



Poisoning of the Child by Ferragat: Epidemiological and Evolutionary Aspects at the Level of Pediatric Service in Marrakech

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ABSTRACT

The main objective of this study was to describe the epidemiological and evolutionary characteristics of children infected by Ferragat (PF) at the pediatric ward level of the Ibn Zohr Hospital in Marrakech over a three-year period from January 2013 to December 2015. 58 cases of (PF) were identified (7.97%) out of 727 cases of poisoning received. Children under one year of age were affected in 94% with a male predominance (70%) from the urban environment and observed in the winter and spring periods. Obstacles related to training, management and practice are among the factors hindering Poisonings by Ferragat care.

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Introduction

Poisoning by plants is a common cause of hospitalization in Morocco, and is considered a serious concern because of its severity and the number of victims reported. Plants and traditional pharmacopoeia products are at the forefront of the deadliest poisonous toxins, unfortunately a large part of the population misunderstands the actual toxicity of some plants, leading to inappropriate behavior [1-4]. The use of traditional herbalists (Ferragat: Traditional healer for children) for healing is a common practice in our context. As the results of several studies indicate, children are particularly affected and the circumstances are usually accidental and endanger the child's life. Indeed, poisoning in children is a real health problem in Morocco; More than 30% of intoxicated subjects are children. Poisoning by plants was implicated in 3-5% of all poisonings and is a common cause of hospitalization in Morocco [5-6]. Unfortunately, in Marrakech, a large part of the population ignored the alarming toxicity of some plants, which leads to a delicate management. In Marrakesh, the use of Ferragat for treatment is mainly observed in children [7-8]. The "Ferragat" aim to treat in the newborn and the infants several symptoms and pathologies in particular the digestive, neurological, respiratory disorders, the dermatological infections, the fever, the incessant cries ... [9]. According to Abourazzak S and al, the working methods of the "Ferragat" are based on the application of abdominal scarifications, points of fire and on the administration of oral mixtures: Harmel seeds (*Peganum harmala* L.) and Olive oil, animal hair and animal vertebrae as well as other ingredients: cinnamon (*Cinnamomum cassia* Blume), fenugreek (*Trigonella foenum graecum* L.), nigella (*Nigella sativa* L.), Fennel (*Foeniculum vulgare*), clove (*Eugenia caryophyllata* thun), and watercress (*Lepidium sativum* L.). Other products are therefore used as drops of cade oil (oil extracted from

Juniperus oxycedrus) are either administered orally or applied to a good part of the body of the newborn or infant (face, anterior fontanelle, wrists, Neck, thigh, feet ...) [10,11]. In addition, poisoning is increasingly a pediatric problem in developing countries because of its frequency [12]. On the other hand, pediatric Ferragat intoxication requires rapid and adequate medical and nursing care because of the rapid imbalances in the child. The prognosis depends on the age, the nature of the toxicant, its dose and the duration of the treatment. Therefore, the intervention of the health personnel is essential to evaluate the state of the patient to take charge quickly [13]. It is a problem experienced at the level of pediatric service whose gravity is related to the quality of the care and the reluctance of the parents to hide the origin of intoxication. Thus, according to Belakhder in 1997 [14], the main causes of death in Ferragat-infected children were anuria and severe renal insufficiency after absorption of Harmel seeds. Moreover, the study by Draïss and al (2000-2001) carried out at the CHU in Marrakech revealed a high frequency of intoxications secondary to the practices of "Ferragat", with 126 cases of children aged 0 to 3 years were victims of these practices with a case fatality rate of 14% [15].

According to these studies; this intoxication in pediatrics involves the vital prognosis of the child; the evolution can be severe or even fatal in the absence of adequate management. In particular, the care of these children is a real health problem, particularly for health workers, as they find several difficulties in ensuring this. Nevertheless, the care of children who are addicted to the care provided by the Ferragat is suffering from inadequacies in the pediatric department of the Ibn Zohr Hospital in Marrakech. In order to contribute to the improvement of the management of Ferragat poisonings and their prevention, this study set the objective of identifying the

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epidemiological and evolutionary characteristics of Ferragat poisonings by determining the factors that hinder this support.

Materials and Methods

We conducted a descriptive retrospective study over a three-year period from January 1, 2013 to December 31, 2015. It included all children aged 0 to 15 admitted to the service for proven accidental intake of toxic products or which history and / or clinical examination have found signs of acute intoxication. Information on poisoned children was collected on collection sheets using hospital records and a questionnaire that was developed and tested to provide data collection support to nurses performing their duties at the level of service Pediatrics involved in the care of the intoxicated child. The variables studied were frequency IF, types of poisoning, age, sex, provenance, fate, period of intoxication, factors that impede the nursing management of poisoning by Ferragat in child. The data collected will respect anonymity and confidentiality and will then be captured and analyzed by Excel 2010 software.

