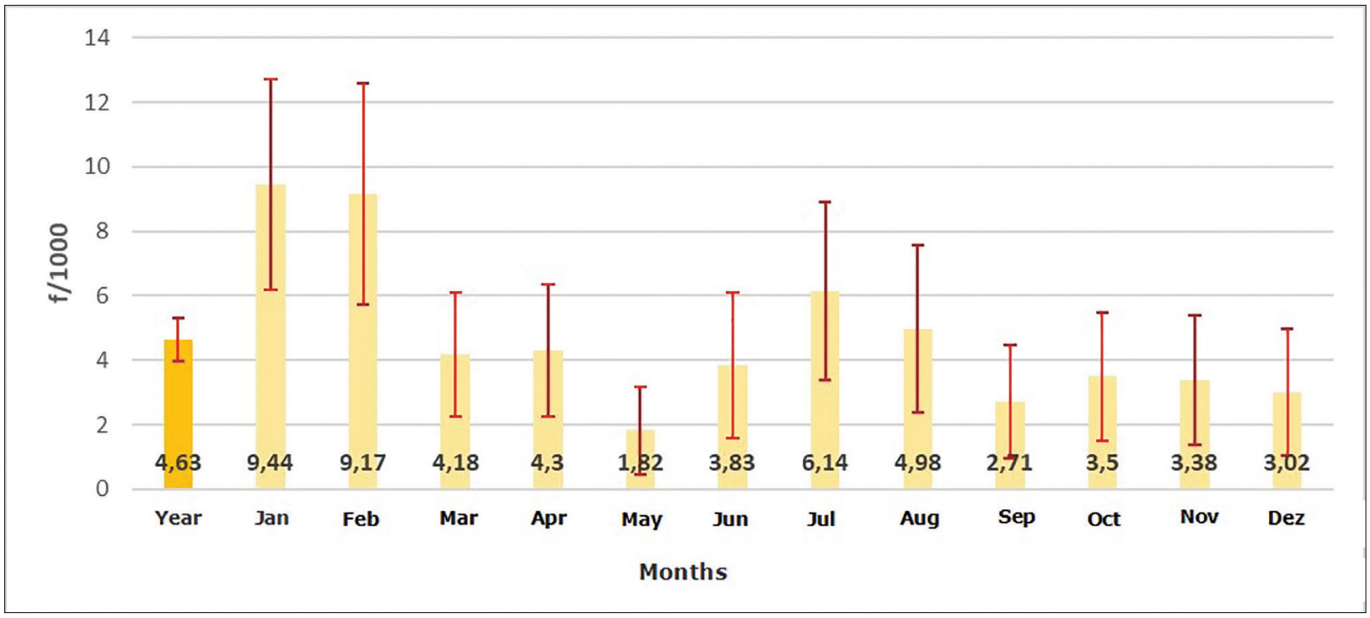
The age range from one to four years of age corresponded to the peak of the highest incidence of home-based accidents found in this study, accounting for 50.5% of the cases. Similar data was reported by Canabarro[7], with 53.4% of the victims being between one and four years of age. However, in a study carried out by Andrade et al.[8], analyzing 508 medical records from a pediatric emergency room, the most affected age group was between 7 and 12 years of age, with 192 victims (37.79%), followed by a period of one to three years with 164 (32.28%) victims. The domestic environment is one of the main places where these events occurred, as it is usually the place where children between the ages of zero and five spend most of their time. It is precisely at this stage that they are more vulnerable to accidents, due to the process of adaptation and exploration of the environment, as well as the lack of knowledge about the risks involved in their actions[3,8].

According to the data found in this study, there were more injuries in males, corresponding to 105 cases out of 186 victims. Similar data was found in the study by Filócomo et al[9], whose sample was 890 children, where 499 (56.1%) were males. Similar information was also found in other studies[7,8]. Differences in behavior and differentiated education between the genders can be a justification for the predominance of accidents among boys, who play games with greater potential for injuries such as skateboarding, cycling, fighting and soccer[10].

Regarding the types of accidents, in a study with 120 children from zero to six years of age performed by Canabarro et al. in 2004, falls corresponded to 56.6% of the cases. Two other studies also found similar data highlighting falls (67.1% and 63%, respectively) as the main type of complaint in the pediatric group[8,10]. Phytocomo and colleagues[9] demonstrated that falls from heights was the most prevalent type (60.9%), and the remainder consisted of falls in the following places: bed (13.5%), bicycle (12.3%), stairways (9.2%), chair (6.1%), wall (6.1%) and others. In this series, falls accounted for 60.2% of all injuries, being the most frequent cause, where one third was due to falls from the bed, followed by falls from heights of more than one meter, stairs, sofas, height, comfort baby, walker, lap, cart and other places. Also, we found the association of two types of injuries in 6 cases, 5 of them with falls from the walker on a ladder and 1 case of fall from someone`s arm onto stairs.

Although the Brazilian Society of Pediatrics (SBP) recommended banning the use of baby walkers in 2013, it is still used and it is directly related with serious household injuries, which further reinforces the need to educate caregivers regarding risks of using it[11].

It was also found that falls were the most prevalent event in all age groups, up to 11 years of age, which is justified by the child's motor, cognitive and proportional development, during which time he unravels his limits and recognizes the environment. The large number of falls from bed in infants translates the need for greater attention on the part of the caregivers when performing tasks that can cause distraction, even for seconds, as when turning to pick up the diapers, clothes or objects of daily use[12]. In addition, even after this period, it is noticed that falls continue to occur, as children



Graph 1. Number of domestic acidentes for every 1,000 children seen in the ER according to the month of occurence. HUPA Itajaí-SC. Brazil, 2016.

begin to practice leisure activities as well as to having greater experience in sports such as roller skates, cycling and others[4].

