

**Original Article****Acute Drug Poisoning in Tunisian Children: About 150 Cases***Hager Barakizou\*<sup>1</sup>, Yosra Ben Rjeb<sup>1</sup>, Souha Gannouni<sup>1</sup>, Fethi Bayoudh<sup>1</sup>**Received: 15.10.2015**Accepted: 25.11.2015***ABSTRACT**

**Background:** Acute drug poisoning remains an important public health problem and represents the second most frequent accidental disease in children. In this study, we identified epidemiological and clinical features of children admitted for acute drug poisoning and related factors associated with suicidal poisoning.

**Methods:** We conducted a retrospective study in the Department of Pediatrics, the Military Hospital, Tunis, over a period of 8 years (2008-2014). Children aged less than 16 yr and admitted for acute drug poisoning were included. Cases of drug addiction were excluded. Two groups were compared: accidental poisoning / suicidal poisoning.

**Results:** We collected 150 cases. The ratio male / female was 1:1.2. The mean age was 4.3 yr. Poisoning was due to one drug in 82% of cases. Children were asymptomatic in 39% of cases, had digestive and neurologic symptoms respectively in 30% and 20% of cases, respectively. Psychotropics came in the first place (20%) followed by paracetamol (16%). Two groups were identified: accidental poisoning (74 %) and suicidal poisoning (26%). Four factors were significantly associated with suicidal poisoning: age  $\geq$  8 yr ( $P < 0.001$ , OR= 16.25, 95% IC : [6.44-40.95]), female gender ( $P=0.011$ , OR= 5.4, 95% IC: [2.09-13.91]), multiple drug intake ( $P < 0.001$ , OR= 9.42, 95% IC: [3.05-29.03]) and use of psychotropics ( $P= 0.003$ , OR=4.81, 95%IC: [2.06-11.26]) .

**Conclusion:** Two groups had to be distinguished: accidental and suicidal drug poisoning. The identification of their characteristics and their predisposing factors is necessary in order to take appropriate preventive actions.

**Keywords:** Drug, Pediatric, Poisoning, Suicide.

**IJT 2016 (3): 1-5****INTRODUCTION**

Acute poisoning is responsible for an increasing morbidity and mortality rate worldwide [1]. WHO estimates that near 45000 children die from poisoning every year [2]. Drug poisoning represents one of the most common diseases in children [3, 4]. Its prevalence ranges from 0.33% to 7.6% and represents the second most frequent accidental disease among this population [5].

Two peaks in pediatric exposure are observed; the first between 1 and 5 yr and the second in adolescence [6, 7]. Cause of poisoning varies with age, gender, social and cultural background [8]. It may be intentional or unintentional [9]. Its severity of poisoning depends on the nature of the ingested drug, its amount and the quality of medical care [10].

In Tunisia, little information has been published on acute drug exposure in children [11]. The aim of this study was to give more information regarding this preventable childhood injury through identification of its epidemiological and clinical features as well as search for factors associated with suicidal poisoning.

**MATERIALS AND METHODS*****Identification of Patients***

We conducted a retrospective study in the Department of Pediatrics, the Military Hospital, Tunis, over a period of 8 years (2008-2014). We included children aged less than 16 yr and admitted for acute drug poisoning. Cases of drug addiction were excluded. Poisoning was defined as a clinical manifestation of the adverse effects caused in a living organism because of its

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interaction with some drug [12]. Drug addiction was defined as maladaptive drug-seeking habits that are maintained despite adverse consequences and intense drug craving [13].

### Data Collection and Study Design

Epidemiological, clinical, etiological and evaluative features were analyzed through medical records. Two groups were individualized: group 1 (G1) referring to children with accidental poisoning, and group 2 (G2) referring to children with suicidal poisoning.

### Statistical Analysis

Odds ratios (ORs) and 95% confidence intervals (CIs) were estimated. The Chi-square test and Fisher's exact test were used for the comparison of categorical data between the two groups. Statistical significance was identified with a  $P$  value  $< 0.05$ . Data analysis was performed using SPSS version 11.5 (Chicago, IL, USA).

### Ethical Considerations

Ethical considerations in this paper were carried out. The Ethics Committee of the university approved the study. Informed consent was taken from parents.

