Deliberate self-poisoning with drugs among adolescents in Morocco

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Abstract. Introduction: Suicide is a serious public health problem and one of the leading causes of adolescent death in the world. The aim of this study is to determine the epidemiological profile of suicidal poisoning with drugs among adolescents in Morocco. Methods: This is a retrospective study of deliberate self-poisoning cases, reported to the Moroccan Poison Control Center between 1980 and 2014. Results: A total of 3,856 cases of suicidal poisoning among adolescents 15 to 19 years old were recorded, with 13 cases of successful suicide and 41 repeated suicide attempts. The average age of the patients was 15.5 years. According to the results, 84.7% were female with a female-male ratio of 5.5. The majority of cases occurred at home (97.8%). The signs and symptoms presented by the patients were varied, depending on the amount of drug ingested and the delay before treatment. Conclusion: Suicide and suicide attempts in children and adolescents continue to be a major public health problem, and topical research and surveys have clearly highlighted suicide as one of the commonest causes of death among young people.

Keywords: Suicide; Drugs; Adolescents; Morocco

1. Introduction

Adolescence has been considered as a period in life when an individual is no longer a child, but not yet an adult [1]. It is also a period of risks, which translates into difficulties and mental issues that could affect adolescent behaviours [2]. Suicide and suicide attempts are topical issue. According to the World Health Organization (WHO), Suicide is a major global problem, in 2015, about 800,000 suicides were documented worldwide, and globally 78% of all completed suicides occur in low- and middle-income countries [3]. The number of suicide attempts is 10 to 30 times higher compared to completed suicides [4-7]. Suicidal behaviours are among the main causes of death worldwide, especially among adolescents and young adults [8, 9]. It is the third leading cause of death for adolescents between 14 and 18 years old in the USA [4]. In Europe, it is the second leading cause of death in male and female adolescents [10, 11]. Globally, suicides are the second leading cause of premature mortality in individuals aged between 15 to 29 years preceded by traffic accidents [1]. For this range of age, over-the-counter drugs are an easy manner to commit suicide. In Morocco, this phenomenon is increasing alarmingly among adolescents. The aim of this study is to determine the epidemiological profile of suicidal poisoning with drugs among adolescents in Morocco.

2. Methods

2.1 Population and data collection

A retrospective study was conducted on all cases of suicidal poisoning with drugs among adolescents 15-19 years old, reported to the Moroccan Poison Control Center over a period of 35 years from January 1980 to December 2014 in Morocco. The Moroccan Poison Control Center (MPCC) collects data through two units of information: Toxicological information and Toxicovigilance, from different ways of declaration.

The following data were collected: age, gender, origin, place of suicide, symptomatology, treatment and clinical outcome.
The age is given according to international standards [12].

2.2 Statistical analysis

Data were analysed with IBM SPSS software Version 20.0 for windows. For statistical comparisons, chi-square test was used to establish statistical associations between studied qualitative variables and outcome.

3. Results

During the study period, 3,856 suicide attempts by self-poisoning with drugs among adolescents were recorded. Of the 2,692 cases, which the clinical outcome is known, 0.5% died (13 cases of successful suicide) and 1.9% of them kept sequelae. The highest rate of suicide by drugs was recorded in the Rabat-Salé-Zemmour-Zaer region with 17.4% of cases, followed by the Oriental region with 13.8% of cases.
The figure 1 showed the distribution per year for all reported cases.

