

Original Research Article

Management of Chest Trauma in Intensive Care Unit (ICU) in Niger

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Abstract: *Aim of the study:* To describe the management of patients with chest trauma in the ICU of National Hospital of Niamey (HNN). *Patients and Method:* It was a retrospective descriptive analytical study carried out from February 1st, 2017 to February 28th, 2021, ie 4years. Were included in the study, all the patients with chest trauma admitted in the ICU of National Hospital of Niamey. The studied variables included: age, gender, medical history, the circumstances of occurrence, the mechanism involved, transport, time to admission, type of the trauma, associated lesions, clinical signs, complementary signs, medical care of the patient, surgical care of the patient, evolution and length of stay in hospital. The collected data were entered and analyzed with the following software : EPI Info v3.5.4, Office 2019. *Results:* During the time of our study we have registered 34 patients over 982 patients who were hospitalized ; ie a frequency of 3.46%. We've noted a male predominance with 73.52% (n=25) ; ie a sex ratio of 2.77. The average age of our patients was 32.14 years with extremes ranging from 1 to 70 years. The age group of 31 to 45 years was the most affected with 64.70% (n=22). Twenty six (26) patients, ie 76.5% had no medical history, 5 had hypertension, 2 were diabetics and 1 was a chronic smoker. The etiologies were dominated by road accidents with 61.76% (n=21) followed up by ballistic trauma with 17.64% (n=6). We noted close chest trauma in 76.47% (n=26) of the cases and open chest trauma in 23.53% (n=8) of the cases. The patients benefited from medical transport (SAMU) in 35.29% (n=12) of cases. The average time to admission was 3.8 hours. Hemothorax was the most frequent lesion with 26.47% (n=9), followed up by pneumothorax with 20.58% (n=7) and ribs fracture with 17.64% (n=6). The most frequent associated lesions were limbs fracture with 26.47% (n=9), abdominal trauma with 23.52% (n=8) and head trauma with 20.58% (n=7). Fifty percent (50%) of our patients had lesions that were immediately life threatening, an evaluation and first aid treatment were immediately necessary in those patients. In our study, 32.35% (n=11) of our patients had presented life threatening injuries with high risk of mortality. Thoracic drainage was efficient in 61.76% (n=21) of the patients and thoracotomy was indicated in 5.88 (n=2) of cases. All our patients benefited from a complementary medical care. The complications were dominated by hémorragique shock. The mortality was of 29.41% (n=10). *Conclusion:* Chest trauma remains frequent and represents as well a common cause for consultation, with an important frequency in active young people especially in male gender. A proper emergency pre hospital care, a medical transport towards a center with technical equipment are essential an crucial in optimizing chance of survival and remission.

Keywords: Chest trauma, ICU, HNN, Niger.

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INTRODUCTION

Chest trauma is a frequent reason for consultation in emergencies and ICU. The severity of the trauma is however difficult to estimate, depending on the clinical condition of the patient, clinical tolerance and associated lesions. The main issue of the management of those patients is the patient's initial assessment. Thoracic

injuries are responsible of more than 25% cases of death, which represent the second cause of mortality in polytrauma after head trauma [1, 3]. Moreover, thoracic trauma are rarely diagnosed in first plan because they are associated in 80% of cases with life threatening lesions [4, 5]. The aim of our work was to describe the management of patients with chest trauma in ICU.

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PATIENTS AND METHODS

It was retrospective descriptive and analytical study carried out from February 1st, 2017 to January 31st, 2021, ie a duaration of 4 years. Were included in the study, all the patients with severe chest trauma admitted in the ICU of National Hospital of Niamey. The variables studied were : age, gender, medical history, circumstances of occurrence, the involved mecanism, transport, time to admission, type of the trauma, associated injuries, clinical signs, paraclinical signs, medical care, surgical care, evolution and length of the hospitalization. The data were collected and processed with the following software : EPI Info v3.5.4, Office 2019.

RESULTS

Thirty four (34) patients were collected with a male predominance in 73.52% (n=25) of cases, ie a sex ratio of 2.77. The average age was 32.14 years with extremes ranging from 1 to 70 years. The age group of 30 to 45 years was the most affected in 64.70% (n=22). Twenty six (26); ie 76.5% (n=26) had no medical history, 2 were diabetics and 1 was a chronical smoker. The circumstances of the trauma were dominated by road traffic accidents in 61.76% of cases (n=21), followed up by ballistic trauma in 17.64% of cases (n=6). The Figure 1 shows the differents circumstances of thoracic trauma.

