

The Burden of Geriatric Pregnancies: Maternal Morbidity and Mortality in a Cameroonian Referral Hospital

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Abstract

Introduction: The geriatric pregnancies (≥ 35 years) are accompanied by an increased obstetric risk, which is still poorly documented in referral hospitals in sub-Saharan Africa in general and in Cameroon in particular. **Objective:** To describe maternal outcomes of geriatric pregnancies managed in Douala and to estimate the maternal mortality ratio (MMR) in this population. **Methods:** A cross-sectional study with prospective data collection, conducted over 8 months (January-August 2025) at Laquintinie Hospital in Douala. All pregnancies ≥ 35 years (N=234) were included. The variables analyzed were: delivery route, postpartum complications, causes of maternal death, and etiologies of postpartum hemorrhage (PPH). **Results:** Cesarean sections accounted for 50.8% of deliveries (vaginal delivery 49.2%). Postpartum complications occurred in 20.5% of patients. Eight maternal deaths (3.4%) were recorded, resulting in an MMR of approximately 3,419 per 100,000 live births. Main causes of death included: severe pre-eclampsia/eclampsia (1.3%), disseminated intravascular coagulation (0.4%), hemorrhagic shock (0.4%), pulmonary embolism (0.4%), acute renal failure (0.4%), and postpartum cardiomyopathy (0.4%). PPH affected 9.8% of cases, mainly due to perineal tears (4.7%) and uterine atony/prolonged labor (3.8%), followed by severe anemia (0.9%) and retained placental fragments (0.4%). **Conclusion:** In this urban referral center, geriatric pregnancies are associated with a high cesarean rate, substantial morbidity, and an alarming MMR. Priority measures are necessary: antenatal follow-up adapted to risk (hypertension/diabetes), PPH bundles with objective measurement of

losses, post-cesarean thromboprophylaxis based on risk assessment, and cardio-renal monitoring postpartum. Multicenter studies are needed to refine contextualized protocols.

Keywords

Advanced Maternal Age, Cesarean Section, Postpartum Hemorrhage, Maternal Mortality, Cameroon

1. Introduction

Every two minutes, a woman still dies from causes related to pregnancy or childbirth, and nearly 70% of these deaths occur in sub-Saharan Africa [1]. After significant progress until 2015, the global dynamic has stagnated since 2016, with maternal mortality rates declining too slowly to achieve the SDG 3.1 target by 2030 [2]. At the same time, the age at motherhood is increasing in many regions of the world, reflecting demographic and socio-economic transitions (extended education, labor market participation, access to family planning) and a growing acceptance of late motherhood [3]. Advanced maternal age (AMA, ≥ 35 years) is now recognized as an independent risk factor for maternal and perinatal morbidity and mortality, with a risk gradient that increases beyond 40 years [4]. A meta-analysis involving 31 million pregnancies showed a substantial increase in the risk of maternal mortality, preeclampsia, prematurity, and cesarean delivery among women aged ≥ 40 years (with even higher risks $\geq 45 - 50$ years) [5]. Contemporary data from a large multicenter cohort confirm this dose-response relationship between age and maternal and neonatal complications (cesarean delivery, neonatal admission, ventilation) [6]. In Cameroon, maternal mortality remains high and above global targets, highlighting the need for targeted interventions [7]. In Douala, hospital series at Laquintinie Hospital report particularly high maternal mortality ratios: 1,638 per 100,000 live births between 2011-2016 and 1,176 per 100,000 between 2017-2022, with a predominance of hemorrhages and hypertensive complications as direct causes [8] [9]. In resource-constrained settings, the interaction between age-related biological factors, comorbidities, access inequalities, and delays in care contributes to an avoidable excess risk [10]. Objective of the Study: To describe, in our urban referral context in Douala, the burden and maternal outcomes associated with AMA and to estimate the association between AMA and maternal mortality at Laquintinie Hospital, in order to identify avenues for prevention and optimization of care.

2. Methods

2.1. Type and Setting of the Study

We conducted a cross-sectional study with prospective data collection at the obstetrics and gynecology department of Laquintinie Hospital in Douala (Came-

room), a tertiary referral hospital receiving patients from the Littoral region and beyond. The study was conducted over a period of 8 months, from January to August 2025.