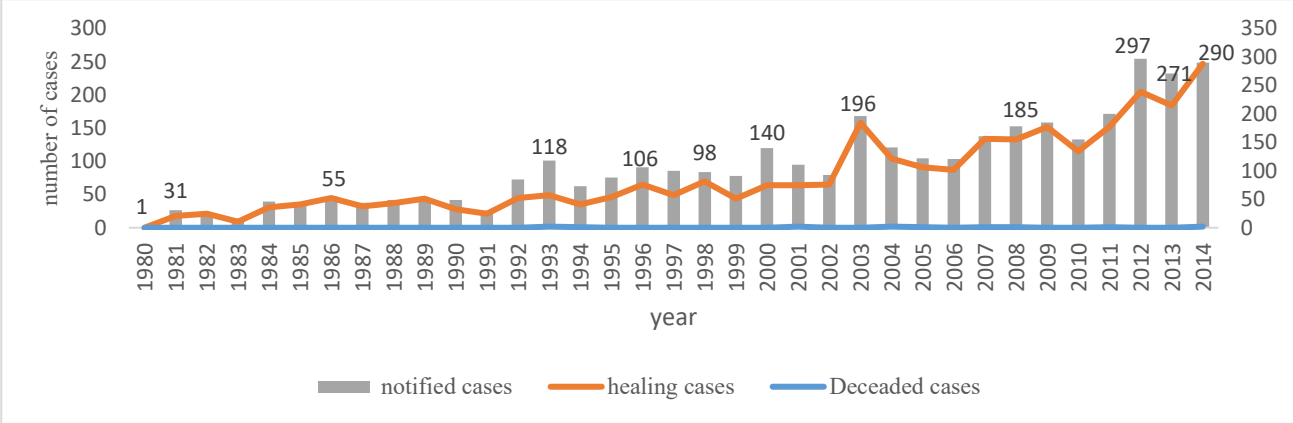

Fig. 1. Annual distribution of reported suicide cases with drugs among adolescents in Morocco, 1980-2014

The distribution per year for all reported cases shows a clear increase in suicide cases with drugs among adolescents with two peaks, one in 2003 with 196 confirmed cases (81% female against 19% male), the second in 2012 with 297 confirmed cases (86.7% female and 13.3% male). The number of death was generally low (13 cases during the study period). Increasing declaration of suicides among adolescents could be explained by efforts emitted by the MPCC to aware the population about drugs risks.

The table 1 presents the epidemiological characteristics of the studied population. The mean age of victims was 17.22 ± 0.02 years old. The sex-ratio (F/M) was 5.5 with 84.7% females (3,235 cases) and 15.3% males (583 cases). Symptomatic victims accounted for 68.5% ($p<0.006$). The majority of reported cases (99.8%) resulted from oral exposure. Almost the third of suicides cases occurred in the spring season (29.1%). The distribution of reported cases according to health services shows that 98.5% were admitted to emergencies. The majority of cases occurred in urban areas (92.2%). Suicide took place at home with 97.8% of the cases. The analysis shows also suicide cases in public places with 1.8%.

Table 1. Characteristics of suicidal poisoning with drugs among adolescents in Morocco,1980-2014

Characteristics	Number of cases (%)	Outcome		p-value
		Recovery	Death	
Gender (n = 3818)				
Male	583 (15.3)	386	3	0.01
Female	3235 (84.7)	2262	9	
Origin (n= 3027)				
Urbain	2792 (92.2)	1977	6	0.029
Rural	235 (7.8)	162	-	
Season (n= 3580)				
Autumn	816 (22.8)	582	-	0.01
Winter	887 (24.8)	607	3	
Spring	1042 (29.1)	731	5	
Summer	835 (23.3)	547	5	
Place of suicide (n= 3226)				
Home	3154 (97.7)	2187	11	0.982
Public place	57 (1.8)	40	-	
School	6 (0.2)	6	-	

Workplace	6 (0.2)	6	-	
Veterinary clinic	3 (0.1)	2		
Route of exposure (n = 3837)				
Ingestion	3833 (99.8)	2663	13	
Inhalation	1 (0.02)	1		0.974
Injection	2 (0.05)	2	-	
Skin absorption	1 (0.02)	1	-	
Type of exposure (n = 3856)				
Single exposure	3815 (98.9)	2661	13	
Repeated exposure	41 (1.1)	18	-	0.001
Clinical status (n= 3856)				
Asymptomatic	1214 (31.5)	806	2	
Symptomatic	2642 (68.5)	1873	11	0.006

The table 2 showed the distribution of clinical signs presented by the victims after committing a suicide with drugs. According to the results, 40.8% of victims had presented gastrointestinal system disorders, 33.8% had developed central and peripheral nervous system disorders, 4.1% with psychiatric disorders. The other affections such vision disorders, urinary, hearth rate and rhythm disorders, skin and appendages disorders… etc., were observed in 21.3% of cases.