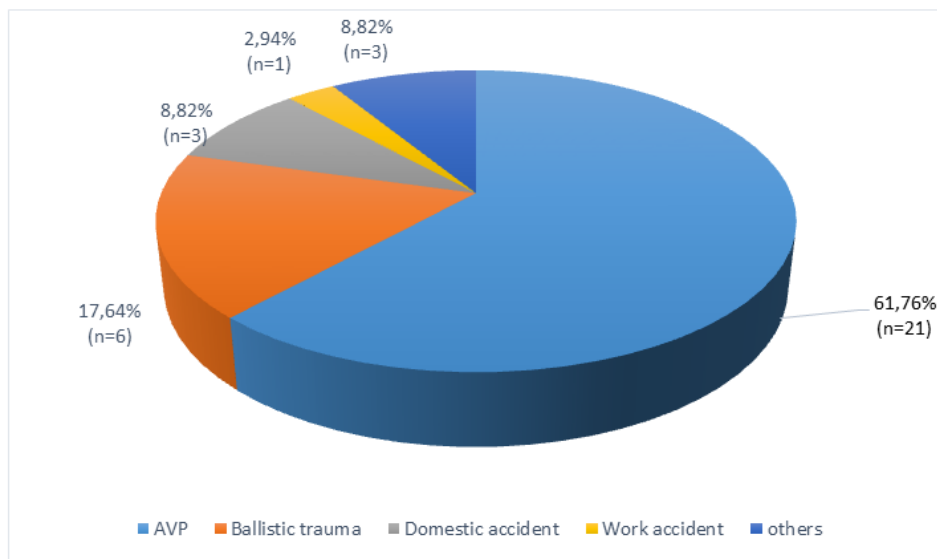


Figure 1: Distribution of the patients according to the circumstances of the trauma

It was close chest trauma in 76.47% (n=26) of cases and open chest trauma in 23.53% of cases (n=8). As we can see on Figure 2, the patients benefited from

medical transport by SAMU in 35.29% of cases (n=12). The time to admission was 3.8 hours.

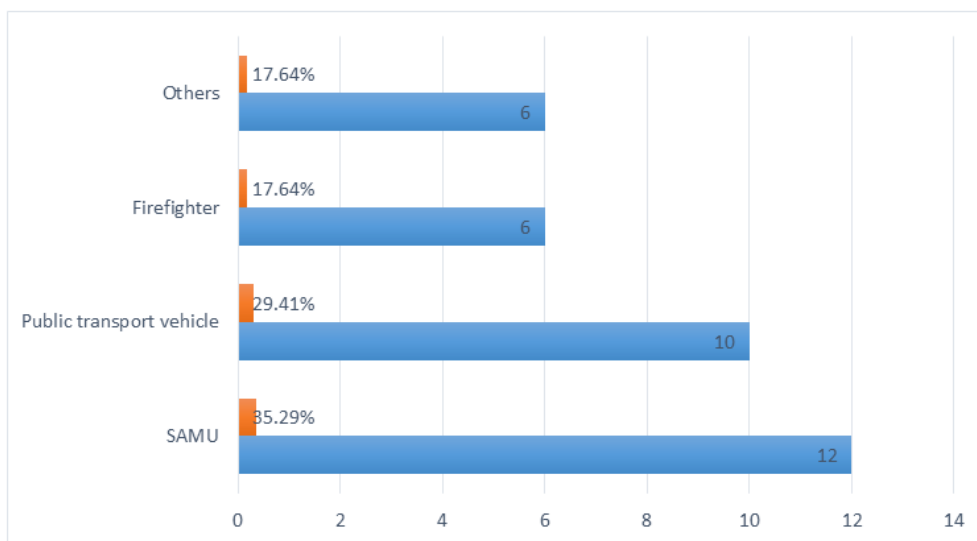


Figure 2: Distribution of patients according to the mode of transport

Hemothorax was the most frequent lesion in 26.47% of cases (n=9), followed up by pneumothorax in 20.58% of cases (n=7), ribs fracture in 17.64% of cases (n=6). The Table I resume the differents diagnosis of the

injuries. The common associated injuries were limbs fractures in 26.47% of cases (n=9), abdominal trauma in 23.52% of cases (n=8) and head trauma in 20.58% of cases (n=7).

Table I: Distribution of the patients according to the thoracic lesions found on x-ray

Lesions	Thoracic x-ray
Pulmonary contusion	9
Hemothorax	9
Pneumothorax	7
Hemopneumothorax	6
Ribs fracture	6
Clavicle fracture	1

Among our patients, 50% (n=17) presented life threatening lesions requiring an evaluation and a treatment during the primary survey (Table II).

