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Unintended Injuries Evaluated in the Emergency Room of a Third Level Pediatric Hospital in Dominican Republic

Lesiones no intencionadas atendidas en la emergencia de un hospital pediátrico de tercer nivel de República Dominicana

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ABSTRACT

Introduction: The term *unintended injury* is defined as that injury not caused in a premeditated manner; being one of the most frequent causes of death among children of all ages. **Material and Methods**: A descriptive, cross-sectional analysis and retrospective data collection study was conducted in the emergency database of a third level pediatric hospital from the Dominican Republic, with the objective of Determine the prevalence of unintended injuries. **Results**: The total prevalence of unintended injuries was 12.1%. The most frequent sex was male with 61.6%, most frequent age range 1-14 years with 29.2%. According to the diagnosis, trauma is in the first place with 94.1%, highlighting that this is the main diagnosis in order of frequency in both sexes. **Conclusions:** The total prevalence of unintended injuries was 12.1%. The most frequent sex was male. In all unintended injuries identified, the most affected age range was 1-4 years.

Keywords
injuries and trauma; accidents; drowning.

RESUMEN

Introducción: El término de *lesión no intencional* se define como aquella lesión no causada de forma premeditada, y una de las causas más frecuentes de muerte entre los niños de todas las edades. **Material y métodos**: Se realizó un estudio de análisis descriptivo, de corte transversal y recolección de datos retrospectiva en la base de datos de emergencias

de un hospital de tercer nivel de República Dominicana, con el objetivo de determinar la prevalencia de las lesiones no intencionales. **Resultados**: La prevalencia total de lesiones no intencionadas fue del 12,1 %; el sexo más frecuente fue el masculino, con un 61,6 %, y rango de edad más frecuente fue 1-14 años, con un 29,2 %. De acuerdo con el diagnóstico, los traumatismos están en primer lugar, con un 94,1 %, y se destaca que este es el principal diagnóstico en orden de frecuencia en ambos sexos. **Conclusiones**: La prevalencia total de lesiones no intencionadas fue del 12,1 %. El sexo más frecuente fue el masculino. En todas las lesiones no intencionadas identificadas el rango de edad más afectado fue el de 1-4 años.

Palabras clave
heridas y traumatismos; accidentes; ahogamiento.

Introduction

The term *unintended injury* (UI) is defined as that injury that is not intentionally caused, and that is one of the most common causes of death among children of all ages. In 2013, UL worldwide accounted for 15.4% of approximately 2.6 million recorded deaths for the population aged 1-14 years (1). According to the World Health Organisation, it is estimated that approximately 100 children worldwide die every hour from injuries, 90% of which are unintended (2).

In the Dominican Republic, Law 136-03 establishes the code for the protection of the fundamental rights of children and adolescents, which, in Article 19, specifies that they must be protected from all forms of injury, physical or mental abuse, neglect, negligent treatment, maltreatment or exploitation which is why it is mandatory to evaluate the possibilities that affect compliance with the entire code. (3).

The most common forms of UL in children are: traffic accidents, drowning, poisoning, thermal injuries and falls (4). The UL in children under 5 years of age occur predominantly in the home, where they spend a great deal of time (5). Risk factors in the home include stairs, unprotected metal windows, unstable furniture, storage of pesticides, medicines, poisons, exposed water buckets, easy access to the stove or to utensils such as knives (6).

Many of these injuries are treatable, but despite this, secondary disability, even a mild one, can affect a child's quality of life for two to three years (7), because apart from the medical consequences of these injuries, a prolonged absence from school may occur, which will have consequences for the child's educational progress (7). This not only affects the child, but also implies that the parents will be absent from their jobs, which will reduce the economic income needed by the family (8).

The types of UL are different according to the age of the child, so it is very important to understand this aspect in order to implement measures that are consistent and effective related to the educational issue of child safety (9).

The American College of Emergency Physicians and the American Academy of Pediatrics reported that only 6% of emergencies in U.S. hospitals are fully equipped for pediatric care. They also emphasize that many of these centers are far away, which is worse in rural areas, where in some cases they do not have access to them (10).

