EAS Journal of Radiology and Imaging Technology
Abbreviated Key Title: EAS J Radiol Imaging Technol
ISSN: 2663-1008 (Print) & ISSN: 2663-7340 (Online)
Published By East African Scholars Publisher, Kenya

Volume-7 | Issue-6 | Nov-Dec-2025 | DOI: https://doi.org/10.36349/easjrit.2025.v07i06.005

OPEN ACCESS

Original Research Article

Obstetric Ultrasound in Diagnosing Third-Trimester Pregnancy-Related Metrorrhagia: Insights from Ngaoundéré, Cameroon

Samuel Mbozo'o Mvondo[1]*, Onana Yannick Richard[1], Aminou Mohamadou[1], Neossi Nguena Mathurin[3], Jeremie Mbo Amvene[1], Boniface Moifo[1], Odile Fernande Zeh[2]

[1]Faculty of Medicine and Biomedical Sciences of Garoua, University of Garoua (Cameroon)
[2]Faculty of Medicine and Biomedical Sciences, University of Yaoundé 1(Cameroon)
[3]FAculty of sciences, University of Ngaoundéré (Cameroon)

Article History
Received: 03.03.2025
Accepted: 09.04.2025
Published: 17.12.2025

Journal homepage:
https://www.easpublisher.com

Quick Response Code

Abstract: We conducted a descriptive cross-sectional study, at the Regional Medical Imaging Center of Ngaoundéré (CRIMN), Cameroon, evaluating the diagnostic utility of obstetric ultrasound in identifying causes of third-trimester metrorrhagia (vaginal bleeding ≥28 weeks of gestation). From May to October 2021, 30 women with metrorrhagia among 302 obstetric ultrasound referrals were included. The prevalence of third-trimester bleeding was 9.93%, with retroplacental hematoma (30%), intrauterine fetal death (23%), and premature rupture of membranes (20%) as leading causes. Placenta previa accounted for 10%. Notably, 60% of bleeding episodes in viable pregnancies had no identifiable ultrasound etiology—a rate higher than in high-resource settings. Sociodemographic analysis revealed younger women (18–25 years) were disproportionately affected by fetal death and membrane rupture, while placental abruption predominated in older women (26–35 years). Urban residence (63%) suggested potential referral bias, whereas rural representation (37%) highlighted gaps in prenatal care access. The study underscores obstetric ultrasound's crucial role in diagnosing life-threatening conditions (e.g., abruption, previa) in low-resource settings. However, its limitations in detecting subtle etiologies emphasize the need for complementary diagnostics and improved operator training. These findings advocate for enhanced prenatal monitoring and targeted interventions to reduce maternal-fetal morbidity in sub-Saharan Africa. Strengths included standardized imaging protocols and ethical rigor, while limitations involved sample size constraints and the single-center design.

Keywords: Obstetric ultrasound, Third-trimester bleeding, Maternal-fetal morbidity.

INTRODUCTION

Metrorrhagia refers to abnormal genital bleeding occurring outside of menstruation. Its causes and origins vary depending on when it occurs during the menstrual cycle or pregnancy [1]. Obstetric ultrasound, a medical imaging technique using sound waves to visualize the fetus, placenta, uterus, and adnexa, plays a critical role in diagnosing the etiology of metrorrhagia, assessing maternal-fetal prognosis, and guiding therapeutic management [2].

Third-trimester metrorrhagia, defined as genital bleeding occurring after 28 weeks of amenorrhea, constitutes an obstetric emergency due to its potential to endanger maternal and fetal lives [3]. Its prevalence is estimated at 2–5% of pregnancies, with etiologies ranging from life-threatening conditions like placenta previa, placental abruption, uterine rupture, and Benckiser hemorrhages to benign causes such as cervical lesions, decidual hematomas, threatened preterm labor, or membrane rupture. In 5–20% of cases, no identifiable cause is found [2].