Results and Discussion

1. The frequency of intoxication by Ferragat

During the study period 727 children were received in the pediatric service for intoxication out of a total of 9049 admissions ie a hospital incidence of 8.03%. During these 3 years of study (2013-2015), the incidence of poisoning increased by 54% from 6.8% in 2013 to 10.5% in 2015 (Table 1).

Table 1. Distribution of poisoning frequency among consultations.

years	Total Pediatric Consultations	Number of poisonings All inclusive	Frequency in%
2013	3338	227	6,8%
2014	3079	223	7,2%
2015	2632	277	10,5%

Poisoning by ingestion occupies, after trauma, the second place of the accidents of the domestic life of the child [16]. In Morocco, the poisoning of the child gains a considerable extent, more than 1/3 of poisonings occur before 15 years, and infants are frequently victims [17]. These authors cited that the incidence of poisoning increases with age: it is predictable in 8% of cases before 12 years, 18% of cases in the older child. The products involved are heterogeneous: medicines, household products, plants, pesticides [17].

In Morocco, according to epidemiological studies cited by N. Echahbi, A. Soulaymani and al, children were also the most affected by scorpionic stings and envenomations and ophidian bites in different regions of Morocco [18].

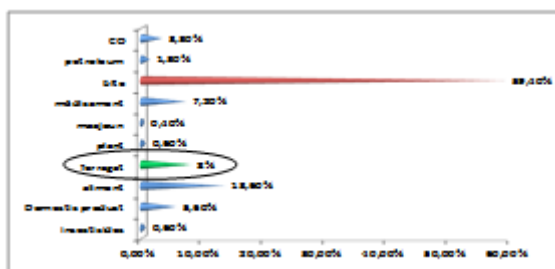


Figure 1. Distribution of poisoning by type of toxicant.

Figure 1 shows that poisoning by pimples and scorpionic envenomation (SSE) lead to 59.40% of cases. Food poisoning (13.60%) is second only to Ferragat poisoning (8%).

The relative frequency of Ferragat poisoning recognizes a slight decrease over the 3 years from 8.84% to 7.22% (Figure 2). According to results reported at the Center anti poison and pharmacovigilance of Morocco CAPM, the region of Marrakech-Tensift-Al Haouz is ranked third place after Grand Casablanca and Tadla-Azilal. Analysis of the data showed that lethality was higher among addicts under the age of 15 (9%) (quoted by Dahbi) [18].

Indeed, according to the epidemiological data established by the Anti-Poison Center and Pharmacovigilance of Morocco (CAPM), the scorpion bite occupies the first place among the various poisonings (30-50%). With an annual incidence rate of 1.2% varying from 0 to 2.60% depending on the region. Each year 4 deaths are reported per 1000 bites, 90% of which are reported in children less than 15 years of age. This is why SSE are placed in first place among all causes of poisoning in Morocco [19]

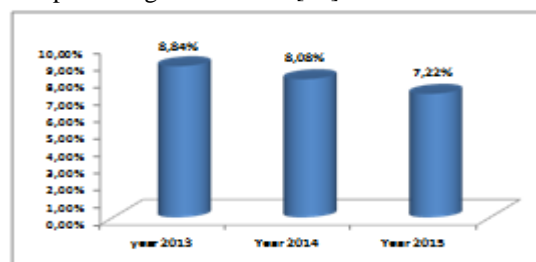


Figure 2. Distribution of Ferragat intoxication by years.

According to Abourrazek [10] in 2012, Ferragats are most often older women considered traditional healers known in Morocco and many in Marrakech. They see their practices as a human gift transmitted from generation to generation (from mother to daughter). The majority of them are illiterate. Results similar to our study were reported by Khattabi and al in 2011-2013, during the year 2013, the use of Ferragat is the third place of intoxication with 2775 cases (9.6%), Children intoxicated by Ferragats [20]. Our result showed a slight decrease in the number of Ferragats. This decrease is the explanation of a great awareness of the parents and a great motivation of the health personnel to inform the parents about the dangers of the PF according to a study realized by the students of Higher Institute of Nursing and Health Professions of Marrakech in 2013, It has been shown that the majority of nurses' state that parents are reluctant (87%) to declare recourse to Ferragat for several reasons, namely lack of ignorance of the declaration procedure [21]

2. Socio-demographic characteristics

The age group 0-4 years was the most affected by PF and the majority observed in children under one year old with (70% -94%) with a male predominance of 72.3% during the 3 years (Table 2). Poisoning by Ferragat originates from the urban environment (55% - 65%) and is observed in the winter and spring periods with 78% (Figure 3)

Table 2. Distribution of demographic characteristics (Age, Sex and Origin).

