



## Article Original

## Pediatric Traumatic Lesions in a District Hospital of Benin and Determinants of the Attendance of Children at the Follow up Visits

*Profil des lésions traumatiques pédiatriques dans un hôpital de district au Bénin et déterminants de la présence des enfants aux visites de contrôle des trois premiers mois*

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## RÉSUMÉ

**Objectifs.** Décrire le profil des lésions traumatiques chez les enfants admis aux urgences hospitalières pour traumatisme et les facteurs qui influencent leur présence aux visites subséquentes de contrôles des premiers, deuxième et troisième mois au Bénin. **Méthodologies.** Il s'agit d'une étude prospective, longitudinale, descriptive et analytique d'une durée de 10 mois (Novembre 2014 à août 2015) effectuée dans un hôpital de district du Bénin. Les critères d'inclusion étaient : âge inférieur ou égal à 15 ans, consultation au service des urgences pour un traumatisme suffisamment sévère pour justifier une hospitalisation ou une mise en observation. La présence de l'enfant aux visites de contrôle a été évaluée au premier, deuxième et troisième mois et les raisons de l'absence ont été étudiées. **Résultats.** 41 enfants ont été recrutés. Leur âge moyen était de 8 ans. Le sex ratio garçon/fille était de 1.6. environ 2/3 des enfants venaient de la commune de Kandi. La distribution des lésions était la suivante : trauma crânio-cérébral (12 cas ; 29.30%), fractures des membres ou du rachis (9 cas ; 22%), brûlures (5 cas ; 12.2%) et polytraumatisme (3 cas ; 7.30%). Le séjour hospitalier moyen était de 2.81 jours. La présence des enfants à la première visite a été faible (<50%) et elle était liée avant tout au lieu de résidence des parents et à la gravité des lésions initiales. Au 2ème et 3ème contrôle, la fréquentation a continué de chuter. Malgré tout, le pronostic a été globalement favorable, les séquelles n'ayant été constatées que chez un enfant avec fracture du rachis. **Conclusion.** Au Bénin, les principaux déterminants de la présence des enfants victimes de traumatisme aux visites de contrôles est la distance par rapport au centre de soins et la gravité des lésions initiales.

## ABSTRACT

**Objective.** To describe the factors affecting the attendance of children consulting for physical trauma at the follow-up visits in Benin. **Methods.** This was a prospective, longitudinal, descriptive and analytical study conducted over a 10-month period starting from the 1st of November 2014 to the 31st of August 2015. Criteria of inclusion were age below 15 years, consultation at the emergency department for physical trauma severe enough to justify hospitalization or in patient observation. The presence of the child at the monthly monitoring visits was evaluated for three months and the reasons for absence were studied. **Results.** 41 children were recruited. The mean age was 8 years. Sex ratio male/female was 1.6. Children came mainly from the commune of Kandi (68.3). Distribution of lesion was head injury (12 cases; 29.30%), spine or limb fractures (9 cases; 22%), burns (5 cases; 12.2%) and polytrauma (3 cases; 7.30%). The average hospital stay was 2.81 days. Presence of children at the first follow up visit was generally low (<50%) and it was strongly related to the residence of the parents and the severity of the initial lesion. The presence of children dropped significantly at the 2nd and 3rd controls. Nevertheless, the outcome was good for most patients. **Conclusion:** in Benin, the presence of children consulting for trauma at follow up visits is related mainly to the distance from the hospital, but also to the severity of the initial lesions.

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## INTRODUCTION

Trauma is a public health issue in the world, because it is in cause in 9% of the world mortality and it is also a cause of severe disabilities [1]. In Africa, child trauma is definitively a problem, but its importance is sometimes overshadowed by the burden of infectious diseases [2]. The aim of our study was to assess the epidemiologic, diagnostic and therapeutic aspects of child trauma in daily surgical practice while considering the factors influencing the attendance of children at the follow-up visits, once released from the hospital.

