

# Epidemiological profile of child victims of everyday life injuries versus road traffic accident

Fadoua Boughaleb<sup>1,2</sup>, Assia Mouad<sup>1,2</sup>, Loubna Aqqaoui<sup>1,2,3</sup>, Hicham Zerhouni<sup>1,2</sup>, Fouad Ettayebi<sup>1,2,1-2</sup> and Houda Oubejja<sup>1,2,3,4</sup>

1-Department of pediatric surgical emergencies, children's hospital of Rabat, Morocco

2-Faculty of medicine and pharmacy, University Mohammed V, Rabat, Morocco

3-Laboratory of Genetic and Biometry, faculty of science, university IbnTofail Kenitra, Morocco

4-Laboratory of epidemiology, clinical research and Biostatistics, faculty of medicine and pharmacy, University Mohammed V, Rabat, Morocco.

## Abstract.

Unintentional injuries (UI) correspond to “unplanned” events; they include everyday life injuries (EDL), road traffic accident (RTA) and work accidents. In our pediatric context, the latter are excluded.

**Aim:** Draw up an epidemiological profile of UI in children hospitalized for at least 24 hours and make a comparison between EDL and RTA. **Material and Methods:** A cross-sectional study conducted during four years, about children hospitalized for UI, in the pediatric surgical emergency department (PSE) of the children's hospital of Rabat, Morocco. Sociodemographic and medical data were analyzed by statistical software (JAMOVI). **Results:** 545 files were retained. EDL represented 81.9 % with a male predominance (70.4%). The median age was 8 years [4; 12] with predominance of school children (63.5%). Infants predominated in EDL (15.1%). Spring has a predominance in RTA (33%), while there is a reversal of the trend for the other seasons ( $p < 0.05$ ). As regards the accident, the majority occurred on weekdays. The injured body parts were multiple for the RTA (39.1%) and affected the limbs (58.5%) for the EDL ( $p < 0.05$ ). Radiological abnormalities were found in 79.6% of cases in EDL. The 24-hour hospital stay was for EDL (66.7%) while RTA is hospitalized beyond 48 hours (53.7%).

**keywords:** everyday life injuries; road traffic accident; hospitalization; comparison; epidemiology

## 1- Introduction

Unintentional Injury is defined as damage caused to a person due to an acute transfer of Energy for which there is no predetermined intent. Unintentional injuries (UIs) are a growing global public health concern in almost all countries. Children are more vulnerable to UIs due to their curiosity to experiment and explore their surroundings, coupled with an inability to understand or perceive danger [1,2]. Children are also at risk of worse injury due to their smaller size and physiological immaturity. In addition, the burden of injury is greater among children since they have more years ahead of them to be affected by disability [1].

Throughout the developed world, child unintentional injury is a leading cause of death [3]. However, it is important to recognize that unintentional injury encompasses a range of injury types occurring in a number of settings [3]. Most childhood accidents include traffic accidents, falls, burns, drownings,

poisonings, and intoxications [4]. Ranging from temporary physical incapacity to more severe and permanent sequelae, or even death [5]. Certain injury events, such as road traffic accidents and house fires, potentially expose those involved to psychological trauma. Some families report increased emotional and financial stress following injury to a child. Severe injuries in children can result in considerable loss of schooling [6].

According to the World Health Organization (WHO), about 6 million people die of trauma worldwide each year. It is estimated that of these, 830.000 deaths and 50 million sequelae are aged from 0 to 14 years and over 90% of deaths occur in developing countries [7].

Despite higher rates of injury-related mortality among children, there is little policy focus on the subject in low and middle-income countries. The lack of recognition of the magnitude of the problem is reflected in the poor availability and monitoring of data, and the dearth of effective prevention strategies to reduce injury mortality

## Objective

The aim of this study is to compare the epidemiological characteristics of everyday life injuries versus road traffic accidents among children admitted at Children’s hospital of Rabat, Morocco.

## 2- Material and methods

### 2-1 Study and duration

A cross-sectional and descriptive study was conducted between January 1<sup>st</sup> 2016 and December 31<sup>st</sup> 2019 in the pediatric surgical emergencies (PSE) department, children’s hospital of Rabat, Morocco.

### 2-2 Population

We included all the patients less than 16 years, who presented unintentional injuries, resulting in a hospitalization. Trauma related to poisoning, intoxication and drowning were excluded because treated in another department.

Verbal and informed consent was obtained from at least one of the parents.

### 2-3 Data

The data were collected from PSE register, cross-checked with the hospitalization register, using a questionnaire covering the demographic, socioeconomic and injury characteristics. The cause of trauma was divided into two groups: Road traffic accident (RTA) and everyday life injuries (EDL).

The patients were divided into groups according to their lesions. Head trauma was defined as a trauma at the head, resulting in vomiting, and loss of consciousness or convulsion. Polytrauma is defined as a patient with two or more injuries, one of them being potentially life threatening. We also stratified the patients by age groups: 0 to 2 years, >2 to 6 years, > 6 to 12 years and Up to 12 years.

