

Original Research Article**Management of Patients with Severe Head Injuries in Low-Income Country**Chaibou M. S^{1*}, Gagara M¹, Daddy H¹, Issa Souleymane B¹, Alfred-Dogbe Y. Z¹, Sanoussi Nanzir M¹, Sani R¹, Sanoussi S²¹Department of Anaesthesiology and Intensive Care, Niamey National Hospital, G472+5F2, Niamey, Niger²Department of Surgery, Niamey National Hospital, G472+5F2, Niamey, Niger**Article History**

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Abstract: **Background:** Head injuries constitute a real public health problem in Low Income Countries. The aim of this study is to evaluate the management of severe head trauma. **Patients and methods:** A prospective study was conducted for a period of six months, from 1st February to 31th July 2018 at Niamey National Hospital. Were been Included all patients victims of head injury with Glasgow Coma Scale (GCS) less than 8. The following variables were studied: age, sex, cause of trauma, deadline admission, means of transport used, Glasgow Coma Scale, CT Scan results, management and evolution. **Results:** Out of 1,918 patients admitted; 243 were head trauma, of which 76 patients had a GCS less than 8 (3.96%). Male predominance was found with a sex ratio of 24.33, young people was the most concerned (mean age: 29.88 ± 16.37 years). Predominant age group was 16 to 30 years old, with 43.42% of patients. The circumstances of the trauma were road traffic accidents (86.84%). Transportation was medicalized in 15%. GCS was between 6 to 8 in 74.02% and the admission deadline was less than 6 hours in 77.63%. Respiratory distress was found in 28.95% and circulatory distress in 14.47%. Cranio-cerebral CT scan was performed in 82.89%. Seven patients (9.21%) were intubated and ventilated. Death rate was 53.94%. **Conclusion:** Head injury concerns a young male patient, the cause was a road traffic accident, this situation could be improved by raising the population's awareness of road safety and greater efficiency in taking in medical charge.

Keywords: Severe head injury, Management, Niamey National Hospital.

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INTRODUCTION

Head injuries are a public health problem throughout the world because of the development of the vehicle fleet, this is particularly accentuated in Low Income Countries where the non-compliance with road traffic rules is compounded by inadequate medical resources, both in pre-hospital and intra-hospital, thus making this condition more deadly. Head trauma is considered serious in any patient who has a Glasgow Coma Scale (GCS) of ≤ 8. Head injury is a major cause of death and disability in young adults. Niger, a country with limited resources, continues to face this problem, hence the interest of this study. The aim is to evaluate the management of severe head injury in Niamey National Hospital [1-4].

PATIENTS AND METHODS

A prospective study was conducted for a period of six months, from 1st February to 31th July 2018 at Niamey National Hospital. Where been

Included all patients victims of head injury with Glasgow Coma Scale (GCS) less than 8. The following variables were studied: age, sex, cause of trauma, deadline admission, means of transport used, Glasgow Coma Scale, CT scan results, management and evolution. Data were analyzed with Epi Info 6™ (Centers for Disease Control and Prevention, Atlanta, GA). Statistical test, used is Khi2 for the comparison of variables. Test was significant if p <0.05.

RESULTS

For this study 1,918 patients admitted to the emergency unit, 243 presented head trauma and 76 of them had severe head injury (3.96%). The male sex represented 96.05% with sex ratio of 24.33. The mean age of the patients was 29.88 ± 16.37 with ranges of 2 years and 73 years. The 16 to 30 years group represented 43.42% of patients, those under 15; 17.11%. Patients over 65 years are 7.89%. (Figure 1) Farmers represented 26.32% and schoolboys 18.42%. Road traffic accidents were the main cause in 86.84%

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and falls in 7.89% of cases. Among the patients; 77.63% were admitted to the emergency room between 30 minutes and 6 hours after the trauma. The Glasgow Coma Scale at admission was between 5 and 6 in 50% of cases. (Figure 2)Pupil examination was normal in 63.89% of patients, anisocoria was found in 22.22%. Epistaxis was present in 28.95% of patients and otorrhagia in 26.32%. Low blood pressure was found in 9.21% and high blood pressure in 5.26% of cases. Respiratory distress was found in 28.95% of patients and circulatory distress in 14.47%. The patients had chest trauma and abdominal trauma, associated in 6.58% and 1.32% of cases, respectively. The brain CT scan performance rate was 82.89%. Isolated cerebral contusion was found in 46.43%, extra dural hematoma in 9.21% of patients. The CT scan was normal in 14.29%. (Table 1) The hemoglobin level was less than

7 g / dl in 13.6% of the patients and thrombocytopenia was found in 7.89% of the patients. Among our patients, 6.57% had renal failure and 15.79% had a disturbed serum electrolytes. Hypoglycemia was found in 3.95% and hyperglycemia in 3.94%. Seven patients (9.21%) were intubated and ventilated. Blood transfusion was performed in four patients (5.26%). Surgical management was evacuation of extradural hematoma in 9.21% of patients. The mean hospital stay was 8.74 days with extremes of 30 minutes and 44 days. Forty-one patient had died during hospitalization; or a mortality of 53.94%.There is a significant relation between the admission delay and the evolution ($\chi^2 = 3.9322$ and P-Value = 0.000), between the Glasgow Coma Scale and evolution ($\chi^2 = 25.149$ and P-Value = 0.001).