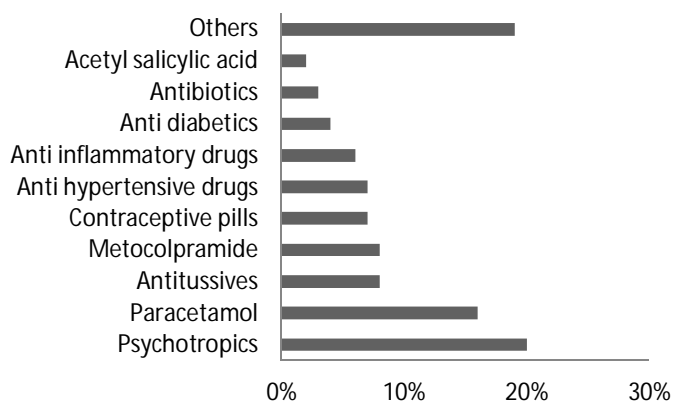
## RESULTS

We gathered 150 cases. Mean age was 4.3 yr [extremes: 45 d-15 yr] and ratio Male/Female was 1:1.2. Further characteristics of the population of study are detailed in Table 1.

**Table 1.** Characteristics of the population of study.

Characteristics	n (%)	
Age	[1month- 2years]	37 (25)
	[2years -5years]	72 (48)
	[5years -10years]	18 (12)
	[10years -16years]	23 (15)
Gender	Female	82 (54.7)
	Male	68 (45.3)
Economical level	Low	24 (16)
	Medium	111(74)
	High	15 (10)
Place of residence	Urban	89 (59.3)
	Rural	61(40.7)
Place of poisoning	Indoors	144 (96)
	Outdoors	6 (4)
Guarded by	Parent	108 (72)
	Baby sitter	15 (10)
	Alone	27 (18)

Average time before consultation was 6.4 h. Children were brought to the Pediatric Emergency Department in the two first hours after poisoning in 36% of cases. Poisoning was due to one drug in 82% of cases. Psychotropics came at the first rank (20%) followed by paracetamol (16%) (Figure 1).



**Figure 1.** Types of ingested drugs.

We noted between 2006 and 2014 a constant frequency of poisoning by psychotropics, an increase of poisoning by paracetamol and a decrease of poisoning by acetylsalicylic acid. Children were asymptomatic in 39% of cases, had digestive, neurological and cardiovascular symptoms respectively in 30%, 20% and 6% of cases, respectively (Table 2).

Depending on initial clinical presentation, different therapeutic measures were undertaken: gastric lavage (62%), activated charcoal (19%) and antidote (21%).

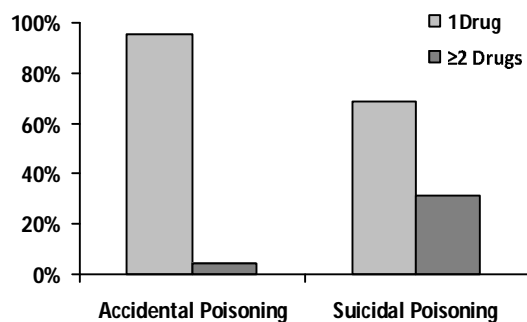
Two groups were individualized: group 1 (G1) referring to children with accidental poisoning and group 2 (G2) referring to children with suicidal poisoning.

G1 and G2 counted respectively for 111 children (74%) and 39 children (26%). The mean age was 3.2 yr in G1 and 10.6 in G2. The number of new cases of suicidal poisoning doubled after November 2013.

An age threshold with suicidal poisoning ( $P < 0.001$ , OR = 16.25, 95% CI: [6.44-40.95]).

G1 included 56 females (50.4%) and 55 males (49.6%). G2 included 33 females (84.6%) and 6 males (15.4%). Female gender was significantly associated with suicidal poisoning ( $P=0.011$ , OR= 5.4, 95% IC: [2.09-13.91]).

In G2, there was reactional suicide attempt in 38 cases and one suicidal attempt in a depressed teenager. The triggering factors in G2 were school failure in 61.5%, family disputes in 28.2%, death in the family in 2.5% and sentimental disappointment in 7.8% of cases. The intake of two or more drugs (Figure 2) was significantly associated with suicidal poisoning ( $P < 0.001$ , OR= 9.42, 95% IC: [3.05-29.03]).



**Figure 2.** Distribution according to the number of drugs and type of poisoning.

In G1, poisoning was due to psychotropics and to paracetamol respectively in 12.6% and 19% of cases. In G2, poisoning was due to psychotropics and paracetamol respectively in 41% and 7.7% of cases. Use of psychotropic was significantly associated to suicidal poisoning ( $P= 0.003$ , OR=4.81, 95%IC: [2.06-11.26]). No association was found between suicidal poisoning and use of paracetamol ( $P= 0.129$ ).

Clinically, differences between suicidal and accidental poisoning are summarized in Table 3.