### 2-4 Statistical analysis

Data were analyzed using statistical software JAMOVI. 1.6.23. The Chi-square test was used to compare variables between the two groups: Everyday life accident (EDL) and Road traffic accident (RTA).

## 3- Results

During the study period, 545 children with unintentional injuries were admitted at the Pediatric Surgical Emergencies Department, Children’s Hospital of Rabat, Morocco. In 66,8% cases (306 patients), the accident resulted in hospitalization for at least 24 hours. The median age was 8 years [4; 12] with predominance of children aged more than 6 years (63,5%). Injuries were frequently sustained at home (46.4%), especially on weekdays (73%). The commonest circumstances of injury were falls (68%),

followed by collision (19.6%). Some general characteristics are shown on table 1.

Table 1: General characteristics of children victims of unintentional injuries, PSE department, children’s hospital of Rabat, Morocco

General characteristics	n(545)	%
<b>Age group</b>		
0-2 years	70	13.6
> 2-6 years	118	22.9
> 6 years	328	63,5
<b>Cause of trauma</b>		
Everyday life (EDL)	439	81.9
Road traffic accident (RTA)	97	18.1
<b>Time of occurrence</b>		
Sunday	85	16
Monday	81	15
Tuesday	90	17
Wednesday	76	14
Thursday	58	11
Friday	86	16
Saturday	60	11
<b>Hospitalization</b>		
Yes	306	66.8
No	152	33.2
<b>Duration of hospital stay</b>		
24 hours	142	60.7
48 hours and more	92	39,9
<b>Wards</b>		
PSE department	238	96
Intensive care unit	10	4

The causes of UI were represented by everyday life injuries (EDL) (81.9%) and road traffic injuries (18.1%). As shown in Table 2, the median age was 8 years in the EDL and 9 years in RTA, the interquartiles range were [3.5; 2,12] and [5.75; 11.4] respectively. Furthermore, more than a half of patients was more than 6 years of age for both groups (Figure 1). The male predominance was obviously present between the two groups but not statistically significant (p= 0.370).

The proportion of unintentional injuries was not significantly different between children from urban and rural areas (p=0.788).

Most injuries occurred during spring for RTA, contrary to EDL where they occurred in summer and winter with a statistically significant difference (p < 0.05), and mostly during weekdays for both causes (Figure 2).

The Table 3 shows that the lesions included multiple injuries and polytrauma, suffered by 39.1% for children

victims of RTA, followed by head trauma (31.5%), while the most frequent lesion for EDL was limb fracture by 58.5% ( $p < 0.001$ ). The Radiological abnormalities were found in the majority of cases (79.6% in EDL versus 73.5% in RTA).

Around 66.7% of patients were admitted at the PSE department for at least 24 hours for children victims of EDL, while 53.7% of children victims of RTA were hospitalized for more than 48 hours. Surgery was performed in the majority of cases (55.1%) in EDL.

Table 2: Demographic characteristics of children victims of EDL and RTA, PSE department, children's hospital of Rabat, Morocco.

Characteristics	EDL (439)	%	RTA (97)	%	P
<b>Median age</b>	8 years		9 years		<b>&lt; 0,001</b>
	[3.52; 12]		[5.75; 11.4]		
<b>Gender</b>					0.370
Girls	133	30.4	25	25.5	
Boys	305	69.6	72	74.2	
<b>Age group</b>					0.067
0-2 years	63	15.1	6	6.6	
> 2-6 years	94	22.6	20	22.0	
> 6 -12 years	159	38.2	46	50.5	
> 12 years	100	24.0	19	23.5	
<b>Urban/ Rural</b>					0.788
Urban	348	85.7	77	84.6	
Rural	58	14.4	14	15.4	
<b>Days</b>					0.725
Sunday	69	15.7	16	16.5	
Monday	67	15.3	14	14.4	
Tuesday	73	16.6	17	17.5	
Wednesday	61	13.9	15	15.5	
Thursday	45	10.3	13	13.4	
Friday	70	15.9	16	16.5	
Saturday	54	12.3	6	6.2	
<b>Seasons</b>					<b>0.009</b>
Spring	110	25.1	32	33.0	
Summer	127	28.9	13	13.4	
Autumn	76	17.3	24	24.7	
Winter	126	28.7	28	28.9	

Table 3: Clinical characteristics of children victims of EDL and RTA, PSE department, children's hospital of Rabat, Morocco