2.2. Study Population

Included were all pregnant women aged 35 years and older admitted for prenatal follow-up or delivery during the considered period. Excluded were patients with incomplete records or with pregnancies that ended in the first trimester or abortions before 28 weeks of gestation.

2.3. Sample Size and Sampling Technique

An exhaustive sampling was conducted, including all geriatric pregnancies recorded in the obstetric register. The final sample size was $N = 234$.

2.4. Variables Studied

- **Sociodemographic and clinical characteristics:** Maternal age, marital status, education level, occupation, parity, medical history (hypertension, diabetes, HIV, sickle cell disease), history of cesarean section, prenatal follow-up (antenatal visits, supplementation, intermittent preventive treatment, aspirin, calcium).
- **Pregnancy outcomes:** Mode of delivery (cesarean/vaginal), maternal deaths and their causes (hemorrhage, eclampsia, infections, pulmonary embolism, renal failure, acute pulmonary edema, severe anemia).

2.5. Data Collection

Information was extracted from obstetric records, delivery registers, and operative reports using a standardized data collection form validated by the research team.

2.6. Statistical Analysis

The data were entered and analyzed using SPSS version 26.0. Qualitative variables were expressed as frequencies and percentages.

2.7. Ethical Considerations

The study received an administrative authorization from Laquintinie Hospital. Data confidentiality was respected, with anonymization of records.

3. Results

3.1. Maternal Outcomes of Geriatric Pregnancies

3.1.1. Mode of Delivery

In older patients, the proportion of cesarean sections is particularly high (50.8%), almost equivalent to vaginal deliveries (49.2%). This frequency reflects obstetric caution due to increased risks associated with advanced maternal age: dystocia,

labor abnormalities, fetal distress, and associated comorbidities.

3.1.2. Indications for Cesarean Section

The most frequent indications were dominated by a multi-scarred uterus (16.7%), reflecting a more complex obstetric history in these women. This was followed by severe pre-eclampsia and eclampsia (9.8%) and acute fetal distress (6.8%), two complications more often reported in geriatric pregnancies due to fragile vascular conditions and aging of the uterine-placental unit. Third-trimester hemorrhages (3.8%), malpresentations (2.6%), and cases of macrosomia associated with a scarred uterus (3.4%) complete this high-risk profile.

3.1.3. Postpartum Complications

Nearly one in five patients experienced a complication (20.5%). The most frequent were postpartum hemorrhage (9.8%) and the continuation of severe hypertensive syndrome (4.7%). The most severe outcomes included maternal deaths (3.4%) and rarer conditions such as postpartum cardiomyopathy (0.4%) or puerperal psychosis (0.4%). These figures highlight the particular vulnerability of older patients to hemorrhagic, hypertensive, and cardiovascular complications (**Table 1**).

Table 1. Maternal issues of geriatric pregnancies (N = 234).

Variables	Number (N)	Percentage (%)
Delivery route		
Low	115	49.2
High	119	50.8
Indication for cesarean		
Fetal distress (SFA)	16	6.8
Multi-scarred uterus	39	16.7
Pre-eclampsia/Eclampsia	23	9.8
3rd trimester hemorrhage	9	3.8
Macrosomia/scarred uterus	8	3.4
Malpresentation	6	2.6
Others	18	7.7
Gestational age at delivery		
28 - 32 weeks	8	3.4
33 - 36 weeks	41	17.5
37 - 41 weeks	173	73.9
≥42 weeks	8	3.4
Complications		
Yes	48	20.5
No	186	79.5

Continued

Type of complications		
Death	8	3.4
Postpartum hemorrhage	23	9.8
Postpartum cardiomyopathy	1	0.4
Severe pre-eclampsia/Eclampsia	11	4.7
Postpartum endometritis	3	1.3
Puerperal psychosis	1	0.4

3.2. The Causes of Maternal Deaths Found in Our Study

3.2.1. Overall Profile

A total of 8 maternal deaths were recorded among the 234 deliveries (3.4%), indicating a high lethality rate. The causes are multiple and reflect the pathophysiological complexity of geriatric pregnancies, where hypertensive, hemorrhagic, and cardiovascular complications play a central role. The maternal mortality ratio (MMR) is 3419 deaths per 100,000 live births. This MMR is nearly 7 times higher than the national average in Cameroon (=467/100,000 live births according to WHO 2022). The explanation lies in: the small size of the cohort (N = 234); the specific profile of the patients (geriatric pregnancies, associated pathologies), and the nature of the hospital (a reference center receiving complicated cases).