Table 2. Suicidal poisoning cases by System Organ Class affected, 1980-2014

System Organ Class affected	**n (%)**	**p-value**
Gastrointestinal system disorders	689 (40.8)	
Central and peripheral nervous system disorders	571 (33.8)	
Heart rate and rhythm disorders	131 (7.8)	
Respiratory system disorders	78 (4.6)	
Psychiatric disorders	69 (4.1)	
Body as a whole – general disorders	63 (3.7)	
Vascular (extra-cardiac) disorders	55 (3.3)	<0.001
Vision disorders	21 (1.2)	
Skin and appendages disorders	4 (0.2)	
Urinary system disorders	2 (0.1)	
Musculo- skeletal system disorders	2 (0.1)	
Hearing and vestibular disorders	1 (0.1)	
Liver and biliary system disorders	1 (0.1)	

4. Discussion

Youth suicide should be considered a serious health problem. The incidence of suicidal ideation increases during adolescence [13]. Drug ingestion was a common method of self-harm and suicide [14-16]. Our findings showed that 3,856 drug suicide cases were committed by adolescent aged between 15 and 19 years, which represent 29.4% of all suicide by drugs cases recorded by the MPCC during 1980 and 2014, with no background of their lives or medical history. In Morocco, this practice is a real taboo, it is forbidden in the Islamic religion, and social context of Moroccan society. Sometimes this practice is not acknowledged or reported, due to its sensitive nature that still surrounds it [17]. So, obtaining real estimates of the numbers of drug suicide among adolescent is more difficult, because data collection is inconsistent and probably just the most severe cases were declared. Drugs are available everywhere, they could be used without a prescription, and adolescent could find them easily in the pharmacies. Our study showed that Bromazepam and paracetamol are the most used drugs with 16.5% and 4.8% of cases respectively. In the United Kingdom, a study showed that most common reason for calls to Poison Control Centers is ingestion of paracetamol [18]. In Scotland, the pattern of drug uses also varies with age; the peak incidence for paracetamol poisoning is at 15-24 years of age [19]. Previous studies showed the use of paracetamol for suicide purpose [18, 20, 21]. In France, it was involved in drug suicide with 45% [21]. All these findings agree with the results of Villa and al. in 2008, for whom this substance was most frequently used, in all ages combined [22]. Paracetamol over dose of this drug can cause liver and kidneys disorders [23, 24]. These findings are likely to be associated with its availability.

Drugs suicide affected the both sexes, with a female preponderance (84.7%). Our results agree with those of numerous studies, which have reported that, the rates of suicide attempts were higher among girls/females than boys/males [25-28]. This dominance is largely found in the literature [29] and is explained by the fact that girls have more suicidal ideation during the critical period of

preadolescence [30]. The use of drugs was found in Tunisia, Iran, Brazil [31-33]. In the United Kingdom, Nordic countries and Canada, drug suicide was common in women; and it is played an important role in male suicide [20]. In general, females more often prefer weak methods than males, and completed suicides in males are often associated with physical injury.

The highest drug suicide rates are shown in urban area with 92.2%, whereas a very lowest rates in rural areas. This difference can be explained by the availability and easy access to drugs, however in rural area, there is an underreporting case, which affect the suicide rates.

In term of season, drug suicide among adolescent were high in spring with 29.1%. This result is consistent with studies conducted in Brazil [34], Turkey [35] and Austria [36].

When suicide occurs, the clinical findings may be distinctive and different according to the drug ingested, its dose and the circumstances. Our study showed that gastro intestinal disorders affected in 40.8% of cases, central and peripheral disorders represent 33.8% of cases.

Most of these cases do not requires intensive medical treatment, but needs caring approach, psychiatric treatment and social assessment. Our findings are consistent with studies that showed the drugs such as psychoactive family and antidepressant family drugs act mainly on central nervous [37]. Most studies showed that suicide is closely associated with mental disorders [38, 39]. Statistics showed about 90% of people who commit suicide have suffered from at least one mental disorders [40]. Unfortunately, our study did not show the psychological state of Moroccan adolescents and the reasons behind choosing drugs as a mean of suicide. Other studies highlight that young people are by nature vulnerable to mental health problems, especially during the years of adolescence [41].

Suicide remains a global health issue, which increase every year especially among adolescent. The originality of this paper is mainly descriptive, relates to a population that is still poorly documented in the literature. In Morocco, the cases of drug suicide among adolescent keep increasing over time, which requires a solid strategy to reduce the number of cases. For drugs, restricting the accessibility can be important in prevention strategies.

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