Characteristics	EDL (439)	%	RTA (97)	%	P
<b>Injuries</b>					<b>&lt; 0,001</b>
Head trauma	126	29,9	29	<b>31,5</b>	
Limb fracture	247	<b>58,5</b>	23	25	
Thoracoabdominal injuries	6	1,4	4	4,3	
Multiple	27	6,4	6	<b>6,5</b>	
Polytrauma	16	3,8	30	<b>32,6</b>	
<b>Paraclinical tests</b>					<b>&lt; 0,001</b>
X-ray	210	54,3	20	23,3	
Head CT	93	24	22	25,6	
Body CT	38	9,8	18	20,9	
Multiple	31	8	26	30,2	
Biology	15	3,9	0	3,2	
<b>Radiological anomalies</b>					0,223
No	76	20,4	22	26,5	
Yes	296	79,6	61	73,5	
<b>Hospitalization</b>					<b>&lt; 0,001</b>
No	141	38,5	10	11,4	
Yes	225	61,5	78	88,6	
<b>Duration of Hospital stay</b>					<b>0,007</b>
≤ 24 hours	110	66,7	31	46,3	
48 -72 hours	28	17	23	34,3	
> 72 hours	27	16,4	13	19,4	
<b>Surgical intervention</b>					<b>0,008</b>
No	88	44,9	30	66,7	
Yes	108	55,1	15	33,3	

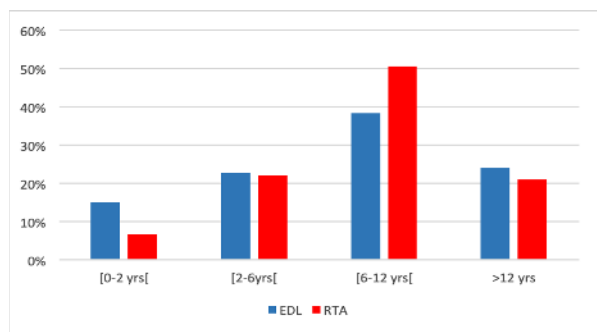


Figure 1: Distribution of children according to the cause and the age group, PSE department, children’s hospital of Rabat, Morocco.

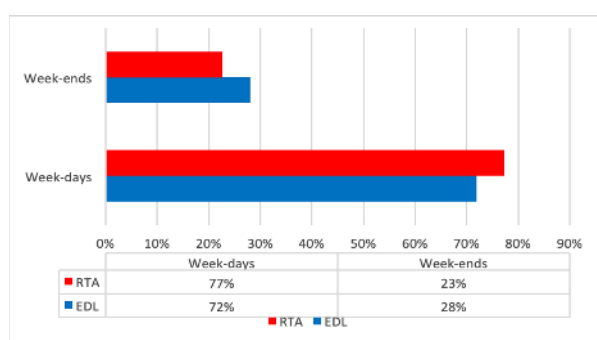


Figure 2: Distribution of children according to the cause and the weekdays, PSE department, children’s hospital of Rabat, Morocco.

#### 4- Discussion:

Unintentional injuries are a major cause of mortality and morbidity among children (up to 18 years) across the globe and contributes to over 875,000 deaths annually. This is equivalent to the deaths caused by measles, diphtheria and polio added together [7, 24].

Childhood accidents result from an interaction between genetic, behavioral, and environmental factors, as well as parental characteristics [11,12]. A number of predictable demographic and socioeconomic status are significant factors related to UI vulnerability. The WHO and UNICEF data reveal the higher UI mortality in low and middle income countries and show that boys are more vulnerable to most forms of UIs in all age groups, which is in concordance with the present study and several studies across the globe [8-10,13-20]. This can be explained by the fact that male children take more risks and are more impulsive than girls [21]. Also, culturally, boys are given relatively greater freedom to explore their environment [6,14].

Our study found that accidents of everyday life are more common than the road traffic accidents. These findings are in concordance with those verified by other authors in Queensland [22], Geneva [7] and

North Kelara [18]. Besides this, Patel. et al. [23] reported that the road traffic accidents account for the majority of injuries in Great Britain, especially pedestrians.

Injury patterns are age-related. For this study infant and younger children are more vulnerable to EDL injuries, while older children show vulnerability to road traffic injuries. Children above the age of 6 years are vulnerable to all forms of UI due to their level of mobility and increased exposure to the environment.

Nirgude et al. [26] studied a wider age group (0–18 y) of children in Andhra Pradesh and reported a higher injury rate (307 per 1000 person-years). In 1962, Gordon et al. reported a morbidity of 126.6 per 1000 person-years in the 0–14 y age group [27]. This striking difference in the morbidity rate may be attributed to the fact that he included injuries causing disability for a day or more, whereas in index study, all injuries excluding trivial ones were included. A report to UNICEF on the Vietnam multi-center injury survey revealed an overall non fatal injury rate of 48.18 per 1000 person-years, which is much lower than index finding [28].

Childhood Unintentional Injury Surveillance estimated that nearly 50 % of children under 12 years suffered from unintentional injuries severe enough to warrant presentation to an emergency room (ER) and had some form of disability [7]. Rivara et al. reported that in the USA, children treated in the ER were more likely to miss school and stay in bed for two or more days, compared to children treated in clinics. More than half of the children (55.9%) had some limitation of activity for 2 days or more.

The impact of the injury also varied depending on the etiology of the injury and child’s age [25]. As in our study, the gravity of the injuries is associated to the length of hospital stay which is longer in RTA than in EDL. This can be explained by the violence of the trauma’s mechanism in road traffic accident.

#### 5- Conclusion

Unintentional injuries are not simply accidents but events that in many cases can be prevented with a better understanding of their cause and appropriate interventional strategies.

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