3.2.2. Hypertensive Causes

Severe preeclampsia was the main cause of death (3 cases, 1.3%). This confirms the strong association between advanced maternal age and hypertensive disorders, facilitated by increased vascular stiffness, placentation abnormalities, and the frequent coexistence of chronic comorbidities (essential hypertension, obesity, diabetes). In many African series, preeclampsia is also the leading cause of maternal death, underscoring the importance of appropriate prenatal monitoring.

3.2.3. Hemorrhagic and Hemostatic Causes

Two deaths were linked to hemorrhagic complications:

- Disseminated intravascular coagulation (DIC) (0.4%), often a consequence of a major obstetric complication (severe preeclampsia, massive hemorrhage, placental abruption).
- Hemorrhagic shock (0.4%), a classic and always feared cause during the peripartum period. In older women, physiological reserves are lower, increasing vulnerability to blood loss.

3.2.4. Thromboembolic and Cardiovascular Causes

Two deaths highlighted the cardiovascular frailty of these patients:

- Pulmonary embolism (0.4%), favored by age, frequent cesarean section, and prolonged bed rest.
- Postpartum cardiomyopathy (0.4%), a rare but serious complication, with an increased risk after 35 years, probably due to combined myocardial and hor-

monal mechanisms.

3.2.5. Renal Causes

One death was attributed to acute kidney failure (0.4%), a complication often secondary to severe hypertensive disorders or major hemorrhages. This cause illustrates the multivisceral impact of severe obstetric complications (**Table 2**).

Table 2. Causes of maternal deaths.

Causes of Death	Number (N = 234)	Percentage (%)
Severe preeclampsia	3	1.3
Disseminated intravascular coagulation	1	0.4
Hemorrhagic shock	1	0.4
Pulmonary embolism	1	0.4
Acute kidney failure	1	0.4
Postpartum cardiomyopathy	1	0.4
Total	8	3.4

3.3. Causes of Postpartum Hemorrhage Identified in Our Study

3.3.1. Overall Profile

Out of the 234 deliveries studied, 23 cases of postpartum hemorrhage (PPH) were recorded, indicating a frequency of 9.8%. This rate is relatively high compared to expected data in the general population (approximately 6-8% according to African series), reflecting the particular vulnerability of geriatric pregnancies to hemorrhagic complications.

3.3.2. Mechanical Causes: Perineal Tears

Perineal tears were the most frequent cause (11 cases, 4.7%). In older women, the fragility of soft tissues, combined with reduced perineal elasticity and sometimes dystocic deliveries, increases the likelihood of traumatic tears leading to PPH.

3.3.3. Functional Causes: Uterine Atony

Uterine atony secondary to prolonged labor was found in 9 cases (3.8%). Advanced maternal age is recognized as a risk factor for uterine inertia, due to decreased myometrial contractility and an increased frequency of labor anomalies, often exacerbated by induction or artificial augmentation.

3.3.4. Retention Causes

Retention of placental fragments was reported in only 1 case (0.4%), which remains relatively rare in this series. However, it is a classic cause of PPH, requiring increased vigilance at the time of delivery.

3.3.5. General Causes: Severe Anemia

Finally, 2 cases (0.9%) of PPH were associated with severe anemia, which, although not a direct cause, is a major aggravating factor by reducing hemodynamic

compensatory capacity and increasing mortality related to blood loss (**Table 3**).

Table 3. Causes of postpartum hemorrhage.

Causes of PPH	Number (N = 234)	Percentage (%)
Perineal tears	11	4.7
Uterine atony/Prolonged labor	9	3.8
Retention of placental fragments	1	0.4
Severe anemia	2	0.9
Total	23	9.8

4. Discussion

In this cohort of women aged ≥ 35 years ($N = 234$) managed at Laquintinie Hospital in Douala, we observed a high cesarean rate (50.8%), substantial postpartum morbidity (20.5%), and eight maternal deaths (3.4%), resulting in a maternal mortality ratio (MMR) estimated at approximately 3,419 per 100,000 live births. These results align with a global trend of rising maternal age and associated obstetric burden, with a recent stagnation in the decline of maternal mortality worldwide [11]-[13]. In the Cameroonian context, our figures significantly exceed recent national estimates and align with warning signals at the reference hospital level [7]-[10].

