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Hypovolemic Shock of Non-Traumatic Origin in the Emergency Department of the National Hospital Donka: Epidemiological, Clinical, and Therapeutic Aspects

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Abstract

Introduction: The objective of this study was to analyze the epidemiological, clinical, and therapeutic aspects of hypovolemic shock of non-traumatic origin in the emergency department of Donka University Hospital in Conakry. **Methods:** This was a descriptive cross-sectional study conducted over a 6-month period, from September 1, 2025, to February 28, 2026. We included all patients admitted for non-traumatic hypovolemic shock (defined as all patients with fluid or blood loss, without inflammatory syndrome, without a portal of entry, and without signs of heart failure or allergen exposure presenting with arterial hypotension, a thready or imperceptible pulse, and a CRT greater than 3 seconds), regardless of sex or origin, with an age ≥ 17 years, who agreed to participate in the study. We excluded from our study patients with incomplete records, mixed shock states, or transfers prior to evaluation. Recruitment was exhaustive, encompassing all cases of hypovolemic shock. The analysis was performed using SPSS software version 21. Data collection was done anonymously, and confidentiality was respected with the free and informed consent of the responsible persons. **Results:** During this study, we examined 160 cases of shock, including 85 cases of hypovolemic shock, representing a prevalence of 53.23%. Females were predominant (65.9%), with a female-to-male ratio of 0.52. In our series, the mean age was 42.7 years ± 13.4 years, ranging from 17 to 85 years. The 27 - 36 age group was the largest, representing 20% of patients. The reasons for admission were primarily altered general condition (73%), vomiting (48.5%), and diarrhea (37.6%). In our series, cold extremities were observed

in 62.3% of patients, capillary refill time was prolonged in 36.5% of cases, and pallor was observed in 29.4% of patients. The main diagnoses retained were acute gastroenteritis (25%), diabetic decompensation (22.2%), and gastrointestinal bleeding (19%). **Conclusion:** Non-traumatic hypovolemic shock is a common emergency requiring rapid and appropriate management, primarily based on fluid resuscitation. The practitioner's mastery of diagnostic and therapeutic methods is essential for improving the prognosis.

Keywords

Hypovolemic Shock, Emergency Department, Donka University Hospital

1. Introduction

Shock reflects an imbalance between the body's energy needs and tissue supply. In other words, it is the cardiovascular system's inability to maintain normal tissue perfusion [1]. Hypovolemic shock is a circulatory failure due to massive blood or fluid loss, characterized by tissue hypoperfusion and cellular hypoxia [2]. Clinically, it manifests as tachycardia, hypotension, tachypnea, pallor with cold extremities, cold sweats, intense thirst, oliguria, and altered mental status reflecting hypoperfusion [3]. It is a potentially fatal condition. Early recognition and appropriate management are essential [4]. In patients with non-hemorrhagic hypovolemic shock, fluid resuscitation should be initiated at a rate of 30 ml/kg of body weight, administered rapidly to restore tissue perfusion [5]. Hypovolemic shock is the second most serious emergency encountered in the emergency department. Inadequate management of hypovolemic shock has negative consequences, namely organ failure and death [6]. Globally, hypovolemic shock is a major cause of morbidity and mortality in emergency and intensive care units. In the United States, the incidence of shock in emergency departments ranged from 4 to 10 cases per 1000 admissions, with an overall mortality rate of approximately 50% [7]. In Asia, particularly in China, the frequency of hypovolemic shock was estimated at 0.16%, with a mortality rate of 15.5% [8]. In Africa, particularly in Tunisia, in 2012, Bahloul *et al.* [9] reported that hypovolemic shock accounted for 35.2% of cases in the intensive care unit of Habib Bourguiba University Hospital. In Guinea, in 2019, Diallo *et al.* [10] reported that hypovolemic shock accounted for 2.14% of cases in the emergency department of Donka University Hospital. The high frequency and morbidity/mortality of shock and the need for improved management of this condition in Guinea motivated the selection of this study.

2. Methodology

It was a cross-sectional study conducted over a 6-month period, from September 1, 2025, to February 28, 2026. We included all patients admitted for non-traumatic hypovolemic shock (defined as all patients with fluid or blood loss, without signs

of heart failure or allergen exposure, presenting with arterial hypotension, a thready or imperceptible pulse, and a heart rate transient time (HRT) greater than 3 seconds), regardless of sex or origin, with an age ≥ 17 years, who agreed to participate in the study. We excluded from our study patients with incomplete medical records, mixed shock states, or those transferred before evaluation. Recruitment was exhaustive, encompassing all cases of hypovolemic shock. Data were collected through the hospital's information system (triage forms and medical records), picked by an investigative team approved by the lead investigator. Clinical care is initiated immediately upon diagnosis by establishing two large-bore intravenous lines, administering 1.5 liters of solution (crystalloid, colloid, gelofusine, or gelatin), transfusion, or drug administration, followed by a series of assessments of systolic blood pressure, diastolic blood pressure, pulse, capillary refill time, and level of consciousness. Analysis was performed using SPSS version 21. Data collection was conducted anonymously, and confidentiality was maintained with the free and informed consent of the responsible parties.

