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RESEARCH ARTICLE

EVALUATION OF THE MANAGEMENT OF SKIN BURNS IN CHILDREN AT THE PEDIATRIC UNIVERSITY HOSPITAL OF BANGUI

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ABSTRACT

Introduction: Burning in a child is a relatively common occurrence in everyday life. The resulting support benefits not only the children but the entire community. The objective of this study is to evaluate the management of burned children in Bangui. **Methodology**: This is a retrospective analytical study carried out at the Department of Surgery of the Pediatric University Hospital Center of Bangui from April 2013 to December 2016. The data were collected from the exploitation sheets and analyzed on the software. Epi-info version 7. **Results:** 216 patients were included. Burns were more prevalent among boys (56.48%) than girls (43.42%). The average age was 6 years old. The patients came from Bangui in 63.88% of cases. 54% of parents were of low socio-economic status. The main place of accident was home (97%) and parents were involved in 65% of cases. The thermal cause was dominant (87.5%) and immersion (65%). Headquarters regions (34.7%) were the most affected. Patients were medically treated (56%) and 4% required secondary skin grafting. The evolution was uncomplicated in 150 patients (66.44%). The average duration of hospitalization was 22 days. 20 deaths (9.25%) were deplored. Traditional treatment and burned skin area greater than 15% appeared to be associated with this lethality rate. **Conclusion**: Improved home monitoring and scalding education are key to reducing burns in children in Bangui.

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INTRODUCTION

Burning is the destruction of the skin or even underlying tissues under the effect of a thermal, chemical or electrical agent or ionizing radiation (Duhamel, 2015; Ibnouzahir *et al*., 2011). It is a pathology that affects the entire population. The child, because of its physiological, cutaneous and developmental characteristics, is more exposed to burn than the adult. This leads to functional, psychic and social deficiencies in the child. The carelessness of young age, combined with ignorance of risk and even family carelessness, expose children to mostly domestic accidents (Aparbhoo, 2010). And the burns of the child seem to be a frequent means of abuse (Latarjet, 2010). Indeed, this pathology seems more observed in our Service. This is how we propose to carry out this study, which apparently has never been done.

The specific objectives were:

- Describe the socio-demographic profile of the patients;
- specify the anatomo-pathological forms encountered;
- Describe the evolution of cases of burns according to the therapeutic protocol;
- Identify the risk factors associated with these skin burns.

PATIENTS AND METHOD

This is a retrospective analytical study covering a period of 4 years and 6 months from April 1, 2013 to December 31, 2016. Our population consisted of children admitted to hospital in the Service during the study period.

Were included:

All children aged 0 to 15 years hospitalized for a skin burn; children who have benefited from an exploitable medical file.

Were not included in our study:

Children over the age of 15; children whose medical records are not exploitable. Various data were collected and analyzed for each subject using the following materials:

An exploitation sheet including: socio-demographic aspects, data concerning the accident, clinical and para-clinical signs, management methods and evolution;

The register of the hospitalization service

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Medical records of patients

A laptop The data was entered and processed using the Microsoft Office Word 2013 software and analyzed with Epi info version 7. We used the chi-square test to compare the proportions at the significance level of 0.05.

RESULTS

The prevalence of burned children was 12.28%. Male sex was the most concerned (56.48%). The average age was 7 years and children in the 0 to 3 age group were more represented (68.98%) followed by 6 to 9 years (14.35%). Children resided in Bangui in 63.88% of cases. Patients with low socio-economic parents accounted for 54%. Domestic accidents were more frequent with 97% of cases. Parents were involved in 65% of burns of their children. The causative agents of burns were dominated by: boiling water in 144 cases or 66.67%, other boiling liquids (soups, tea, coffee, oil, etc.) in 45 cases or 20%, and the flame in 23 cases that is 10%. The mechanisms of burns were represented by the immersions in 65%, followed by projections in 18%. The skin burns occurred during the 24 hours and much more in the afternoons between 6H to 12H and from 13H to 21H.