It is necessary to address the issue of prevention in the ULs, since it is necessary to focus on the aspects of empowering communities on this issue, including healthcare professionals (11).

The objective of this research was to determine the prevalence of ULs, and thus establish sex, age and most frequent diagnoses at the only third-level pediatric hospital in Santo Domingo North, and one of the fourteen pediatric hospitals in the Dominican Republic.

Material y methods

A descriptive and cross-sectional study with retrospective data collection from a secondary source was conducted using the database of the emergency department of the Hospital Pediátrico Dr. Hugo Mendoza, between January and October 2019. The earliest date of entry was considered to be the date of admission to the healthcare system.

The search included the terms trauma or injury, which encompassed the diagnoses (s00-s99) of head injury, neck trauma, chest injury,

trauma to the abdomen, lumbosacral area and pelvis, trauma to the shoulders and arms, trauma to the elbow and forearm, trauma to the wrists and hands, knee and leg trauma, ankle and foot trauma, multiple injuries, unclassified head, neck and other injuries, accidents (T66-T78), drowning (T66-T78), poisoning (T36-T65), burns (T20-T32), to identify all patients with UL who attended the health center during the study period.

Once the inclusion criteria were established, the duplicate records were eliminated and the database was cleaned up. Data were described in time (frequency) and person (age, sex and type of UL). Those records with a diagnosis of (T79-99) traumatic complications, surgical complications, post-traumatic complications not otherwise classified were excluded from the analysis.

The prevalence was calculated around the relationship of the evidenced cases with the population served by the health center. The data were expressed in simple frequency and dispersion measures, using the SPSS program in its version 23.

Results

A total of 5463 records were obtained, of which 503 were excluded to remain with 4960 UL patients. During the study period, a total of 40,918 patients were observed for the emergency. The total prevalence of unintended injuries was 12.1% (Table 1).

Table 1

General characteristics of unintended injuries

	Total	Percentage
Sex		
Male	3056	61.60
Female	1904	38.4
Total	**4960**	**100**
Age range		
Between 1 and 4	1448	29.20
Between 5 and 9	1359	27.40
Between 10 y 14	1135	22.90
Under 1 year	548	11
Older than 15 years años	470	9.50
Total	**4960**	**100**

According to sex, the male was more prevalent, with 3056 patients (61.6%); while the female presented a total of 1904 patients (38.4%) (see Table 1).

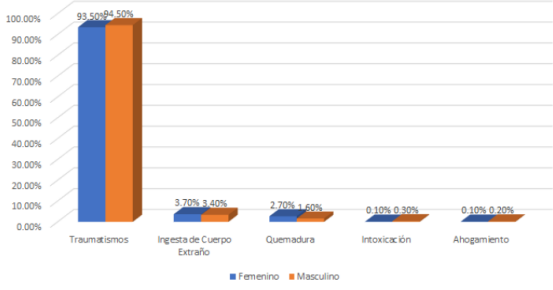
The number of patients, according to age range, were classified as follows in order of frequency: 1-4 years: 29.2%; 5-9 years: 27.4%; 10-14 years: 22.9 %; under 1 year: 11%; over 15 years: 9.5% (Table 1). In terms of diagnosis, the number of patients, in order of frequency, was distributed as follows: trauma in first place with 94.1%, followed by foreign body intake with 3.5%, poisoning with 0.2% and drowning with 0.1% (Table 2).

Table 2
Diagnosis of unintended injuries

Diagnosis	Total	Percentage	Prevalence
Injuries	4669	94.10	114.1/1000
Foreign body intake	174	3.50	4.2/1000
Burn	101	2	2.46/1000
Poisoning	9	0.20	0.2/1000
Drowning	7	0.10	0.17/1000
Total	**4960**	**100**	**121.2/1000**

