

Epidemiological and evolutionary profile of polytrauma patients admitted to the intensive care unit of the UMC of the Mostaganem University Hospital

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ABSTRACT:

Background: Prognosis is limited by the severity of the injuries and their pathophysiological consequences on vital functions. **Objective:** To describe the epidemiological and evolutionary profile of severe polytrauma patients hospitalized in the intensive care unit of the Mostaganem University Hospital in Algeria. **Patients and methods:** This is a cross-sectional study with a descriptive and analytical aim, with prospective data collection in the emergency and intensive care units over a period of 6 months. Admitted to the intensive care unit of the UMC of the Mostaganem University Hospital from September 1, 2023 to March 30, 2024, 20 patients with multiple trauma were selected. **Results and discussion:** The average age is 36 years, with a male predominance of 85%. Accidents occurring on public roads represented the main cause (40%), followed by falls. Medical transport was provided for only 25% of patients. Respiratory distress dominated the clinical picture upon admission (60%), with impaired consciousness observed in 85% of patients. 70% of patients with multiple trauma had cranio-cerebral injuries, or the average GCS was 7.025. The average length of stay in the UMC intensive care unit was 7.25 days. It averaged 8.33 days for survivors and 6.36 days for non-survivors. We recorded 9 deaths, representing an overall mortality rate of 55%. The predictive factors for mortality were age, the presence of collapse, respiratory distress syndrome, GCS less than 8, the presence of anisocoria, pulmonary contusion with rib fractures, the presence of edema brain herniation and contusion on CT, and a combination of more than two lesions. Assisted ventilation in 60% of cases from the first 24 hours and vasopressor drugs in 10 cases or 50%, blood transfusion was necessary in 40%. 11 patients (55%) required urgent surgery. **Conclusion:** Improving the prognosis of polytrauma victims is based on urgent and effective care at the scene of the accident, hence the need for genuine pre-hospital medicine, and on Care in centers with all the necessary and experienced technical equipment to handle this difficult task.

Keywords: Trauma emergency-Polytrauma victims-Vital distress

INTRODUCTION:

A polytrauma patient is someone with multiple injuries, at least one of which is life-threatening in the short or medium term. This is a patient whose clinical condition and the pathophysiological consequences of their injuries require well-defined care provided by a multidisciplinary medical team and specialized, trained paramedical staff(1). The management of severe polytrauma in intensive care is a complex process and requires rapid and accurate assessment of all injuries(1). Mortality in polytrauma patients increases with age; 50% of deaths occur at the scene of the accident or during transport, 30% in the first few hours, and 20% in the weeks that follow. The majority of studies published on the subject have been conducted in the United States, with specific details on patient epidemiology and

care(2). In Algeria, a better understanding of these patients, the mechanisms behind the accident, and the methods of care could improve our medical practices and advance preventive measures. This study was conducted with the aim of improving our knowledge of polytrauma patients. In this study, our goal was to analyze the clinical, paraclinical, therapeutic, and evolutionary profiles of severely polytrauma patients admitted to the intensive care unit of the Mostaganem University Hospital Center.

Patients and Methodology:

This is a prospective, descriptive study based on observations of polytrauma patients admitted to the medical-surgical emergency intensive care unit at the Mostaganem University Hospital Center between

September 1, 2023, and March 30, 2024.

The objectives were to describe the population of polytrauma patients hospitalized in the intensive care unit of the UMC and its evolution over time, to analyze the care of these patients, particularly in relation to their mortality. To obtain reliable epidemiological data on severe trauma patients in order to guide improvement measures. To optimize their care and detect at an earlier stage those at risk of traumatic injury.

The inclusion criteria were all adult and pediatric patients presenting with at least two injuries upon admission to the intensive care unit, one of which was life-threatening.

Exclusion criteria were all trauma patients who arrived dead at the emergency department or during transfer to intensive care, or incomplete records.

Data collection: we used a data sheet designed to specify the epidemiological, clinical, biological, and therapeutic aspects of each patient admitted for severe multiple trauma.

This data concerns age, gender, origin, mechanism, collection conditions, and circumstances. The data was collected, anonymized, and compiled in a database using Excel© software.