## METHODS

This study was carried out in the emergency department and in the surgical wards in the district hospital of Kandi (Benin), the first level of reference of this health district. This consists of three municipalities: the first municipality (C1) where the hospital is located, the second one (C2) situated further to the south and the third one (C3) situated more to the east. Three other municipalities of the zone, alphabetically called C4, C5 and C6 were included. We carried out a prospective longitudinal descriptive and analytic study in the hospital over a period of 10 months

starting from 1 November 2014 to 31 August 2015. The patients included were those below 15 years of age, admitted at the emergency department of the hospital for physical trauma and for whom the clinical state was sufficiently severe to justify hospitalization or in-patient close observation, regardless of the fact that this may be accepted or not by the parents. The variables studied were age, sex, origin, initial lesions and the evolution at the control visits. These follow up visits were done at month one, two and three.

## RESULTS

### Epidemiologic aspects

During the study period, we recruited 41 children and 25 boys and 16 girls (sex-ratio= 1.56). The average age was 8 years (range: 6 months and 15 years). The age distribution was as follows: eight children (19.5%) aged five or less years, 23 children (56.1%) aged 5 to 10 years and 10 children (24.4%) aged 11 10 years or more. Only 11 children (26.8%) were attending school classes. Other children were ox breeders (9.8%), farmers (9.8%) or craftsman (2.4%). 21 children (51.2%) were just at home, without attending school or having specific job. Patients came mainly from commune C1 (68.3%). A non-negligible fraction also came from commune C2, C3 and C6. The other communes were less represented (table 1).

**Table I : Distribution of patients by their origin**

Health zone		Number	%
		Commune 1	28
Other communes	Commune 2	3	7,30
	Commune 3	4	9,80
	Commune 4	1	2,40
	Commune 5	1	2,40
	Commune 6	4	9,80
	<b>Total</b>		41

The circumstances of trauma were dominated by falls from height of a tree and road traffic accidents (RTA) as seen in table II. Among the 12 RTA recorded, nine were motorbike-pedestrians.

**Table II: Distribution according to the nature of the trauma**

	Number	%
<b>Falls from the top of a tree</b>	16	39.00
<b>Accident on public roads</b>	12	29.30
<b>Burns</b>	5	12.20
<b>Games</b>	4	9.80
<b>Aggression by animals</b>	3	7.30
<b>Fights (wound by weapon)</b>	1	2.40
<b>Total</b>	41	100,00

### Diagnostic aspects

For 30 children (73.2%), the delay of admission to the emergency department was less than 6 hours. This delay was between six and 24 hours for seven children, (17.1%). It was above 24 hours for four children (9.7%). Distribution of traumatic lesions was as follows: head injury (12 cases; 29.30%), fractures (9 cases; 22%), burns (5 cases; 12.2%) and polytrauma (3 cases; 7.30%).

### Management aspects

Eighteen children (43.9%) were kept under close observation for less than 24 hours, 20 (48.7%) were hospitalized for a period of one to 3 days, one child was referred toward the division health center and the treatment was refused by the parents of the last two.

Different modalities of treatment (medical, orthopedic and surgical) were used. All children took analgesic drugs and two third of them received antibiotics, anti-inflammatory drugs and hydro-electrolytic fluids. Corticosteroids, cerebral oxygenators, tetanus serum, resuscitation and blood transfusion were administered as appropriate.

The evolution was favorable for 32 cases (84.2%), but six children (15.8%) had complications. No death was recorded. The mean hospitalization duration was that of 2.81 days.

### Attendance at the control visits

The attendance at the outpatient control visits is summarized in table III.).

**Table°III: Distribution of children according to their attendance at the monthly follow up visits and their clinical outcome**