3. Result

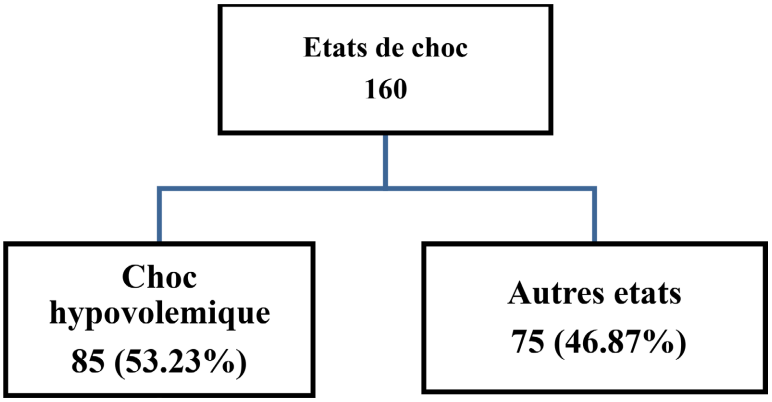


Figure 1. Flow diagram of patients presenting with shock and treated in the emergency department during the study period.

The frequency of hypovolemic shock was not negligible, with 85 cases (53.23%) (**Figure 1**).

Table 1. Distribution of patients by age group.

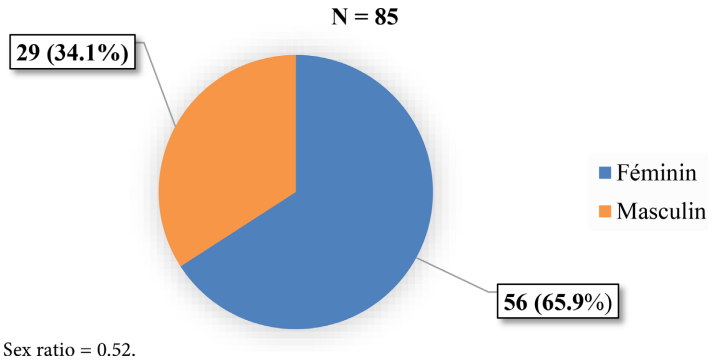
Age Range	Number of Employees (N = 85)	%
17 - 26 years old	12	14.2
27 - 36 years old	17	20
37 - 46 years old	16	18.8
47 - 56 years old	15	17.6
57 - 66 years old	11	12.9

Continued

67 - 76 years old	9	10.6
≥ 77 years	5	5.9

Average: 42.7 years ± 13.4 years. Extremes: 17 years old and 85 years old.

In our series, the 27 - 36 age group was the majority, representing 20%. The average age was 42.7 years ± 13.4 years, with extremes ranging from 17 to 85 years (Table 1).



Sex ratio = 0.52.

Figure 2. Distribution of patients by sex.

Females were predominant at 66%, with a sex ratio of 0.44 (Figure 2).

Table 2. Distribution of patients according to comorbidities.

Comorbidities	Effective	%
HTA	37	43.5
Diabetes	26	30.6
Hepatitis B	16	18.8
Asthma	5	5.9
Kidney Failure	7	8.2
Stroke	3	3.5
Sickle Cell Disease	2	2.3
Heart Disease	2	2.3
HIV/AIDS	1	1.1

In our series, the dominant comorbidities were arterial hypertension (43.5%) and diabetes (30.6%) (Table 2).

Table 3. Distribution of patients according to reasons for admission.

Reasons for Admission	Effective	%
Alteration of General Condition	62	73
Vomiting	41	48.5

Continued

Diarrhea	32	37.6
Fever	15	17.6
Polyuria	16	18.2
Hematemesis	7	8.2
Melena	9	10.6
Loss of Consciousness	10	11.7

The reasons for admission were dominated by altered general condition (73%), vomiting (48.5%), and diarrhea (37.6%) (Table 3).

Table 4. Distribution of patients according to signs of organ hypoperfusion.