Table II: Distribution according to lethal six

Lethal six (precoce mortality)	yes	No
Massive hemothorax	8	26
Compressive pneumothorax	6	28
Flail	2	32
Open pneumothorax	1	33
Airways obstruction	0	34
Tamponade	0	34

In our study, 32.35% (n=11) of the patients presented life threatening and potentially fatal lesions (Table III). Thoracic drainage was sufficient in 61.76 of

cases (n=21) and thoracotomy was indicated in 5.88% of cases (n=5). All our patients benefited from a supplementary medical care (Table IV).

Table III: Distribution according to hidden six

Hidden six (Late mortality)	Yes	No
Pulmonary contusion	9	25
Diaphragmatic rupture	2	32
Tracheo bronchial rupture	0	34
Myocardial contusion	0	34
Oesophagial rupture	0	34
Large blood vessels lesions	0	34

The complications were dominated by haemorrhagic shock. The mortality was of 21.41% (n=10).

Table IV: Distribution according to the management

Management	Effective	Percentage (%)
Fluid challenge	34	100
Analgesia	32	94,11
Oxygenotherapy	26	76,47
Transfusion	17	50
Vaso active drugs	4	11,76
Intubation	4	11,76
Thoracic drainage	21	61,76
Thoracotomy	2	5,88

After an analytical study, it comes out that there is a statistically significant link between the circumstance of occurrence and the clinical evolution of

the patients (P=0.004). In fact, patients involved in road accidents have a high risk of mortality compared to other circumstances of the trauma (Table V).

Table V: Distribution according to the circumstance and evolution

Circumstances of occurrence	Evolution		Total
	Favorable	Decease	
Road accidents	13	10	23
Ballistic trauma	4	0	4
Domestic accident	2	0	2
Work accident	1	0	1
Others	4	0	4
Total	24	10	34

DISCUSSION

In our serie, 34 patients had been collected over 982 patients admitted in the hospital, ie a prevalence of 3.46%. Our patients had an average age of 32.14 years with extremes ranging from 1 year to 70 years ; in comparison with other series, Khalil E and col. in Morocco in 2021, Niang EHM and col. in Senegal in 2017, Hama Y and col. in Niger in 2017, had found respectively an average age of 35.07 ; 34.9 ; 35.65 [5-7]. Those results can be explained by the fact that this group of age is the most active and mobile using means of transport related with high risk of accidents. The majority of our patients were transported to the hospital with different types of means of transport: personal cars, taxis, non medicalised ambulances, only 35.29% of our patients benefited from medical transport by SAMU. Our result is similar to that found by Niang EHM and col. with 34% of medical transport ; but superior to that of Hama Y and col. with 18.7% [2, 7].

We reported close chest trauma in 76.47% of cases. The same predominance had been reported by many authors such as Niang EHM and col. Hama Y and col with respectively 79% and 69.2%. Khalil and col. had found 45% [2, 5, 7]. Road accidents represented 61.76% of the etiologies in our study, followed up by ballistic trauma (17.64%). Our results are superior to those found by Niang EHM and col. , Khalil E and col. and James D and col. who had reported respectively 56.3%, 49.5%, 26% and 9.4% [2, 5, 8]. Thoracic x-ray had been realised in all our patients. Thoracic x-ray is systematic during the management of patients with thoracic trauma in National Hospital of Niamey, then comes CT-Scan which had been realised in 52.94% of our patients, and finally ultrasound which had been realised in only 6% of our patients. In our study, 61.67% of the patients had benefited from thoracic drainage and 5.88% underwent surgery. The evolution was marked by the occurrence of complications in 26.47% of cases, with 2 cases (5.88%) of haemorrhagic shock and 1 case (2.92%) of cardiogenic shock. The mortality was of 29.41% (n=10). The average length of hospitalization was of 12.2 days. Niang EHM and col., had found 13.3 days and 26.5 days in the serie of Hama Y and col. [2, 9, 12].

CONCLUSION

Thoracic trauma remains a common pathology and a recurring reason for consultation with a high frequency in active young male population. Most of the

time the trauma occurs as a result of road accident or armed aggression and is responsible of a high morbidity mortality especially if they are associated with others extra thoracic lesions. An adequate pre hospital management, a medical transport towards a center with adequate technical equipment is essential and important for an optimization of surviving and remission chance.

Conflict of Interest: None

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