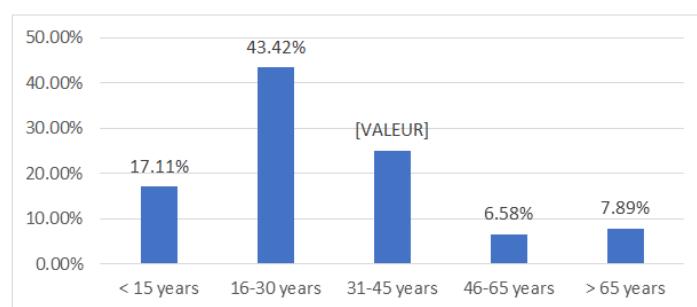


Figure 1: Distribution of patients by age

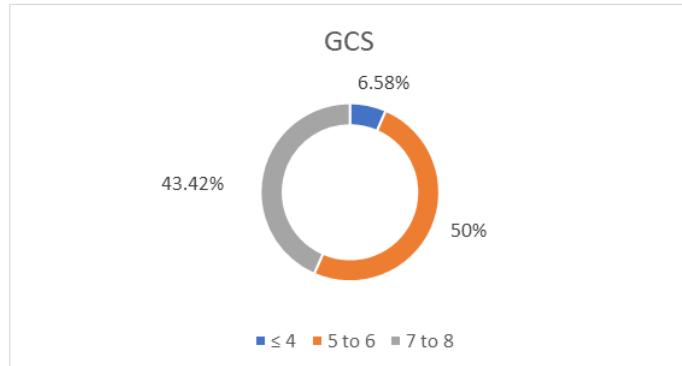


Figure 2: Distribution of patients by Glasgow Coma Scale (GCS)

Table 1: CT Scan meningoencephalics lesions

Lesions	Number	Percentage %
Contusion	26	46.43
Oedema	18	32.14
Intraparenchymalhematoma	9	16.07
Subarachnoidhemorrhage	5	8.93
Subduralhematoma	3	5.36
pneumencephaly	3	5.36
None	8	14.29

DISCUSSION

During the period of our study, of the 1,918 patients admitted to the Emergency unit, 243 presented with head trauma (12.66%) of them 76 were severe

head injury (3.96%). Daddy H et al., in 2013 had found 21.09% of head injuries and 6.90% of severe and Chaibou, M. S et al., found in children 33.94% of head trauma [5, 6]. In relation to all head injuries, severe cases accounted for 31.27%. Lower than the results of

Sanoussi S et al., in 2007 at the Niamey National Hospital, which had recovered 37.9%. This drop in the rate of head trauma can be explained by the wearing of helmets and seat belts made compulsory in Niger since 2017 [7, 8].

A strong male predominance with 73 men (96.05%) against 3 women (3.95%) with sex ratio of 24.33. This predominance was reported by several authors: Rabiou M. S et al., in Niger, Sanou J et al., in Burkina Faso; Aguémón A. R et al., in Benin reported 90.2%, 86.8% and 85.6% respectively [9-11]. This predominance could be explained by the socio-cultural realities of our community where men move more frequently, especially on motorcycles. Severe head trauma affects a young population, our results were comparable to those of Daddy H et al., & Aguémón, A. R et al., [5, 11]. In our series, the framers represented 26.32% and the schoolboys 18.42%, in Parakou (Benin Republic) Akodjénou L et al., had a predominance of workers and schoolboys respectively 44.2% and 17.3%. Chaibou MS finds that schoolboys were the first victims of road traffic trauma in Niamey city, the high proportion of farmers in our series is linked to the fact that the latter increasingly use motorbikes for their movement Road traffic accidents were the main cause of severe head injuries in 86.84% of cases [6, 12]. These results were the same of Sanou J et al., in Burkina Faso, with 63%. This is due to an increase in means of transport (vehicles, motorbikes) in recent years increasing the frequency of traumatic pathologies [6, 10]. In this serie, 77.63% of patients were admitted before the first six hours. This is explained by the fact that the majority of patients came from Niamey city. Indeed, the rapid management of head trauma reduces brain lesions and improves the prognosis [5, 6, 13]. Glasgow Coma Scale was between 6 and 8 at admission of patients in 74.02%, these results are slightly lower than those found by Edouard et al., who had found 91.01% and higher than those of Bouhours G et al., with 35.29% [14, 15].

In our series we had 9.21% of hypotension. These results are comparable to those of Tentiller E et al., who had found 8% but lower than those of Stocchetti et al., and Bouhours G et al., who found 25% and 36% respectively [15-17]. Respiratory distress was encountered in 28.95% of cases, our results are comparable with those of Bouhours G et al. who had found 29% but higher than those of Tentillier, E et al., with 12% of cases. This could be explained by the inadequacy of prehospital management (release and protection of the upper airways) in our context [15, 16]. The crano-cerebral CT scan was performed in 82.89% of our patients; the remaining 17.11% were mostly dead within the first few minutes. This was made possible thanks to the establishment of a social care system at the hospital level which allows CT to be performed in any serious head trauma, even in the poor, in accordance with the recommendations of the brain scan

in the severe head trauma [13]. In our series, 9.21% of our patients were intubated, ventilated and sedated. These results were far from the objectives setting the systematic indication for intubation in all head trauma patients with a GCS of less than 8. This low rate of performing orotracheal intubation could be explained by the lack of beds in the intensive care unit of the Niamey National Hospital, making intubation very selective. The mortality was 50.94%, this rate is comparable to the study conducted in Île de France by Van Haverbeke, et al., (47.9%), but better than the results of Panczykowsky, D. M et al., in the USA (41%). On the other hand, this rate is lower than the results of Sanoussi S et al., in 2007 in Niger and Aguémón, A. R et al., in Benin with respectively 90.14% and 70% of deaths [7, 11, 18, 19].

CONCLUSION

Severe head injury is a public health problem in our country despite the measures taken by the authorities, the situation remains worrying. Improving this situation involves strengthening the pre-hospital service but also by equipping our hospital structures with human and technical resources for adequate care.

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