The months of December, January and July from 2013 to 2016 were the most concerned with a cumulative percentage of 39% (Figure 1). Attitudes of initial management of children burned at the accident site were: traditional treatment in 157 cases or 61.32%, cooling in 54 cases, 21.1% and no treatment in 45 cases, or 17.58%. The methods of access for children burned in the hospital were provided by the parents with the various means of transport in 90,27%. In our series, 212 patients had no pathological history. Associated regions (buttocks, genitals, perineum) were the main lesional seats (34.70%) and followed by lower limbs (29.1%). The majority of children burned had total body area burned (SCTB) between 10% and 25% in 102 cases, or 47.22% and followed by SCTB between 5% and 9% in 75 cases, or 34%. Most burns were 2nd degree (Figure 2) in 112 cases or 51.85% followed by mosaic burns 1st and 2nd degree in 48 cases, 22.22%. The other clinical signs were dominated by fevers in 73% followed by digestive disorders (vomiting, diarrhea, stopping of materials) in 10%. Of the paraclinical examinations carried out, 78 or 40.20% of patients had leukocytosis followed by anemia in 28 or 14.43% of patients.

Medical treatment and resuscitation represented the main therapeutic modalities achieved (96%). In most cases burn wound dressings used Argentinean sulfadiazine antibacterials (94.44%). The most used antibiotics (Table 1) were: amoxicillin (51.04%), ampicillin (16.04%) and cloxacillin (9.70%). Adjuvant treatment with analgesics was used in 66.44% of cases and followed by SAT in 10.52% of cases. The results of the treatments were 69.44% unbound of complications. Some complications were noted: infection 53 cases (24.53%), anemia 9 cases (0.9%), undernutrition 2 cases (0.93%), renal failure 2 cases (0.93%). The average duration of hospitalization was 22 days and maximum 91 days. Of the 216 total burn victims, 20 deaths were reported in hospital, or 9.59%. Of the 20 deaths, 11 or 55% had died from boiling water burns, and 7 or 35% by other boiling liquids (soups, oil, coffee, etc.). Of these deaths, 12 or 60% had died from septic shock and 5 or 30% were by SDMV. The risk of death (Table II) was higher compared to traditional treatment ($p < 0.05$).

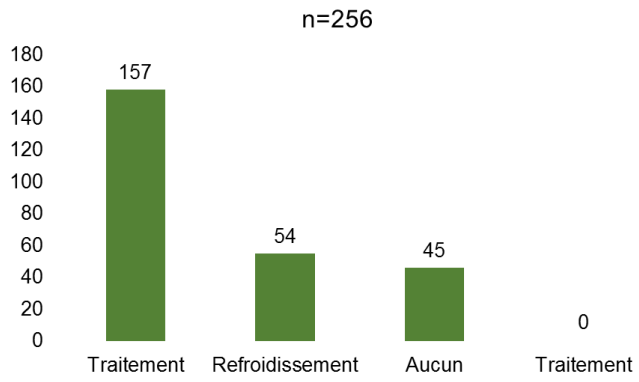

Figure 1. Distribution of burns by month and occurrence of burns

Figure 2. Superficial 2nd degree burn in a 6-month-old infant

Table 1. Representation of antibiotics

Antibiotics	Work force	Percentage
amoxicillin	139	51,04
ampicillin	43	16,04
Amoxiclav	6	2,23
Ceftriaxone	23	8,59
Gentalline	7	2,61
Ciprofloxacin	12	4,48
Floxapen	5	1,87
Cloxacillin	26	9,70
Chloramphénicol	3	1,11
Métronidazole	4	1,50
Total	268	100

Mortality was higher in patients with an infection with no significant difference (Table III).

DISCUSSION

The prevalence of burns in children during the period of our study is similar to that reported by Axelle Dupont (2015). It is an epidemiological parameter that draws our attention to the fact that children's skin burns should be considered a public health problem. Our male predominance joins the data of the literature (Mougui, 2014; Zahid *et al*., 2011). This predominance may be explained by the fact that boys are turbulent and girls are prone to self-preservation. The more active boys act impulsively and play far away from parents as compared to girls. Children aged 0 to 3 years are the most represented in this study. Our result is close to that of Mougui and Hadley (Mougui, 2014; Hadley, 2013).