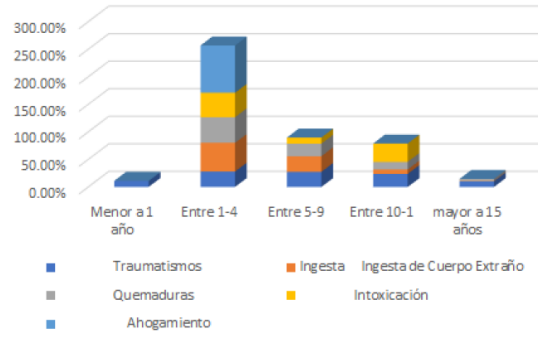
In the distribution of the ULs according to the sex of the patient, the quantities were as follows. For the female sex: trauma constituted 93.50%, foreign body intake 3.70%, burns 2.70%, drowning 0.10% and poisoning 0.10%. For the male sex: injuries were 94.50%, foreign body intake 3.40%, burns 1.60%, drowning 0.20% and poisoning 0.30%. Trauma being the most frequent diagnosis in both sexes (Figure 1).

Figure 1.
Distribution of unintended injuries according to sex of the patient



According to the ULs identified, the age ranges correspond to the following: drownings were more frequent among 1-4 year olds with 85.70%; foreign body intake of 1-4 year olds with 52.30%, followed by 5-9 year olds with 28.20%; in the case of poisoning, the 1-4 year olds with 44.40%; burns occurred in the 1-4-year old group with 46.50%, followed by 5-9 years with 22.80%; injuries happened in the 1-4-year old group with 27.80%, followed by 5-9 years with 27.50%. As can be seen, the 1-4-year old age group is the most affected in all the ULs mentioned (Figure 2).

Figure 2.
Distribution of unintended injuries according to the age range of the patient



Discussion

The prevalence observed in our UL study was higher than that reported by Sastre Paz et al. (12), which was 12.1 vs. 7.68%. This behavior may be due to the sociodemographic characteristics of the populations, as they belong to different regions of the world (Dominican Republic vs. Spain). In our country, higher poverty rates, lower schooling rates, and single-parent families, among others, predominate (13), which are risk factors for the development of UL, together with cultural conditioning factors that favour the occurrence of these events. A high rate of traffic accidents has been observed in our region and country. According to the World Health Organization, the Dominican Republic, one of the 182 countries within the United Nations, has the second highest number of deaths from traffic accidents.

The most frequent diagnosis was trauma, with 94.1%. These data coincide with Arribas Sánchez et al. (4) in a study published in Spain in 2018, where trauma represented more than 90% of these injuries. Among the other causes of UL, we observed a higher frequency of foreign body ingestion (3.7% vs. 1.7%), which may be due to the discrepancy in the affected age groups (4); however, studies in Japan have shown a higher frequency than our results, concerning burns (23% vs. 2.7%) and drowning (6% vs. 0.1%) (1).

The socio-cultural differences in different regions significantly influence the prevention of UL at early ages. The dissemination of information concerning this issue, to which caregivers are exposed (1), may be the reason why our study differs from the exposed age groups in other studies due to the absence of prevention guidelines.

It has been observed in our study as well as in others (9) that male sex is more likely to present UL, as it is the most affected due to increased risk activities and impulsiveness (13). The age range of 1-4 years predominated in our study. ULs in this age group are associated with curiosity, increased free and spontaneous ambulation and exposure to new experiences (1). These results differ from other authors, and an increase in UL in older ages has been suggested due to increased activity (9), coupled with other studies whose predominant age group is between 11 and 15 years (12). The discrepancy in the results may be due to the mechanism of action of the ULs associated with age, as is the case in the age groups over 10 years in which sports activities are frequent. Exposure to physical activities and sports depends on the sociocultural variables of the family (14), and influences the mechanisms of action of the ULs according to the age group and characteristics of the population studied. In addition, since it is a third level public health center, the socio-economic level of the population served belongs to low socio-economic strata (15).

Limitations

It should be noted that our study has several methodological limitations since it focuses on diagnoses and excludes the mechanisms of action and risk factors of ULs, such as sociocultural variables, within which are the characteristics of the family nucleus, to establish a real behavior of ULs. Therefore, a subsequent study is necessary to describe in depth the behaviour of the ULs.

Conclusions

The findings evidenced in our study differ from European and U.S. studies, where ULs predominate during adolescence. The predominance of the age group in our study leads us to review healthcare promotion and prevention guidelines in pediatric and primary care visits to caregivers of these infants to prevent ULs and reduce their frequency as much as possible.

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