All children included in G2 benefited from psychological support. Recurrence was noted only in one case: it was a twelve yr old girl with history of voluntary poisoning after school failure and presented with deliberate self-poisoning on parental separation without real death thoughts.

**Table 2.** Most frequent symptoms of acute drug poisoning.

Digestive symptoms		Neurological symptoms		Cardiovascular symptoms	
Type	n (%)	Type	n (%)	Type	n (%)
Vomiting	34 (22.6)	Drowsiness	14 (9.3)	Tachycardia	6 (4)
Abdominal pain	15 (10)	Ataxia	6 (4)	Bradycardia	1 (0.6)
Diarrhea	2 (1.3)	Extrapyramidal syndrome	3 (2)	Hypotension	1 (0.6)
		Bilateral mydriasis			
		Language disorder	2 (1.3)		
		Mental confusion	2 (1.3)		
		Seizures	1 (0.6)		
			1 (0.6)		
			1 (0.6)		

**Table 3.** Characteristics of suicidal and accidental poisoning.

	Suicidal poisoning n (%)	Accidental poisoning n (%)	Comments
Symptoms			
-Symptomatic	29 (74.3%)	61 (54.9)	$P= 0.033$ , OR= 2.37 95%IC :[1.05-5.34]
-Digestive symptoms	14 (35.8%)	36 (32.4)	$P: 0.69$
-Neurological symptoms	18 (46.1%)	12 (10.8)	$P < 0,0001$ , OR: 7.07 95%IC: [2.96-16.86]
-Cardiovascular symptoms	6 (15.4%)	4 (3.6)	$P: 0,01$ , OR: 4.86 95%IC: [1.29-18.27]
Average length of stay	2 (19)	1(16)	≥ 2days associated with G2; $P: 0.023$
Death	0 (0)		
Recurrence of poisoning	1 (2.5)	0 (0)	

## DISCUSSION

Drug poisoning remains a serious public health problem. In Tunisia, its frequency ranges from 1 to 9.3% [14, 15]. We found a concordant frequency of 1.25%.

There is a bimodal distribution with a first peak in preschoolers and a second peak in adolescence [16]. In 80% of cases, age ranges between 1 and 5 yr [17]. This age group represented nearly three-quarters of children included in our study. Two types of poisoning must be distinguished: accidental poisoning and voluntary one [18].

### *Accidental Poisoning*

It remains the most common in children [17, 19-21] in our study; it counted for 74% of cases. Children aged less than 6 yr old are mainly concerned [21]. In our study, the mean age was 3.2 yr in G1. Poisoning can be explained by an inadvertent parental mistake or by children's curiosity [22]. There is generally no sex predominance but some authors report male predominance [22-24].

Poisoning is most often due to one drug and especially analgesics [25]. Our results were concordant with a single drug poisoning in 95.4 % of cases. Paracetamol was used in 19% of cases. Poisoning by aspirin became rare because it is no longer used as first line antipyretic drug in our country.

Accidental poisoning is usually benign (accident with witness) but severe forms have been described with a mortality rate of 0.44 per 1000 [25, 26]. In G1 group, symptoms were essentially mild to moderate. Gastro-intestinal symptoms were predominant. No deaths were noted.

### *Suicidal Poisoning*

Suicide had increased in children in the last decades and represents now the third leading cause of death [27]. Its incidence in children varies between countries. In Tunisia, it was estimated at 3.7 per 100.000 populations [28]. We noted that the rate of suicide attempt had doubled after November 2013. This finding can probably be explained by the excessive media coverage of a case of suicide in a ten years Tunisian girl. Her suicide happened in November 2013 and was related to precarious schooling conditions.

Drug poisoning is used in 59% to 85% of suicide attempts especially in school aged child and adolescent [29, 30]. In our study, an age

years was statistically linked to suicidal poisoning.

Females use preferentially this mean in 65-85% of cases [30, 31]. Our results are concordant with 84.6% of girls in G2.

Multiple drug intakes are often noted with predominance of psychotropics [32]. We found similar results with a significant association between the intake of more than two drugs, use of psychotropics and suicidal poisoning.

Mortality remains higher than in the accidental poisoning, it increases with age and male gender [32, 33]. It can be either a suicide attempt with no real death thoughts (This group represents 97.4% of G2) or reveals an underlying psychiatric disorder especially depression or infantile psychosis [34,35].

## CONCLUSION

Acute drug poisoning remains a public health problem in Tunisia. The frequency of voluntary poisoning is increasing and it constitutes a preferred mean of suicide in children and especially in girls. The best treatment is preventive (safe packaging, parent education, school educational programs). Psychological support is essential in case of suicidal poisoning in order to prevent its recurrence.

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