Variables	2013	2014	2015
Age			
<1 an	70%	94%	90%
1-4 ans	30%	6%	10%
>4 ans	0%	0%	0%
Sex			
Male	70%	77%	70%
Female	30%	23%	30%
Origin			
Urban	55%	61%	65%
Rural	45%	39%	35%

According to (Soulaymani bencheikh, 2012) [5], intoxication is one of the components of accidental pathology linked to sociological and economic specificities, parents can intoxicate their children by making medication errors or inflicting them on therapeutics Which are dangerous. In Marrakech, the use of Ferragat may be due to old beliefs (chem, influenza ...), the low socio-economic level (urban and rural) and the difficulties inherent in access to care that make the population of Marrakech use of these plants for therapeutic uses, especially in children. According to Hafidi 2014 [13], modern medicine in Morocco, sometimes inaccessible by its cost that leaves room for the exercise of herbalists and especially the Ferragat. In Africa, according to a study in Mali, economic accessibility, the short circuit of treatment is a determining factor in a society plagued by poverty to access herbalist woman healer (very low wage, underemployment, unemployment, bad Harvesting ...) [12]

Access to the Ferragats is easy either at home or in the souks and their fees do not exceed 30 Dirhams (3 dollars) including consultation and treatment. Most of their clients are illiterate and poor, from rural or peri-urban backgrounds and without any social security. They consult to treat their newborns and infants, who present different symptoms and pathologies or diseases that only Ferragat knows (chem, serra, etc.). Indeed, in Morocco, some parents from a socio-cultural level believe in sorcery (chem and other) observed especially in the male sex. Africans regardless of their social status, whatever their level of education, remain attached to their tradition and often resort to plant-based care whenever necessary, they are used to cure an imbalance, but also the protection of healthy subjects against enemies, sorcerers, malevolent spirits [12].

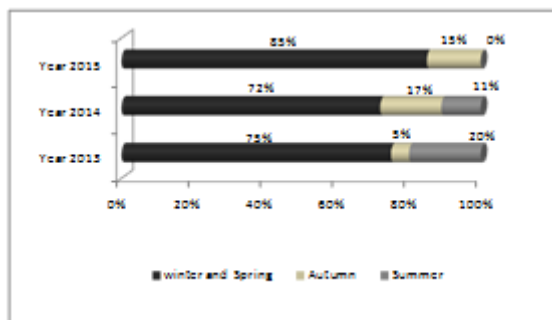


Figure 3. Distribution of poisonings by Ferragat according to seasons.

The use of Ferragat in newborns and children is predominantly observed in children under 4 years of age. The parents of these children believe in the treatments given by these herbalists for example in search of a sleeping effect of the child by *Papaver somniferum* (Kharchacha) [23]. According to studies, the "Ferragat" claim to treat in the newborn and the infants several symptoms and pathologies including digestive, neurological, respiratory disorders, dermatological infections, fever, incessant cries which are rather more observed during the winter seasons and the spring or the respiratory and allergic problems are persistent. As well as our results, among infantile diseases treated by women herbalists are fever, headache, stomach ache, tooth surge, diarrhea, respiratory diseases, Otorhinolaryngitis, conjunctivitis, etc. [24]

The belief in traditional medicine and the dissatisfaction of medical treatment are among the factors determining the use of this type of care [9]. Our study showed, according to a questionnaire sent to the nurses that the use of Ferragat is due a difficulty in the care of sick children and access to care in

health centers. In his study, Malick TRAORE [24] showed that poor facilities and materials for health centers, inadequate personnel (training, absenteeism, etc.), the high cost of benefits and medicines, the length of treatment (consultation, analysis, prescriptions, transportation and travel) are among the causes of access to traditional care.

3. Nursing care of intoxicated children.

Our retrospective study showed that the progression was favorable in 100% of the cases and the length of stay in the hospital varied between 2 days and 7 days depending on the severity. According to the questionnaire sent to the nurses (7 nurses / 8 in total), the results show that the latter encounter difficulties in 73% of the cases to take care of a child poisoned by Ferragat. Indeed, the approach taken for the care of children intoxicated following an act of Ferragat consists solely of the reception of the sick, then the interrogation, looking for the age of the child, sex, provenance, the mode of intoxication and the symptoms presented by the patient. However, information on the quantity administered and the nature of the plant is missing (data missing from the register, which includes information on poisoning among children in the pediatric ward).

According to Ouairdirhi A in 2012 [22], Intoxication is a cosmopolitan problem, the severity of which is related to the delay and quality of care. The progression may be severe or even fatal in the absence of appropriate management. The Poison and Pharmacovigilance Center (CAPM) draws attention to the dangers of this type of treatment provided by Ferragat. These treatments cause severe neurological, digestive, urinary, cardiac and renal complications that have a detrimental effect on the general state of health of the child. Indeed, according to Ouairdirhi [22], the adoption of traditional practices by certain parents for the treatment or prevention of certain diseases is another aspect of Moroccan realities that often prove dangerous. While traditional medicine is being promoted by WHO in different cultures and regions, this organization insists on the need to advance international standards and methods of evaluation in parallel with this medicine. Thus, information, training and regulation see regulation of products and practices prove vital for the preservation of the lives of Moroccan children.