Skin Signs	Effective	Percentage
Cooling of the Extremities	53	62.3
TRC	31	36.5
Pallor	25	29.4
Skin Fold	17	20.0
Cold Sweats	12	14.1
Skin Mottling	2	2.3

In our series, cold extremities were observed in 62.3% of patients, capillary refill time was prolonged in 36.5% of cases, and pallor was observed in 29.4% of patients (Table 4).

Table 5. Distribution of patients according to blood pressure.

Blood Pressure	Number of Employees (N = 85)	Percentage
Hypotension	80	94.1
Impregnable	5	5.9

We noted that 80 cases, or 94.1% of patients, had hypotension, and blood pressure was unrestricted in 5.9% of them (Table 5).

Table 6. Distribution of patients according to the Glasgow Coma Scale.

Glasgow Category	Number of Employees (n = 85)	%
≤8	6	7
9 - 12	8	9.4
13 - 15	71	83.5

The Glasgow Coma Scale score was between 13 and 15 in 83.5% of patients, while 7% had a score of 8 or lower (Table 6).

Table 7. Distribution of patients according to hemoglobin levels.

THB Category	Number of Employees (n = 85)	%
<7 g/dl	14	16.6
7 - 12 g/dl	29	34
>12 g/dl	42	49.4

The majority of patients had a hemoglobin level within the normal range, at 49.4% (Table 7).

Table 8. Distribution of patients according to diagnosis.

Diagnosis	Number of Employees (n = 85)	%
Gastroenteritis	21	25
Diabetes Decompensation	19	22.2
Gastrointestinal Bleeding	16	19
Intestinal Obstruction	9	10.6
Malaria (Vomiting)	7	8.2
Peritonitis (3rd Sector)	8	9.4
Metrorrhagia	5	5.9

In our series, the main diagnoses retained were acute gastroenteritis (25%), diabetic decompensation (22.2%), and gastrointestinal bleeding (19%) (Table 8).

Table 9. Distribution of patients according to conditioning.

Packaging	Effective	Percentage
VVP (Peripheral Venous Access)	85	100.0
VVC (Central Venous Access)	3	3.5
Nasogastric Tube	23	27
Urinary Catheter	67	78.8
Transfusion	14	16.5

All our patients benefited from VVP (100%), compared to 3.5% with central venous access (CVC) (Table 9).

Table 10. Distribution of patients according to the type of solution.

Type of Solution	Number of Employees (n = 85)	%
Ringer's Lactate	8	9.4
Isotonic Saline Solution	60	70.6
Ringer's Solution + Saline Solution	9	10.6
Gelofusine + Salt Serum	8	9.4

In our study, saline solution was the most used solution in 70.6%, ahead of Ringer's alone or in combination, and Gelofusine alone or in combination (Table 10).

Table 11. Distribution of patients according to outcomes.

Patient Outcome	Number of Employees (n = 85)	%
Improvement/Transferred	77	90.6
Death	7	8.2
Discharge (Against Medical Advice)	1	1.2

In our series, 90.6% of patients were transferred after stabilization. The mortality rate observed in the emergency department was 8.2% (Table 11).

4. Discussion

During this study, we encountered a high frequency of hypovolemic shock, at 53.23%. This prevalence is higher than that found in 2020 by Matsanga *et al.* [11]. In the emergency department of the Owendo University Hospital, post-traumatic hemorrhagic shock represented 10.28%. These results could be explained, as emergency departments are the entry point for all serious illnesses. The female sex was predominant in 65.9% of cases, with a sex ratio of 0.52, contrasting with numerous series of emergency shock cases. Djibril [12] *et al.* in Togo found a male predominance of 57.9%, with a sex ratio of 1.4. In our series, the mean age was 42.7 years ± 13.4 years, with a range from 17 to 85 years. The 27 - 36 age group was the largest, representing 20%. Djamel Alachaher [13], in the emergency department of the Oran University Hospital, found a mean age of 65.13 years ± 17.83 years, with a range from 17 to 106 years. In our series, the predominant comorbidities were hypertension (43.5%) and diabetes (30.6%). Bahloul *et al.* [9] also found hypertension to be the main predisposing factor. The reasons for admission were dominated by altered general condition (73%), vomiting (48.5%), and diarrhea (37.6%). This triad is perfectly consistent with the etiologies found. It aligns with the literature on severe dehydration and hyperglycemic crises, where asthenia, digestive disorders, and a decline in general condition are major reasons for seeking emergency care. The similarity with the literature here is primarily pathophysiological: the presenting symptoms reflect the causal mechanism of volume loss. In a high-volume ward like Donka, this sometimes nonspecific presentation can delay the diagnosis of shock if peripheral IV fluids are not routinely administered, highlighting the importance of structured clinical triage. Hypotension was present in 94.1% of patients, and blood pressure was unreachable in 5.9% of them. These data are highly consistent with the literature, which describes hypotension, tachycardia, tachypnea, and oliguria as cardinal signs of advanced hypovolemic shock. However, the very high percentage of hypotension suggests that many patients were admitted at an already advanced stage. Its frequency in our series suggests prolonged consultation delays, prior medical treatment, or difficulties in ac-