- The time taken for admission to the intensive care unit and treatment; Hemodynamic status;

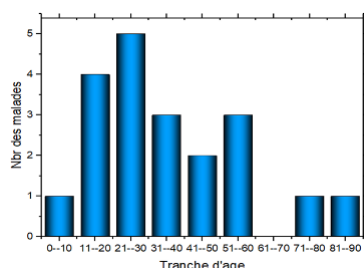


Fig. 01: Distribution of patients by age group

20% of polytrauma patients were under the influence of alcohol at the time of the accident, 25% survived and 75% died, 15% were victims of workplace accidents, and 5% were secondary to a suicide attempt. These were falls.

The peak frequency of multiple trauma cases occurred during the summer, with 10 cases hospitalized in September and October (25% each), 6 cases in November and December (15% each), and finally 4 cases in January and February (10% each). The average stay in the intensive care unit of the UMC is 7.25 days. It was 8.33 days on average for survivors and 6.36 days for non-survivors (Fig. 04). A Glasgow Coma Scale (GCS) score of less than 8 defines severe head trauma. A GCS between 8 and 12 defines moderate head trauma. A GCS greater than 12 defines minor head trauma (Fig. 03). Respiratory distress is common on admission (60%). (Fig. 04) No statistically significant differences

Respiratory status; Neurological status; Radiological data; Biological data; Therapeutic data (vascular filling, transfusion, vasoactive amines, Artificial ventilation. Sedation and analgesia; Severity scores (GCS, Injury Severity Score (ISS), and Trauma Related Injury Severity Score (TRISS)); Progressive data concerned length of hospital stay, complications, survival, or death.

- Static analysis:

The data were entered and coded in Excel 2016. An overall description of the population was provided (average age, distribution by gender, origin). The variable of interest was mortality.

- Bivariate analyses were performed to explain mortality based on different variables (clinical data, paraclinical data, severity scores, radiological and therapeutic data).

RESULTS:

Twenty patients were admitted to the intensive care unit during the study period between September 1, 2023, and March 30, 2024. The average age of patients was 36 years. The average age of survivors (23.33 years) was lower than that of non-survivors (46.36 years) (Fig. 01), of whom 85% were men and 15% were women. The sex ratio was 6:1 (Fig. 02).

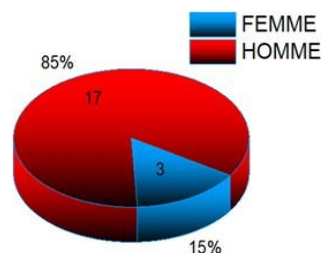


fig 02: Distribution of patients by gender

were noted in the hemodynamic profiles of patients upon admission (Fig. 05).80% of polytrauma patients had associated head trauma, with 2 cases (10%) of HED, 2 cases of HSD (10%), and cerebral edema in 11 cases (55%)., 5 cases (25%) of cerebral contusion, 6 cases (30%) of meningitis, 1 case (5%) of pneumocele, 7 cases (35%) of PCC, 2 cases (10%) of embossing, and 5 cases (25%) of skull fractures (Fig. 06).

Mechanism	Medians of GCS
MOTORCYCLE ACCIDENT	5.25
TRAFFIC ACCIDENT	9.5
FALL	9.375
ASSAULT AND INTENTIONAL INJURY	8
UNKNOWN	3