On the other hand, this illegal medicine is observed in the working methods used by the "Ferragat", namely the application of abdominal scarifications, points of fire, the administration of oral mixtures and the application of products on a part of the body of the newborn or of the infant endangering the health of the child as regards the delay in diagnosis and medical management, the infectious and haemorrhagic risk which are related to the products and plants administered [10]. This complexity of identifying the plants involved and the delay of administration prolongs the management of the PF thus the delay of the hospitalization varies between 2 days and 7 days observed by our investigation.

Table 3. Distribution of factors impeding the management of PF.

Factors Affecting Care	Effective %
Difficulties in taking care of	73 %
Lack of Emergency Toxicology Laboratory	100%
Lack of medicines and means	60%
Not consulted at CAPM	80%
Lack of continuing education on nursing management of Ferragat poisoning	100%
Lack of nursing staff	100%
No standard protocol	100%

According to our questionnaire, the difficulty of management was based on the identification of the plant administered and the amount likely to have been ingested. Indeed, a telephone description to the CAPM to allow an accurate identification of the plant [13] as well as analyzes of biological fluids (gastric fluid, blood and urine) within the emergency toxicology laboratory allow a more precise identification of type and quantity administered. Similarly, a precise questioning of the circumstances makes it possible to make an approximate evaluation of this quantity whose reluctance of the parents to speak of the "Ferragat" can lead to a delay in the diagnosis to see misdiagnosis and a complexity of care [10]. Unfortunately, our survey reveals a total absence of a regional laboratory for emergency toxicology and the use of the CAPM to report PF and receive information appears to be made only by a minority (20%) and the statement remains only with the nurse major and the attending physician. On the other hand, non-declaration is due to the lack of ignorance of the declaration procedure and the workload. According to Soulaymani bencheikh and al, 2011 [5], the declaration of all cases of poisoning became obligation, in accordance with Ministerial Circular N°. 19 829 DR / BF / MM of Morocco.

In addition, other findings on the difficulties of nursing care (Table 3) indicate the lack of material resources (60%), the lack of continuing education (100%), the lack of a large number of nurses and lack of a Ferragat poisoning care protocol negatively influence the quality of care for children who are intoxicated by Ferragat. Hafidi and al in 2014 [13] have shown that the lack of training of young doctors and nurses on the risks associated with plant ingestion is another difficulty hindering care and, the organization of the service contribute to the rise of the tension in the hospital services which often irritate the patients and make difficult the conditions of work of the professionals. On the other hand, the shortage of human resources is a constraint on the care of the child [18]. Abourrazek and al [10] have suggested to improve the reception conditions and the care of addicts in the health and health services a necessity: the equipment of the reception infrastructure, the training of the medical personnel and the establishment of regional toxicology laboratories, the systematic call to the CAPM in case of doubt about the nature of the toxicant, its composition, its toxicity and its specific treatments

Conclusion and Recommendations

Poisoning has many causes and can be medicinal, food, industrial, domestic, or by plants. In fact, poisoning by plants remains largely predominant throughout Morocco and is mainly observed in children by resorting to traditional medicine called Ferragat. According to our study, it does not appear to decrease in frequency. The use of plants is far from being negligible, it is practiced irrationally by Ferragat, anarchic and uncontrolled and the population of a low level of education and socioeconomic uses it in very varied and numerous contexts. The products used are often a mixture of plants, of which the knowledge of the types of plants, the dose administered, the method of preparation and consumption are not yet mastered. Indeed, the care of these children constitutes a real health problem, in particular for the health personnel, because they find several difficulties to ensure it. The present study makes it possible to propose some recommendations to improve the management of children intoxicated by Ferragat

➤ Educate parents at the health center about the dangers of using plants and the use of Ferragat (this activity proven by

other researchers reduces serious neurological, digestive, urinary, cardiac and renal complications of intoxicated children [10]).

➤ Train human resources (nurses, doctors, laboratory technicians, etc.) in the management of poisonings according to cycles of continuing education and propose a standard protocol for care

➤ Assigning and managing material resources within the pediatric ward allows each patient to find his or her place in this medical and paramedical care

➤ Close collaboration with Morocco's CAPM (Toxicovigilance Service: information and declaration) and the presence of an emergency toxicology laboratory in Marrakech make it possible to identify the toxicant in question and its dose

➤ To open up research tracks to identify and determine the plants incriminated in this poisoning in collaboration with the analysis centers at the level of the Marrakech region

➤ Sensitizing the population by the media on the risks of intoxication by the Ferragat

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