cessing emergency care early. In our series, cold extremities were found in 62.3% of patients, capillary refill time was prolonged in 36.5% of cases, and pallor was observed in 29.4% of patients. Furthermore, skin turgor was present in 20.0% of patients, cold sweats in 14.1% of cases, while skin mottling was rarely observed, with a frequency of 2.3%. This distribution illustrates the diversity of peripheral manifestations of hypovolemic shock, depending on the stage of progression and the patient's underlying condition. The Glasgow Coma Scale (GCS) score was between 13 and 15 in 83.5% of patients, while 7% had a score of 8 or lower. This distribution is largely explained by the non-traumatic nature of the hypovolemic shock in our series, characterized by the absence of direct cerebral damage, unlike in traumatic situations. Thus, the majority of patients had a preserved level of consciousness. The most severe forms, marked by neurological impairment, are thought to be linked to systemic mechanisms, including cerebral hypoperfusion, severe acidosis, or diabetic decompensation. These results are consistent with data from the literature, which consider lethargy and altered mental status as signs of severity in hypovolemic shock. In our series, the main diagnoses were acute gastroenteritis (25%), diabetic decompensation (22.2%), and gastrointestinal bleeding (19%). This profile differs from classic hypovolemic shock series, which are usually dominated by hemorrhagic causes, particularly traumatic ones. The predominance of acute gastroenteritis is explained by significant fluid and electrolyte losses leading to dehydration. Similarly, diabetic decompensation results in hypovolemia through osmotic diuresis.

In our series, all patients (100%) received peripheral venous access, reflecting the need to ensure rapid vascular access for the initial resuscitation of hypovolemic shock. Central venous catheterization (CVC) was used in 3.5% of patients, indicating that only the most severe cases or those requiring invasive hemodynamic monitoring warranted this procedure. Urinary catheterization was performed in 78.8% of patients, allowing for precise monitoring of urine output and perfusion status, while nasogastric tubes were inserted in only 27% of patients. Finally, transfusion was used in 16.5% of patients. In our study, saline was the most frequently used solution (70.6%), followed by Ringer's solution alone or in combination. Similarly, in the study of Matsanga *et al.* [11], it was reported that fluid resuscitation relied primarily on isotonic saline, used in 85.2% of cases, with a crystalloid-colloid combination in 9.1% of cases. This similarity confirms the central role of isotonic saline in the initial resuscitation of hypovolemic shock, in accordance with international recommendations that advocate the rapid administration of crystalloids as first-line therapy. In our series, 90.6% of patients were transferred after stabilization. The mortality rate observed in the emergency department was 8.2%, a figure that only reflects deaths occurring before any transfer. The majority of patients were transferred to other departments for specialized care.

5. Conclusion

The findings indicate that non-traumatic hypovolemic shock is a frequent emer-

gency in the emergency department, primarily affecting young people, with a marked female predominance. The etiologies were mainly due to fluid and electrolyte depletion, particularly acute gastroenteritis, diabetic decompensation, and gastrointestinal bleeding. These results also highlight the importance of early diagnosis and rapid, appropriate management of non-traumatic hypovolemic shock to improve patient outcomes.

Author Contributions

Summary, introduction, methods, results, discussion, and conclusion: Dr. Mohamed Cissoko, Dr. Kalil Nouny Sidibé, and Dr. Mamadou Diakhaby. First proofreading with suggestions and remarks: Dr. Mohamed Lamine Conté, Dr. Amadou Yalla Camara, Mohamed Moulaye Abdallah, Dr. lanciné Kourouma, Dr. Aboubacar Dioubaté, Dr. Sâa Joseph Téliano, Dr. Mohamed Adama Oularé, Dr. Amara Magassouba, Dr. Kanté Mamadou Aliou II, Dr. Diallo Mamadou Tafsir, Dr. Idrissa Diallo, Dr. Abraham Geopogui, Dr. Oumar Camara, Dr. Abdourahmane Diallo, Dr. Elhadj Salmana Diallo, Dr. Amadou Baillo Barry, and Dr. Fatoumata Bah. Second proofreading and final correction before submission: Pr. Amadou Kaké and Pr. Djibril Sylla.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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