Table 2. Distribution of patients by socio-demographic factors and deaths

Socio-demographic factors	Death				Total	P value	OR IC (95%)
	Yes		NNo				
	Effective	%	Effective	%			
Sex							
Male	12	9,83	110	90,16	125	0,3630	1,18
Female	8	8,51	86	91,48	94		(0,46 - 3,04)
Age range							
< 5	12	7,31	152	92,68	164	0,0365	2,53
> 5	8	15,38	44	84,61	52		(0,96 - 6,67)
time of admission (hour)							
0 – 1	11	9,48	110	90,51	116	0,4603	1,04
> 1	9	9,00	9	91,00	100		(0,41 - 2,69)
Traditional treatment							
No	2	3,38	58	98,30	59	0,0085	7,51
Yes	18	11,46	139	88,53	157		(0,98 - 57,58)

Table 3. Distribution of patients by clinical factor and death

Factors clinical	Death				Total	P value	OR
	Yes		No				IC (95%)
	Effective	%	Effective	%			
Extended (%)							
≤ 15	2	5,26	159	82,38	161	0,00	84,17 (10,86 -
> 15	18	94,74	37	17,62	55		652,23)
Depth (degree)							
1st	2	15,38	11	84,61	13	0,184	1,58 (0,59 - 4,24)
2e	15	7,61	182	90,36	197	0,080	
3e	3	50,00	3	50,00	6	0,270	3,35 (1,08 - 10,31)
Infection							
Yes	9	16,98	44	83,01	53	0,0128	3,13 (1,19 - 8,18)
No	11	6,74	153	93,86	103		

These authors state that it was a risk age group. This could be explained by the great turbulence coupled with the inexperience of young children and a great imprudence on the part of the entourage, not to mention the imperfect coordination and curiosity. In total, the age of the first steps and first initiatives in a world where the child is not aware of these dangers is a risk factor for accidents in general, including burns. Most of our patients live in Bangui. So, we deduce that the children of the capital are more awake. Our results corroborate those of Mougui and Hamdaoui (2014; Hamdaoui, 2011). The low socio-economic level of our patients is also noted by Bougassa (2008). The French study carried out by Capon-Degardin (2001) reveals that a quarter of patients came from disadvantaged backgrounds where low material resources, low socio-cultural level, precarious hygiene and parental alcoholism are often associated. In our series, more than half of burns occurred between 12H - 21H. Indeed, the afternoon corresponds to hours when the domestic activity intensifies in the household by the preparation of meals and the bath. This result is comparable to that of Messaadi (2004). Burns of children occur much more in the afternoons. This high frequency could be explained by the waking period. Our study shows that the months of December, January and July are the most concerned. In our country, the months of December and January are the periods when it is cold, the burns produced during these periods can be explained by the need for hot water for bathing and housework. The majority of our patients have received traditional toothpaste, powdered sugar, cassava flour, animal fat; in less than a quarter of the cases, nothing is done; cooling in some cases by water. These results indicate a lack of knowledge regarding the importance of first aid measures in the event of an accident, mainly during a burn. Hamdaoui (9) in his series, reported identical proportions.

On the other hand Lo. This water heating is generally done in conditions devoid of any safety measure namely the use of pots and fagots in free places. In addition, parents claim that hot water will destroy some intestinal parasites such as pinworms in the form of eggs that irritate the anus of their children. The burns in the month of July are justified by the presence of children at home during periods of summer holidays. The study conducted by Hemeda (13) in Egypt reveals an increase in the number of hospitalizations in the cold season. However, a study conducted by Stephan G (2000) did not show any notable seasonal variations regarding the admission of burn patients. The servant is the most indexed place. This data is similar to that reported in other series (Duhamel, 2015; Mr, Ibnouzahir, 2011). We can admit that most of the child's burns, outside the context of neglect and violence, occur during a moment of inattention of the busy adult to the acts of everyday life. It seems that parents are not sufficiently aware of the risks of certain situations for their children. Indeed, the warm bath of the child and the preparation of meals are risky moments of accidents, including burns. The responsibility of the parents is engaged in more than half of the burns as underlines Mougui (2014). We can mention that ba K (2014) in his study in Nancy mentioned 52% of patients supported by SAMU / SMUR equipped with telemedicine via smartphones or tablets. This difference reflects the development of new technology in developed countries. In our study, the majority of patients were consulted on the first day and half the first three hours. This delay in admission to hospital could be explained by the minimization of medical treatment resulting in a strong traditional treatment practice. This result is comparable to that reported in Rabat by Zahid (2011). Almost all our patients are brought by parents by various means of public transportation. Ambulances are only used for inter-hospital transfers. This is due to the lack of adequate emergency and pre-hospital care