Obstetric ultrasound is indispensable for diagnosing third-trimester metrorrhagia. It localizes the placenta, detects retroplacental hematomas, measures amniotic fluid volume, estimates fetal weight, and assesses fetal vitality. It also informs delivery mode selection and labor monitoring [4]. However, its utility is constrained by factors such as equipment quality, operator expertise, patient cooperation, and fetal positioning. False reassurance or misdiagnosis may

***Corresponding Author:** Samuel Mbozo'o Mvondo
Faculty of Medicine and Biomedical Sciences of Garoua, University of Garoua (Cameroon)

occur, and access to ultrasound remains limited in certain regions or contexts [2].

Research Question: *What is the diagnostic value of obstetric ultrasound in identifying the causes of third-trimester metrorrhagia in Ngaoundéré, Cameroon?* This question arises from the scarcity of studies on this topic in the region's geographical and cultural context [5]. Our study aims to evaluate the performance of obstetric ultrasound in diagnosing third-trimester metrorrhagia and its impact on patient management.

METHODOLOGY

Study Design and Setting

A descriptive cross-sectional study was conducted at the Regional Medical Imaging Center of Ngaoundéré (CRIMN), located within the Ngaoundéré Regional Hospital (HRN) in Cameroon's Adamaoua region. CRIMN is equipped with a GE LOGIQ 7 ultrasound machine and four probes (linear, sectorial, convex, and endocavitary). The study spanned May 1 to October 31, 2021.

Study Population

- **Source population:** Pregnant women referred to CRIMN for obstetric ultrasound during the study period.
- **Target population:** Women in their second or third trimester presenting with metrorrhagia (vaginal bleeding) during prenatal consultations.

Inclusion and Exclusion Criteria

- **Included:** Pregnant women in the second/third trimester with metrorrhagia who provided informed consent.
- **Excluded:** Women declining participation or with contraindications to ultrasound.

Sampling and Data Collection

A consecutive and exhaustive sampling approach was used. All eligible patients meeting inclusion criteria were enrolled (n = 120). Data were collected using a pre-validated form, capturing:

- **Sociodemographics:** Age, parity, education, occupation, marital status.
- **Clinical history:** Prior pregnancies, delivery modes, complications.
- **Bleeding characteristics:** Onset, duration, severity, associated symptoms (e.g., uterine contractions, fetal movements).
- **Ultrasound findings:** Placental location, retroplacental hematoma, amniotic fluid volume, fetal weight, fetal vitality.
- **Etiological diagnosis:** Placenta previa, placental abruption, uterine rupture, Benckiser hemorrhage, or other causes.

Ultrasound Protocol

Examinations were performed via abdominal or endovaginal approaches using GE LOGIQ 7 probes (convex/endocavitary). Standardized criteria were applied for diagnoses, such as:

- **Placenta previa:** Placenta covering the internal cervical os.
- **Retroplacental hematoma:** Placental detachment with hematoma.
- **Fetal demise:** Absence of fetal cardiac activity.

Statistical Analysis

Data were analyzed using Excel 2019 and SPSS. Descriptive statistics (frequencies, percentages, means, standard deviations) summarized population characteristics. Inferential statistics (Chi-square test, $\alpha = 0.05$) evaluated associations between variables (e.g., age and ultrasound findings). Results were presented in tables and graphs.

Ethical Considerations

Approval was obtained from the HRN Ethics Committee and regional health authorities. Participants provided written informed consent, with guarantees of confidentiality, anonymity, and voluntary withdrawal.

RESULTS

Prevalence of Metrorrhagia

Of 302 women undergoing obstetric ultrasounds, 30 presented with second/third-trimester metrorrhagia, yielding a prevalence of 9.93%.

Sociodemographic Profile

- **Age:** Most cases occurred in women aged 18–25 years (46.66%) and 26–35 years (26.66%), with a mean age of 25.8 years (range: 16–45).
- **Parity:** Primiparas predominated (43%), followed by multiparas (40%) and pauciparas (17%).
- **Residence:** 63% urban vs. 37% rural.
- **Occupation:** Housewives (37%) were most represented.
- **Marital status:** Married women (88%), single (9%), widowed (3%).

Clinical Characteristics

- **Indications for ultrasound:** Prenatal checkups (33.33%), bleeding during pregnancy (26.66%), threatened abortion (13.33%), amniotic fluid assessment (10%), and pelvic pain.
- **Prenatal care:** Only 52% completed key clinical/biological assessments (e.g., tetanus vaccination, blood typing).