Figure 03: Distribution of patients according to GCS based on mechanism

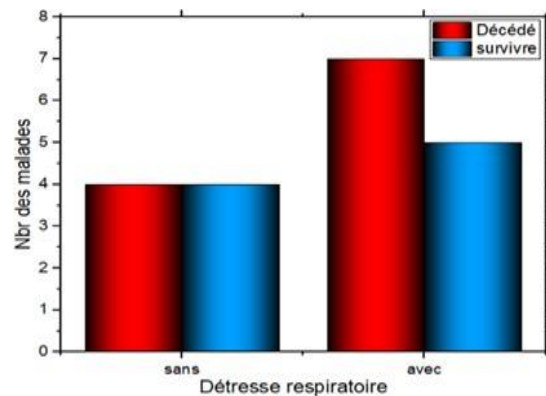


fig 04: Distribution of patients according to hemodynamic parameters

	death	Survivor
PAS	120	120,66
PAD	60,72	70,11
FC	94,9	93,55

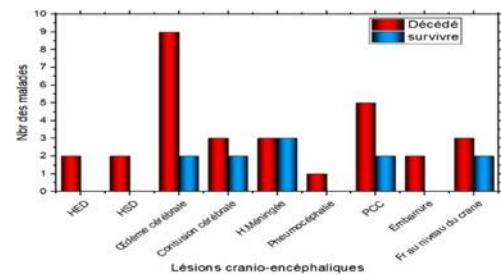


Fig. 05: Distribution of patients according to hemodynamic

Fig. 06: Distribution of patients according to cranioencephalic injuries

The Artificial ventilation was used in 60% of patients, of whom 30% survived and 70% died (Fig. 07). Blood transfusions were necessary in 8 patients (40%) with a survival rate of 1/3. Vasoactive drugs were necessary in 10 patients (50%), generally after fluid replacement failed in cases of hemorrhage: 80% of cases (8 patients) who received vasoactive amines died (Fig. 08).

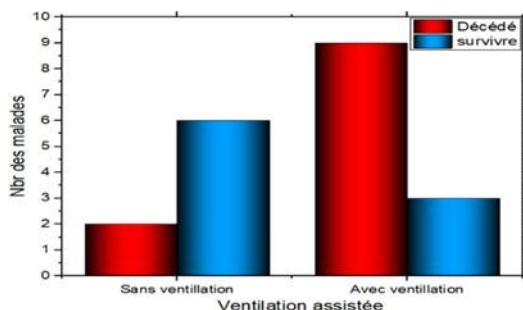


Fig. 07: Distribution of patients according to the need for assisted ventilation

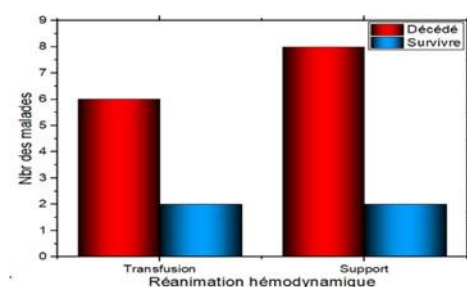


fig 08: Distribution of patients according to the need for hemodynamic resuscitation

11 patients (55%) required urgent surgery, including 10% neurosurgery, 5% abdominal surgery, and 5% maxillofacial surgery. 10% underwent trauma surgery and 5 patients (25%) underwent thoracic surgery (Fig. 09).

Nine patients had a favorable outcome (45%), returning home either directly after leaving intensive care or after a stay in a surgical ward.

- Of the 20 polytrauma patients, we recorded 11 deaths, representing an overall mortality rate of 55% (Fig. 10).
- Of the 11 patients who died: two patients succumbed to shock (18%), two patients had a low neurological score of less than 5/15 (18%), three others died from nosocomial infection (27%), and four patients died from undetermined causes (37%) (Fig. 11).

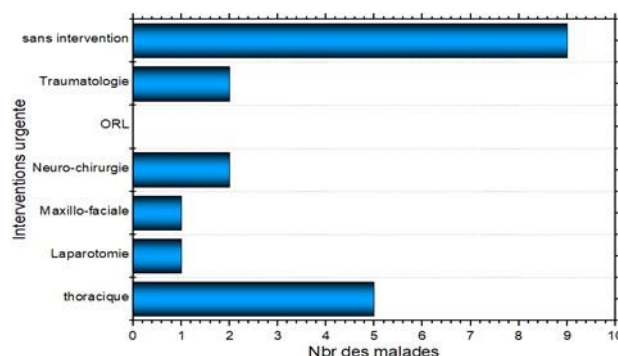


Fig. 09: Number of emergency interventions

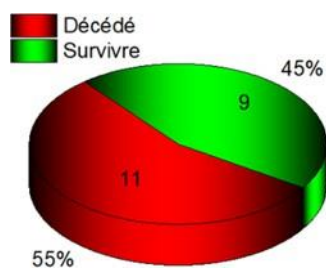


Fig. 10 Distribution of multiple trauma

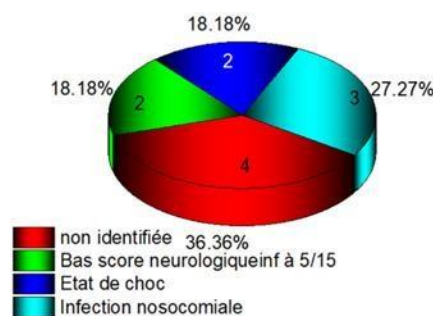


Fig. 11: Distribution by cause of death

DISCUSSION:

This is a prospective, descriptive study based on observations of polytrauma patients admitted to the medical-surgical emergency intensive care unit at the Mostaganem University Hospital Center between September 1, 2023, and March 10, 2024. The average age was 36 years [4-85 years], reflecting a society in which the male population is more active. Compared with the study conducted in Benin (4), the average age of patients was 28.5+ or -12.1 years, and a study conducted in Marrakech where 64.44% of the population studied was between 15 and 45 years old(3). A male predominance was reported, consistent with the Marrakech study, with 68.88% men and 31.11% women. This is explained by the prevalence of risky activities among men(3). Falls were the most common cause of trauma (40%). The second most common cause was traffic accidents (30%), followed by motorcycle accidents (20%) (without helmet). Traffic accidents are the most prevalent cause, similar to the Marrakech study, with a rate of 80%. A wide variability in the circumstances of trauma is noted in different epidemiological studies depending on the sociological, economic, and demographic characteristics of the

populations(3). Twenty percent of polytrauma patients were intoxicated at the time of the accident, consistent with the Marrakech study(3) (4).

In our series, the average length of stay is 7.25 days; it averages 8.33 days for survivors and 6.36 days for non-survivors. In the Marrakech study, the average time between the onset of trauma and direct admission to the intensive care unit is 6.26 hours. It averages 6.92 hours for survivors and 5.06 hours for non-survivors.

Clinically and paraclinically: The average GCS is 7.025 and constitutes a risk factor in our study. The GCS is the valid international standard for assessing and monitoring changes in neurological status. It must be assessed before any sedation, and its estimation is decisive in choosing the therapeutic approach(3) (5).

The FIRST (French Intensive Care Recorded in Severe Trauma) study, which involved 14 French university hospitals, found an average GCS of 12, while the study conducted in Marrakech found a GCS of 11. In our series, neurological distress below 8/15 dominated the clinical picture in 85% of cases(6).

In our series, a GCS <8 with the presence of anisocoria and mydriasis increased the risk of death in our patients. Among the polytrauma patients, 70% had associated

head trauma, with 10% HED, 10% HSD, 55% cerebral edema, 25% cerebral contusion, 30% subdural hematoma, 5% pneumocele, 35% PCC, 10% skull fracture, and 25% skull fracture. During their hospitalization, some patients experienced complications secondary to trauma, therapeutic measures, or prolonged hospitalization. Nosocomial infections represent the main complication during hospitalization in intensive care, with a rate of 20% of nosocomial pneumonia, which is the leading post-traumatic complication in our study, similar to the FIRST study. (6). They are promoted by invasive procedures (tracheal intubation, bladder catheterization, venous catheterization). The ISS allows the severity of injuries to be assessed on a scale of 1 to 75. It cannot predict whether a patient's prognosis will be favorable or not, but it does allow each individual to be placed in a group with a known mortality rate. This prognostic index requires treatment to be tailored to the severity of the injuries(6) (15) (16). This parameter is important in the analysis of polytrauma patients. The higher the ISS, the more life-threatening the condition.

Trauma Related Injury Severity Score (TRISS): Currently, this remains the most widely used and effective method. The TRISS method formed the basis of the Major Trauma Outcome Study (MTOS), which included more than 200,000 patients from 150 North American hospitals. TRISS is based on age, the nature of the trauma (closed versus penetrating), the Revised Trauma Score (RTS) (which includes systolic blood pressure, Glasgow score, and respiratory rate), and anatomical injuries assessed by the Injury Severity Score (ISS) (6) (11). (16). Out of 20 polytrauma patients, we recorded 11 deaths, representing an overall mortality rate of 55%. Deaths may be due to secondary worsening of traumatic injuries (head trauma or hemorrhagic shock) or to iatrogenic or infectious complications. The leading cause of mortality in our study was nosocomial pneumonia (27%); most patients died from undetermined causes (37%).

According to DELAGE, infection is the leading cause of late death in severely traumatized patients. TOMZINE reports that 50% of late deaths in his series were mainly due to nosocomial infection (6) (7) (8).

The Marrakech study, involving 45 polytrauma patients, recorded 7 deaths, representing an overall mortality rate of 15.55%. A low neurological score (27%) and undetermined causes (28%) were the main causes of death in our series (3).

Limitations of this study:

The strength of this study is the method used, which was a prospective and descriptive collection of data. Its weakness is the limitation of the study period to six months. It is therefore a short period with a limited number of patients.