		1 <sup>st</sup>		2 <sup>nd</sup>		3 <sup>rd</sup>	
		U	F	U	F	U	F
<b>Age (years)</b>	< 5	0	1	0	1	0	2
	[5,10[	1	10	1	8	1	6
	≥ 10	0	5	0	2	0	2
<b>Sex</b>	Male	1	3	1	5	1	5
	Female	0	13	0	6	0	5
<b>Origin</b>	Commune 1	1	11	1	8	1	8
	Commune 2	0	1	0	1	0	1
	Commune 3	0	1	0	0	0	0
	Commune 4	0	1	0	0	0	0
	Commune 5	0	2	0	2	0	1
	Commune 6	0	0	0	0	0	0
<b>Lesions</b>	Burns	0	0	0	0	0	1
	Abdominal contusion	0	1	0	1	0	0
	Thoracic contusion	0	1	0	0	0	0
	Fracture	0	0	0	3	0	7
	Dislocation	0	1	0	1	0	1
	Abdominal open wound	0	1	0	1	0	0
	Soft part	0	1	0	0	0	0
	Thoracic wound	0	2	0	1	0	0
	Polytraumatism	0	0	0	0	0	1
	Brain injury	0	9	0	4	0	0
	Cranio-facial trauma	0	0	0	0	0	0
Spinal trauma	1	0	1	0	1	0	

U = unfavorable outcome; F = favorable outcome

This table shows that less than a half of these children (48.6%) attended to the post-operative follow up visits. The presence of children in the first control visits, which was low from the beginning, was also strongly related to the residence of the patients and to the severity of the initial lesion. The attendance at the second and third control visits dropped significantly. The presence of children at these visits was also linked to the proximity to their dwelling place but also to the severity of their initial lesions. The evolution was good for all the patients except one boy with spinal injury who had neurologic sequelae.

## DISCUSSION

Over a period of 10 months, 41 children with trauma were registered in our study. The average age of eight years is close to the age reported in the series of Ouattara et al. (8 years and 27 days), Mouafo Tambo et al. (8 years and a half) and Abdou Raouf et al. (9 years) [3,4,5]. This is because, at this age, children have not yet reached complete maturation in their physical and cognitive state. Curiosity that characterizes this period and their perpetual thirst for experiences supersedes their ability to grasp the risks and may then lead to dangerous reactions [1,3]. Age was different at other studies. For example, Mbika Cardorelle found an average age of 3 years and 6 months [6], probably because they also included non-surgical trauma like intoxication, which is frequent among less than 2 years old children [1]. The average age found by Bahebeck et al. was 9 years and 6 months, and that was because these authors included children until the age of 18 years [2].

In our study, only 26.8% of children were attending school classes. This is different from the results of Mouafo Tambo et al. in Yaoundé, who had 88% of schoolchildren among the patients of his series. This is because our health area is characterized by agropastoral life style and it is Islamic with a net school rate of 55.05% in 2006-2007 [7] while Yaoundé, the capital of Cameroon had a school attendance of 89.6% in 2008-2009 [8].

In our study and in most series, boys were more affected than girls [1, 2, 3, 4, 5]. It is known that boys are generally

more active than girls are. They participate more in violent moves than girls do. Some authors like Mbika Cardorelle et al. [6], had a female dominance (52.7%). That is because these authors included intoxications, especially suicide attempt that are more frequent among females.

The commonest etiologies of the trauma, in our work were the falls from the top of a tree (39%) and the RTA (29.3%). The findings of Kaboro et al. [9] were different: first RAT and then injuries due to games, sports injuries, burns and falls. This tendency will probably stay because urbanism is rising in African countries and poor driving conditions will probably lead to a rise in RTA. It is notable that children involved in RTA were mostly pedestrians (75%) in our study: The findings of Ouattara and al. [3] were similar with a pedestrian level of 80.9%.

In our study, evolution was uneventful for all the children except one case of sequelae with neurological spinal involvement. Nevertheless, attendance at the follow visits was generally poor, and there were a high number of children who were lost to follow up. The poor attendance of children to follow-up visits is an obstacle to good monitoring and control of the healing of lesions. This poor compliance to follow-up appointments was largely due to the distance from the residence to the hospital, which induced costs that were prohibitive for some parents whose revenue was low.

## CONCLUSION

Our study has showed that the leading causes of trauma were falls from a height and RTA. Attendance of children to follow up visits is generally poor. Taking into consideration the severity of neurologic sequelae of certain trauma such as head injury or spine injury, education of the population is mandatory. This education should stress the importance of proper trauma care and the role of neurologic expertise in the initial and subsequent management of the children with trauma to reduce the complications and possible sequel. It should also emphasize the importance of the strict respect of monthly follow up appointments for improved quality in the management of children with trauma.

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