According to a study carried out in the Campinas region, intoxications were responsible for the fifth most frequent cause of aggravations, occurring mostly by medications[13]. In this study, intoxications accounted for the second cause of aggravations, where more than half were due to medications (57.5%). The presence of drugs in easily accessible places at home and the use in front of children are factors that contribute to drug intoxication. In addition, it was found that 20% of intoxications occurred with cleaning products. To reinforce the data obtained, a study carried out in a reference center of information and toxicological assistance showed that the low toxicity sanitizers were responsible for 38.9% of the cases[14].

It is always relevant to reinforce the need to keep these products out of the reach of children, especially for the age group of one to three years, which involved 27 of the 40 cases of intoxication (67.5%) in this study.

Burns accounted for 5.9% of all the cases, and in more than half (63.6%) hot liquids, followed by electric shocks (18.2%), caused them. In the study carried out by Canabarro et al.[7] in a reference hospital specialized in children's trauma, burns were the second most common complaint among the patients who were hospitalized, which happened due to the direct action of fire, burn by hot liquid and electric shock in the majority. The disparity between the data can be explained by the fact that this study involved the care of patients in emergency care, and not in the hospitalization units. Therefore, we can state that letting the children freely use and be in the kitchen makes this space a potential environment for the occurrence of burns[7].

The analysis concerning the incident`s location and the caregiver present at the time it occurred, was hampered by the lack of information in the medical records, which reinforces the need for investment in improving the recording of data by healthcare professionals. In addition, the definition of domicile applied in this study excluded the public road that leads to it, taking into account only those that occurred around the residence. Thus, 94.1% of the injuries occurred within the home, with only 4.8% of them in the vicinity of the home as backyards, patios and external areas.

Other authors reinforce in their analysis that the number of low-complexity cases that go through health care is small when compared to the total number of injuries that are managed at home by caregivers and that, therefore, it becomes difficult to know the real extent of the problem[5,15].

In this study, there was an increase in the number of cases in the months of January, with 9.44; and February, with 9.17 incidents for every 1000 visits to the E.R. It is believed that this is so because these months correspond to the period of school holidays; thus, they result from a longer stay of these children and adolescents in their homes, facilitating the occurrence of injuries. No similar studies were found to compare these data to in the literature.

Regarding the outcome, it is noteworthy that the great majority of the incidents were of low complexity, since a small percentage in relation to the total number of visits was transferred or sent to the ICU. In a study carried out in the interior of São Paulo state, 94.34% of the children were evaluated and discharged immediately, confirming the hypothesis regarding the complexity of the injuries[16]. Andrade et al.[8] reinforced hospital discharge as the most frequent outcome in 94% of the

cases. However, according to Souza et al[5], childhood injuries should not be neglected, since they occupy a prominent place in child morbimortality statistics, despite its underreporting.

FINAL REMARKS

Our results showed a higher incidence of home-based accidents treated in an emergency room, involving children between one and four years of age and a slight predominance of males, results similar to those described in the literature.

Falls represented the most frequent type of injury, with 60.2% of the total, falls from the bed, stroller, baby carrier, of the height itself; nonetheless, what is noteworthy are falls from baby walkers (5 cases associated with this type of fall, despite numerous campaigns, widely publicized by the Brazilian Society of Pediatrics, speaking against this equipment.

It is worth noting the greater incidence of injuries in the months of January and February, a period corresponding to school vacation, when the child spends more time at home. This fact brings with it a series of questions: whether the children remain under the supervision of an adult during the vacation. Whether the families are structured to keep children at home during the entire school vacation. What can be done to make the home environment safer? What can be done to make the caregiver more skilled? After all, it is at home that children should be safer and better protected.

There is evidence of the need for further studies on home-related accidents, with larger populations and for longer periods. However, it is clear that measures are necessary to reduce such incidents, either through prevention and educational campaigns or by social means of protecting the children belonging to parents who work during the school holidays.

Regarding prevention campaigns, in a survey carried out with mothers to investigate about information received concerning the prevention of unintentional injuries, 35.7% of them reported never having received education about it[17].

In general, prevention is more effective when it permeates three levels of coverage, that is, primary prevention, to avoid injuries by removing the relevant risks and hazards; secondary prevention, to minimize the severity of the injuries, when the traumatic event could not be avoided; and tertiary prevention with rehabilitation, providing support to the victims to return to their full capacity prior to the traumatic event, with the lowest degree of disability[18].

The authors suggest the implementation of preventive actions to be performed in the pediatric emergency room itself, such as educational videos and pamphlets that can alert parents/guardians to the danger of injuries at home. However, they understand that only public policies aimed at promoting safe childhood protection and the empowerment of caregivers will actually produce population impact and avoidable harm reduction at this vulnerable stage of human development.

Thus, basic prevention actions are summarized in areas that involve:

Education: Increasing awareness concerning the risks of these events in a variety of settings, and providing information and guidance on how to minimize them.

Environment: improvements and adaptations in the planning and design of homes and recreation sites.

Community: empowerment, involvement and participation could generate a stronger sense of commitment and community-driven prevention initiatives that would better reflect local and regional needs.

Regulations and legislation on child safety: it is important that products perform reasonably and that new housing meets an acceptable level of safety.

Some strategies combined have a greater effect to ensure safer environments, especially when they bring together supervision, early education and appropriate legislation.

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