CONCLUSION:

The management of polytrauma patients in Algeria is a major public health issue, marked by high mortality (up to 50%) mainly linked to road accidents involving young people. It requires a structured organization ("trauma center") and rapid multidisciplinary care from the prehospital stage, which is still too often not medicalized.

The main objective of this prospective, descriptive study, conducted over a six-month period in the emergency department of the Mostaganem University Hospital, was to analyze the epidemiological and clinical profiles of polytrauma patients admitted to the intensive care unit and to determine the factors contributing to the severity of their injuries.

The management of severe polytrauma in the intensive care unit is a complex and multidisciplinary process that requires specialized medical expertise to ensure rapid and complete recovery of the patient and reduce the potentially fatal consequences of severe polytrauma.

REFERENCES:

1. Multiple trauma Pathophysiology, Diagnosis, Treatment guidelines. Joint Residency Course July 2019 Topic 59: Multiple trauma. Validation No.: 0759201916
2. CEMIR. Chapter 40 Multiple trauma. College of Intensive Care and Resuscitation Teachers
3. M. Elmustapha ECHCHEHIBA. Management of a polytrauma patient in the surgical intensive care unit at Avicenne Military Hospital. CADI AYYAD UNIVERSITY FACULTY OF MEDICINE AND PHARMACY MARRAKECH Year 2015.
4. A.R. Aguemon a, J.L. Padonou b, S.R. Yévègnon a, P.C. Hounkpè a, S. Madougou b, A.K. Djagnikpo a, D. Atchadé Severe head injuries in intensive care in Benin from 1998 to 2002 Intensive care management of patients with severe head trauma in Benin from 1998 to 2002
5. E. TENTILLIER, S. COMTE DE LUZY, F. REYDY. Prehospital management of severe head trauma. Nursing Congress. State-certified nurse anesthetists © 2015 Sfar.
6. J.-M. Yeguiayan • D. Garrigue • C. Binquet • C. Jacquot • J. Duranteau • C. Martin • F. Rayeh • B. Riou • C. Bonithon-Kopp • M. Freys; Current care of patients with severe trauma in France: initial findings from the FIRST (French Intensive Care Recorded in Severe Trauma) study; February 10, 2012.
7. FIORENTINO. Chapter 103: Head trauma: severity, monitoring, and advice. Emergency 2013 SFMU co-founders.

8. DR DIOP Thierno Madane Maître – Assistant in Anesthesia and Intensive Care FMOS. POLYTRAUMA 2020.
9. P. BARON 1, T. RICHARD 1, Y. CROGUENNEC 1, N. CHAHIR 2, D. L'AZOU 3. Chapter 85
10. Emergency management of upper limb trauma. Role of the nurse. EMERGENCIES 2008 SFMU co- founders.
11. Y. ROUICHI .Chapter 86 Lower limb trauma. EMERGENCIES 2008 SFMU co-founders. .
12. R. Jouffroy, O. Langeron, B. Riou, B. Vivien. Hospital management of severely traumatized adults during the first 24 hours. EMC - Anesthesia and Intensive Care 1 Volume 12 > No. 4 > October 2015 [http://dx.doi.org/10.1016/S0246-0289\(15\)59045-2](http://dx.doi.org/10.1016/S0246-0289(15)59045-2) © 2015 Elsevier Masson SAS. 36-725-C-50
13. Olivier Fourcade Thomas Geeraerts Vincent Minville Kamran Samii livier Fourcade. Chapter 105 – Multiple trauma Mathieu RAUX and Bruno RIOU .Treatise on Anesthesia and Intensive Care 4th edition.
14. Ms. Najlae OUAMNA .Predictive factors for visceral injuries in closed abdominal trauma. Thesis No. 114; Year 2019: Faculty of Medicine and Pharmacy – Marrakech University CADI AYYAD.
15. Sonia Jocelyne E. DOUAMBA. Maxillofacial trauma in adults (epidemiological, clinical, and therapeutic aspects). O UNIVERSITY OF OUAGADOUGOU FACULTY OF HEALTH SCIENCES (F S S) 1998.
16. . 15. AH-450 DT9138 (rev. 2004-12) INITIAL ASSESSMENT OF POLYTRAUMA PATIENTS. USER FILE.
17. Kévin OLRÉY. Epidemiology of polytrauma patients hospitalized in intensive care.