Ultrasound Diagnoses

Five etiologies were identified (Table 1):

1. **Retroplacental hematoma:** 30% (n = 9).
2. **Intrauterine fetal demise (IUFD):** 23% (n = 7).
3. **Premature rupture of membranes (PROM):** 20% (n = 6).
4. **Viable intrauterine pregnancy with bleeding:** 17% (n = 5).
5. **Placenta previa:** 10% (n = 3).

Notably, 60% of bleeding episodes in viable pregnancies had no identifiable ultrasound etiology.

Statistical Associations

- **Age and diagnosis:** Retroplacental hematoma was most frequent in women aged 26–35 years (n = 4), while IUFD and PROM predominated in 18–25-year-olds (n = 4 each) (*Chi² = 79.25, p < 0.05*) (Table 2).
- No significant link was found between ultrasound findings and clinical indications (*Chi² = 23.06, p > 0.05*).

Table 1: Distribution of Ultrasound Diagnoses

Diagnosis	Frequency (n)	Percentage (%)
Retroplacental hematoma	9	30
Intrauterine fetal demise	7	23
PROM	6	20
Viable pregnancy	5	17
Placenta previa	3	10
Total	**30**	**100**

Table 2: Age Distribution of Diagnoses

Diagnosis / Age (years)	<18	18–25	26–35	>35	Total
Retroplacental hematoma	0	3	4	2	9
IUFD	1	4	0	2	7
PROM	0	4	1	1	6
Viable pregnancy	1	2	1	1	5
Placenta previa	0	1	2	0	3
Total	**2**	**14**	**8**	**6**	**30**

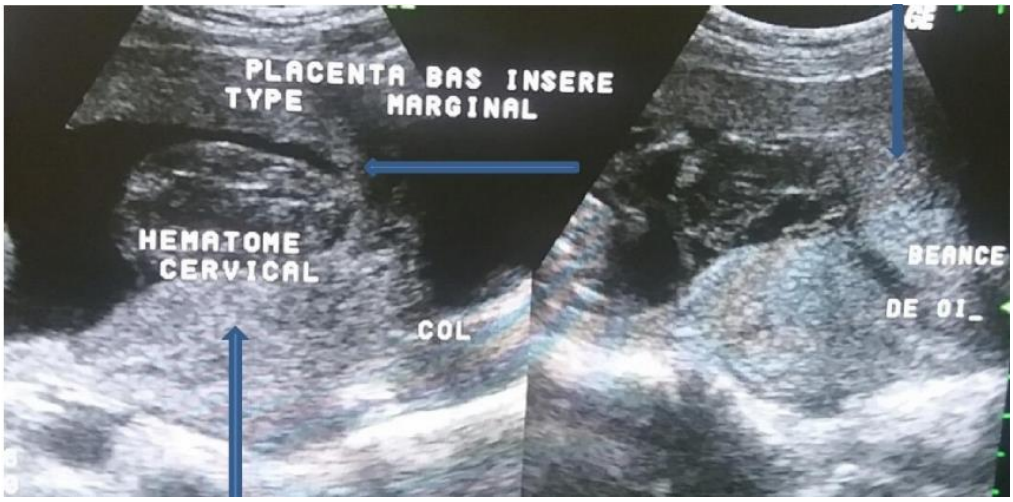

Figure 1: This ultrasound of a 32 years old bleeding pregnant woman in our study reveals a low-lying marginal placenta with an associated cervical hematoma and dilation of the internal cervical os

DISCUSSION

The findings of this cross-sectional study conducted at the Regional Medical Imaging Center of Ngaoundéré (CRIMN) provide critical insights into the etiologies and epidemiological correlates of metrorrhagia during the second and third trimesters of pregnancy in a Cameroonian setting. Below, we contextualize these results within the broader literature, highlighting consistencies, divergences, and implications for clinical practice.

