



Immediate Postpartum Hemorrhage at a Type 2 Health Center in Dakar, Senegal (January 2011 - December 2024): Epidemiological and Etiological Aspects

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Abstract: Objectives: To evaluate the management of immediate postpartum hemorrhage at the Nabil Choucair Health Center by describing its epidemiological and etiological aspects. Methodology: This is a retrospective, single-center, analytical, and descriptive study covering a 14-year period, from January 1, 2011, to December 31, 2024. It focuses on 446 women treated for immediate postpartum hemorrhage at the Nabil Choucair Health Center. Data were collected from patient hospitalization records using Google Forms and analyzed using RStudio version 2025.05. Results: The incidence of immediate postpartum hemorrhage was 0.71%. The typical epidemiological profile was that of a pauciparous woman (41.1%), aged 27, who presented spontaneously in 74.4% of cases, with the majority having attended at least four prenatal care visits. Just over a third of the patients (35.4%) had experienced an obstetric or medical complication during pregnancy. During labor, 31.1% of patients presented with at least one abnormality. Deliveries were most frequently vaginal (82.8%), following a full-term pregnancy (89.6%), and resulted in a live, healthy newborn (83.4%). The main causes of immediate postpartum hemorrhage identified were traumatic injuries (67.5%), uterine atony (38.5%), and retained placenta (28.6%). Conclusion: Immediate postpartum hemorrhage remains a frequent and potentially life-threatening obstetric emergency. In our study, it was primarily caused by traumatic injuries, uterine atony, and retained placenta.

Keywords: Immediate postpartum hemorrhage, Nabil Choucair, epidemiology, etiologies.

INTRODUCTION

According to the World Health Organization (WHO), in 2020, approximately 800 women died every day from preventable causes related to pregnancy and childbirth, or one woman every two minutes [1]. Postpartum hemorrhage (PPH) is an obstetric emergency and remains one of the leading causes of preventable maternal morbidity and mortality worldwide, particularly in developing countries. It accounts for 8% of maternal deaths in developed regions and 20% of maternal deaths in developing regions [2].

Immediate postpartum hemorrhage has long been defined as blood loss exceeding 500 ml after vaginal delivery and 1,000 ml after cesarean section, occurring within 24 hours of birth [3]. However, this approach, focused solely on quantification, does not take into account non-external bleeding and clinical manifestations of hypovolemia, thus delaying diagnosis in many cases. In response to these limitations, the American College of Obstetricians and Gynecologists (ACOG) updated this definition in 2017. Now, postpartum hemorrhage (PPH) is characterized by blood loss greater than or equal to 1,000 ml, or by any blood loss associated with signs or symptoms of hypovolemia, regardless of the mode of delivery, within 24 hours of birth [4]. The Royal College of Obstetricians and Gynaecologists,

for its part, classifies postpartum hemorrhage (PPH) according to the volume of blood lost: minor hemorrhage is defined as a loss between 500 and 1,000 ml, while major hemorrhage corresponds to a loss exceeding 1,000 ml [5]. As in many countries around the world, especially in Africa, PPH remains the leading cause of death in Senegal. It complicates 3.1% of all births. It accounts for 44.2% of the direct causes of maternal death and 33.6% of all maternal deaths [6], estimated at 153 deaths per 100,000 live births in 2023 [7].

The audit of deaths related to PPH shows that delayed diagnosis and treatment was often implicated. A study conducted at Pikine Hospital in 2021 shows that only 17.3% of patients received care within two hours. The majority—54.7%—waited between two and four hours, reflecting an overall delay in care provision [8]. Thus, the rapid detection of immediate postpartum hemorrhage is crucial for improving patient outcomes and enabling prompt intervention. Although various medical and surgical treatments are available, their implementation is often challenging in resource-limited settings due to poverty and geographical barriers [9, 10]. The primary causes identified include uterine atony, responsible for 47.1% of cases, and traumatic injuries, accounting for 26.2%, according to a study conducted by Dieme [11] at a level II health center in Dakar. In response to this concerning situation, Senegal's Ministry of Health and Public Hygiene has implemented prevention strategies, such as the introduction of active management of the third stage of labor (AMTSL) and the use of uterotonics in health facilities. Despite these initiatives, immediate postpartum hemorrhage remains a major challenge for maternal health in Senegal. It is therefore essential to strengthen prevention measures and improve patient care in order to reduce maternal mortality and morbidity associated with this complication.

MATERIALS AND METHODS

Study Period and Type

This research is a retrospective, descriptive, and analytical study focusing on patients who experienced immediate postpartum hemorrhage and were treated at the CSNC maternity unit between January 1, 2011, and December 31, 2024.

Study Population

Inclusion Criteria

We included in our study any patient treated at the maternity unit for immediate postpartum hemorrhage following delivery at a gestational age of more than 22 weeks of amenorrhea.

Exclusion Criteria

Patients whose medical records contained a significant amount of missing data were excluded from the study because the records could not be utilized.

Data Collection and Parameters Studied

Data were collected from patients' hospital records using Google Forms.