4.1. Postpartum Hemorrhage (PPH)

The proportion of PPH (9.8%) in our series is largely driven by perineal tears (4.7%) and uterine atony/prolonged labor (3.8%). Recent evidence supports a “bundle” approach based on early detection, objective measurement of blood loss, and a standardized combined treatment (oxytocics, tranexamic acid, compression, resuscitation). The E-MOTIVE trial demonstrated a significant reduction in severe hemorrhages with this bundle, which WHO included in its 2023 recommendations [14] [15].

4.2. Thromboembolic Risk after Cesarean Section

Given the cesarean rate and risk profiles (advanced maternal age, obesity, preeclampsia), systematic stratification and post-cesarean antithrombotic prophylaxis should be considered according to evidence-based recommendations (intermittent pneumatic compression, compression stockings, LMWH according to risk level) [16].

4.3. Hypertension/Preeclampsia

Advanced maternal age is associated with an increased risk of gestational hypertension and preeclampsia. In low- and middle-income countries, priorities include early detection, low-dose aspirin for high-risk women, education on warning signs, and harmonization of management protocols; a 2024 synthesis details operational pathways adapted to available resources [17].

4.4. Mode of Delivery and Advanced Maternal Age

Our results (50.8% cesarean rate) are consistent with international data indicating an increased use of cesarean sections with maternal age [5] [6]. Among women “≥45 years,” a recent meta-analysis confirms a rise in the risk of cesarean delivery and adverse maternal-fetal outcomes, advocating for increased anesthetic and transfusion preparedness [18].

4.5. Maternal Morbidity and Mortality

The frequency of postpartum complications (20.5%) and observed MMR should be considered in light of the severity of risk factors: preeclampsia/eclampsia, hemorrhage, pulmonary embolism, renal impairment, and postpartum cardiomyopathy. Multicentric analyses confirm that advanced maternal age increases the risk of maternal morbidity and mortality, particularly in resource-constrained systems [11]-[13]. These data align with the global synthesis of maternal health determinants, which emphasizes the importance of organizing care beyond childbirth [10].

4.6. Strengths and Limitations

Our study is prospective and centered on a reference hospital, allowing for detailed clinical data but limiting generalization (single center, 8-month duration). Additionally, the MMR estimation within an AMA subgroup should be interpreted cautiously; multicentric/case-control studies are necessary to clarify the modifiable factors identified in our results.

4.7. Practical Implications

Our data support a “high-value” intervention package for AMA: risk-adapted antenatal care (screening for hypertension/diabetes, preeclampsia prevention), intrapartum preparation (available blood, team trained in PPH management, antibiotic prophylaxis), post-cesarean thromboembolic risk stratification, and cardio-renal postpartum surveillance. These measures, supported by local and regional data, could help bring results closer to international standards [4]-[6] [14]-[17].

4.8. Recommendations

These results advocate for:

1. Enhanced prenatal care targeting hypertensive and cardiovascular comorbidities;
2. Intrapartum anticipation with transfusion preparation and thromboembolic prevention;
3. Strict postnatal follow-up, including cardiovascular and renal screening;
4. Development of African multicentric studies dedicated to geriatric pregnancies, to consolidate data and guide local recommendations.

5. Conclusion

Our study highlights the high maternal morbidity and mortality associated with

geriatric pregnancies in the Cameroonian context. These results remind us that advanced maternal age should be considered a major risk factor, requiring anticipatory and multidisciplinary obstetric management. Prevention involves targeted prenatal care, adequate logistical preparation for delivery, and enhanced postpartum monitoring to reduce the impact of hypertensive, hemorrhagic, and cardiovascular complications. Finally, the establishment of regional multicentric studies and national protocols adapted to late pregnancies is a priority for improving maternal health and achieving sustainable development goals (SDG 3.1).

Author Contributions

All authors participated in the development of this work.

Conflicts of Interest

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

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