facilities of the SAMU and SMUR types for burns. This finding is made by Owono (2014) who reported that 79% of the evacuation of burns to the hospital is provided by non-medical vehicles. But Stephan (2000) noted in his study that 52% of burned children are taken to hospital by an ambulance. This difference is explained by the existence of SAMU in developed countries. In our study, 4 patients had an antecedent: 3 epileptics and 1 asthmatic. Out of age, the existence of a pathological terrain is an important aggravating factor of the burn, the preexistence of cardiac and neurological pathologies, kidney failure, immune depression or diabetes is pejorative. Capon-Degardin (2001) found in his study 2 epileptics, 3 diabetics. In our series, the members are the most frequent locations, followed by the associated regions (buttocks, genitals and perineum). This could be explained by the immersion of children in hot water. Messaadi (2004) reports that the most frequent location is the limbs, followed by the face and hands. In our series, the average area of skin burned is 1 / 5th and more than half of patients have a skin area burned between 10% and 40%. This could explain the frequency of scald burn and other boiling liquids. Mougui (6) in their series reports that the average skin area burned is 18.75%. Liqiang (2013) reports in their study that 53.2% of patients have a SCB greater than 20%. Our work regains the predominance of second degree burns. This would be explained by the predominance of boiling liquids. We also find them in several writings (Latarjet, 2010; Mougui, 2014; Zahid *et al*., 2011; Hamdaoui, 2011; Messaadi, 2004; Stephan, ?). Fever is predominant in this work. This sign reflects the disruption of thermal regulation mediators of inflammation during skin burns. In our study, medical indications are the most represented, followed by resuscitation. In some cases, the indication is surgical. This result could be explained by the predominance of 2nd degree skin burn and the burnt skin surface found in our patients. This result corresponds to that of Bougassa (Bougassa, 2008). Rehydration is done according to the Parkland formula. The use of analgesic and antibiotic is systematic. This attitude is similar to that of Amengle (2015) in Cameroon.

In our series of 216 cases, almost ¾ are untied of complications. The majority of complications are infections. This same observation is made by Amengle (2015). Our average length of stay in hospital is very high compared to the literature (Mougui, 2014; Hamdaoui, 2011; Loba, 2014; Owono, 2014). This could be explained by the fact that none of our patients are transferred, but other studies are conducted in the intensive care unit whose main objective is to stabilize the patients and then to send them to the specialized services for additional support. in charge. Despite free healthcare and the availability of recruited staff, the mortality rate related to children's burns is 9.25%. But it is a satisfactory result from the point of view of efficiency. This result is similar to that of Mougui (2014). However, these rates remain very high compared to those observed in the developed country series (2013). This high mortality rate is explained partly by the severity of the cases, care which requires more specialized centers and complications, but also by the lack of information and raising awareness among the general public about the immediate actions to be taken in the event of a home burn and the lack of pre-hospitalized medical care. Traditional treatment is a risk factor related to death. The components of the various products applied to wounds could lead to delays in admissions and infections. This observation is also made by Owono (Owono, 2014). Lethality is high in patients with an infection than those who do not.

These results show that infection can still be criminalized as the leading cause of death for burned children. This reflects the literature (Mougui, 2014; Hamdaoui, 2011; Bougassa, 2008; Owono, 2014).

Conclusion

Skin burns in children remain a major public health problem because of their frequency and mortality. 2nd degree burns are common. Hot water is the main cause of burning. We have identified the role of certain factors such as the absence of UAS in pre-hospital care, the ignorance of parents. An effective prevention plan should be multisectoral and include efforts to combat the risk of burns in children.

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