For each patient, the parameters studied were:

- socio-demographic characteristics (age, gravidity, parity);
- pregnancy history (type of pregnancy, prenatal care);
- admission data (mode of admission, reasons for admission);
- labor and delivery data;
- data on immediate postpartum hemorrhage (etiologies);
- clinical course and outcome.

Operational Definitions of Variables

Primigravida → woman pregnant for the first time.

Paucigravida → woman who has had 2 or 3 pregnancies.

Multigravida → woman who has had more than 3 pregnancies.

Primipara → woman who has given birth once.

Paucipara → woman who has had 2 or 3 deliveries. Multiparous → woman who has had more than 3 deliveries.

Grand multiparous → woman who has had at least 5 deliveries.

Data Analysis

Analysis was performed using RStudio version 2025.05. This process comprised two parts: descriptive analysis and analytical analysis.

Descriptive Analysis

In the descriptive analysis, qualitative variables were described in terms of counts and percentages, while quantitative variables were described using the mean and standard deviation, as well as the range (minimum and maximum values) and the median.

RESULTS

Epidemiological Data

A total of 446 cases of immediate postpartum hemorrhage out of 63,234 deliveries were recorded over a 14-year period—from January 1, 2011, to December 31, 2024—at the Nabil Choucair Health Center, representing a frequency of 0.71%.

Sociodemographic Characteristics

Age

Patient ages ranged from 14 to 45 years. The mean age was 27.6 years, with a standard deviation of 7.0 years. The median age was 27 years, indicating that half of the patients were younger than this age. The majority of postpartum hemorrhage cases occurred in the 20-29 age group, which accounted for 45% (n=193) of the patients (Figure 1).

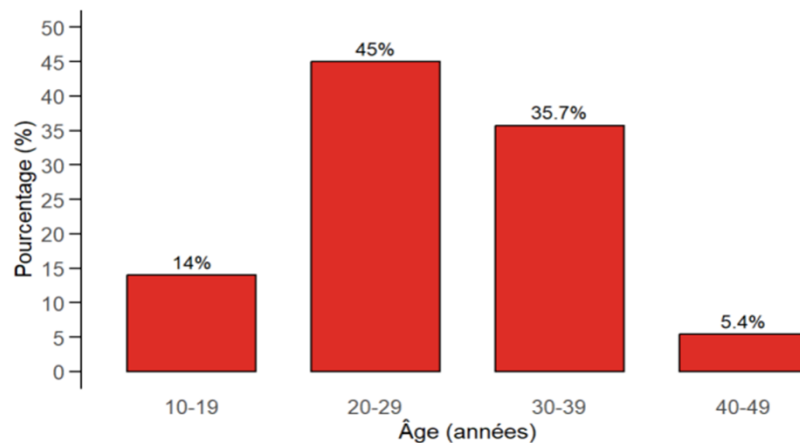


Figure 1: Distribution of patients by age

Gravidity

Mean gravidity was 2.9 pregnancies, with a median of 2. The number of pregnancies ranged from 1 to 13. Primigravidae accounted for 35.1% (n=151) of cases, representing the largest group.

Parity

The mean number of prior deliveries was 1.8, with a median of 1 and a range of 0 to 9 children. Pauciparous women constituted the largest group, accounting for 41.1% (n=176) of cases.

Marital Status

The vast majority of patients were married, representing 98.3% (n=226) of cases. Single women were very few in number, accounting for only 1.7% (n=4) of cases.

History of Cesarean Section

The majority of patients (78.4%, n=131) had never undergone a Cesarean section.

A history of one prior Cesarean section was noted in 16.8% (n=28) of cases,

while 3.6% (n=6) had previously undergone two Cesarean sections.

Finally, 0.6% of patients had undergone three (n=1) or four (n=1) Cesarean sections.

History of PPH

A history of postpartum hemorrhage (PPH) was reported in only one patient.

Etiologies

The most frequent etiology was traumatic injury, found in 67.5% of cases (n=293). This was followed by uterine atony in 38.5% of cases (n=167). Retained placenta was also common, accounting for 28.6% of etiologies (n=124). Coagulation disorders were reported as the cause in 5.8% of cases (n=25) (Table II).

Table II: Distribution of patients according to PPH etiologies

Etiologies	Effectif (n)	Pourcentage (%)
Lésions traumatiques	293	67.5
Déchirures périnéovaginales	119	
Déchirures cervicales	88	
Episiotomies	41	
Rupture utérine	29	
Thrombus vaginal	16	
Atonie utérine	167	38.5
Rétention placentaire	124	28.6
Troubles de la coagulation	25	5.8

DISCUSSION

Strengths and Limitations of the Study

The study addresses a need for local data on a major cause of maternal mortality. Consequently, the results can be used to adjust care protocols at the Nabil Choucair Health Center and serve as a model for other similar facilities. However, this study has certain limitations. First, its single-center design and the observation period—while relatively long (14 years)—limit the scope of the results and their extrapolation to the national level. Second, data collection was hampered by the absence of a computerized system, leading to data loss and affecting the completeness of medical records.

Prevalence

In our study, the frequency of immediate postpartum hemorrhage (PPH) was 0.71%. This figure appears relatively low compared to data from African and international literature.

For instance, Ouattara in Burkina Faso reported a frequency of 9% [12], and Tiruneh in Ethiopia found a similar rate of 8.8% [30]—more than ten times higher than our result. In Senegal, two hospital-based studies by Azzouzi [9] and Kallo [13] reported rates of 2.4% and 2.5% respectively, figures that were also higher than ours. In Morocco, Bouziani [14] reported a frequency of 2.3%, confirming the trend observed in other Maghreb countries.

The incidence of primary postpartum hemorrhage (PPH) in France varies depending on the studies and definitions used. In 2014, Dupont et al. reported a PPH incidence of 6.4% in a large prospective study involving 106 French maternity units [15], with severe PPH occurring in 1.7% of cases. However, in 2016, Vendittelli et al. found lower rates in their HERA study, with a PPH incidence of 3.36% following vaginal delivery and 2.83% following cesarean section, while severe PPH occurred in 1.11% and 1.00% of cases, respectively [16]. These results are significantly higher than those of our study.

This wide variability may be explained by the lack of a common definition for PPH, as well as the absence of systematic and objective measurement of blood loss, given that visual assessment tends to underestimate the volume of hemorrhage.

Sociodemographic Characteristics

Age

In our series, the mean age of patients was 27.6 years, consistent with data from the national literature, where most authors report a mean age of around 28 to 30 years. This is the case for Azzouzi [8], Morelle [17], and Dielia [18]. The 20-29 age group accounted for the majority of cases (45%)—a trend also observed by Diarra in Mali (47.1%) [19]—reflecting the overlap between the peak reproductive years and the occurrence of postpartum hemorrhage. However, some studies, such as the one conducted by Yonta in 2019 at Pikine Hospital, found a predominance in the 30-34 age group [20], highlighting variability depending on the obstetric context. A study by Lahmiri in France confirms that nearly three-quarters of the women concerned were aged 20 to 35, but also shows a significant proportion of women over 35 [21]. These results suggest that while young women remain at the highest risk in absolute terms, late pregnancies also require increased monitoring. Our observations thus align with the general trend described in research conducted in Senegal and the sub-region.

Parity

In our study, the mean number of previous deliveries was 1.8, with a predominance of pauciparous women (41.1%). This result is comparable to those found by Yonta (80.3% pauciparous) [20] and Bouziani (50%) in Morocco [14]. The high representation of pauciparous women can be explained by the fact that they constitute a significant proportion of the active obstetric population, corresponding to the most fertile age groups. From a pathophysiological standpoint, however, immediate postpartum hemorrhage can affect women of any parity. In primiparous and pauciparous women, certain risk factors—such as labor induction, dystocia, or the use of uterotonics—can predispose the patient to uterine atony. Conversely, in multiparous and grand multiparous women, excessive stretching of the myometrium is a recognized cause of uterine inertia, which also places

them at risk for PPH. Thus, while our data confirm the predominance of pauciparous women, they serve as a reminder that PPH is not specific to any single obstetric profile and must be systematically anticipated regardless of parity.

Medical History

In our series, only a history of cesarean section and PPH was considered. A history of cesarean section was present in 21.6% of patients—a higher proportion than that reported by Coulibaly [22] in Mali (10.5%) and Bouziani [14] in Morocco (9.52%). This difference may reflect an increase in the use of cesarean sections in our setting, linked to factors such as evolving obstetric practices, operating room availability, or the selection of high-risk patients.

Only one patient reported a history of PPH, a figure lower than the 9.52% reported by Bouziani in 2020 [14]. Despite this low frequency, the literature highlights that a history of PPH is a significant risk factor for subsequent pregnancies. A Danish study conducted in 2022 found that women who experienced PPH during a previous pregnancy have a 3.5-fold increased risk of recurrence in the next pregnancy [23].

Causes of Immediate Postpartum Hemorrhage

In our study, traumatic injuries were the leading cause of immediate PPH (67.5%), followed by uterine atony (38.5%) and retained placenta (28.6%). These results differ somewhat from several other series, which show a predominance of uterine atony—ranging from 29% in the study by Azzouzi [8] and 37.8% in Togo [24] to as high as 83% in the series by Lahmiri in France [21]. Placental abnormalities also show significant variability depending on the setting: Bouziani [14] in Morocco reported a 61.9% rate of retained placenta, compared to 28.6% in our series. This variability may be explained by differences in population, obstetric practices, quality of prenatal care, and diagnostic criteria; however, it highlights that uterine atony and genital trauma are major causes of immediate PPH across all populations. Coagulation disorders remain rare across all the series studied.

CONCLUSION

Immediate postpartum hemorrhage remains a major obstetric emergency and a significant cause of maternal morbidity and mortality. This study, conducted at the Nabil Choucair Health Center, reveals an incidence of 0.71%, with traumatic injuries, uterine atony, and retained placenta identified as the primary causes. Despite the widespread use of uterotonics and first-line obstetric interventions, delays in care, the high prevalence of anemia, and a case-fatality rate of 4.9% reflect persistent shortcomings in the continuum of care.

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