Prevalence and Etiological Distribution of Metrorrhagia

The prevalence of metrorrhagia among women referred for obstetric ultrasound was 9.93% (30/302), a figure higher than the 2–5% reported in high-income settings but consistent with studies from sub-Saharan Africa, where limited access to prenatal care may delay diagnosis of complications [1,2]. The leading etiology identified was retroplacental hematoma (30%), followed by intrauterine fetal death (23%) and premature rupture of membranes (20%). Placenta previa accounted for 10% of cases, aligning with global estimates [3]. Notably, 60% of bleeding episodes in viable pregnancies lacked a discernible ultrasound etiology, a proportion exceeding the 20–30% reported in high-resource cohorts [4]. This discrepancy may reflect limitations in ultrasound sensitivity for early placental abruption or decidual hemorrhage, compounded by the study's reliance on a single imaging modality.

Socio-Demographic and Clinical Correlates

Younger women (18–25 years) predominantly presented with intrauterine fetal death and premature rupture of membranes, whereas placental abruption was more frequent in older patients (26–35 years). This aligns with evidence linking advanced maternal age to placental dysfunction [5] and younger age to infections or trauma-associated premature rupture of membranes [6]. The predominance of primiparas (43%) contrasts with studies associating multiparity with placenta previa [7], suggesting regional variations in risk factors, such as limited access to cesarean sections or differences in fertility patterns.

Urban residency (63% of cases) may reflect referral bias, as CRIMN serves as a regional hub. However, the 37% rural representation underscores systemic gaps in rural prenatal care, potentially delaying management of bleeding complications [8].

Diagnostic and Methodological Considerations

The use of transabdominal and endovaginal ultrasonography with a GE LOGIQ 7 device adheres to international standards [9]. However, the high rate of unexplained bleeding (60%) raises questions about diagnostic comprehensiveness. While ultrasound remains the cornerstone for evaluating antepartum hemorrhage, its sensitivity for partial placental abruption is limited (70–80%) [10], particularly in chronic cases. Complementary tools like MRI or serial clinical assessments could enhance diagnostic accuracy but are often unavailable in resource-limited settings.

Strengths and Limitations

This study's strengths include its standardized imaging protocol, consecutive sampling, and ethical rigor. However, limitations include its single-center design, potential selection bias (tertiary-care referrals), and retrospective data collection from clinical forms, which may underreport nuanced symptoms. The exclusion of women with contraindications to ultrasound (e.g., hemodynamic instability) further limits generalizability.

Implications for Practice and Research

The high burden of intrauterine fetal death and premature rupture of membranes underscores the need for improved prenatal education and timely referrals in low-resource settings. The predominance of unexplained bleeding warrants heightened clinical vigilance and consideration of adjunctive diagnostics where feasible. Future studies should integrate longitudinal follow-up, biochemical markers (e.g., placental growth factor), and qualitative assessments of care-seeking behaviors to address etiological gaps.

CONCLUSION

This study highlights the complex etiological landscape of metrorrhagia in Cameroon, characterized by a high prevalence of placental abruption and fetal demise. While ultrasonography remains indispensable, its limitations in resource-constrained contexts necessitate a multifaceted diagnostic approach. These findings advocate for enhanced training in obstetric imaging and targeted interventions to mitigate preventable causes of maternal and fetal morbidity.

REFERENCES

1. Knight M, Kenyon S, Brocklehurst P, Neilson J, Shakespeare J, Kurinczuk JJ (Eds.). Saving Lives, Improving Mothers' Care: Lessons Learned to Inform Future Maternity Care from the UK and Ireland Confidential Enquiries into Maternal Deaths and Morbidity 2009–2012. Oxford: National Perinatal Epidemiology Unit, University of Oxford; 2014.
2. Tukur J, Galadanci H, Adeleke SI, Muhammad Z. Maternal mortality in northern Nigeria: findings of a health facilities-based study. Afr J Reprod Health. 2012;16(3):119–25.
3. Silver RM. Abnormal placentation: placenta previa, vasa previa, and placenta accreta. Clin Obstet Gynecol. 2015;58(3):612–24.
4. Nyberg DA, Mack LA, Benedetti TJ, Cyr DR, Schuman WP. Placental abruption and placental hemorrhage: correlation of sonographic findings with fetal outcome. Radiology. 1987;164(2):357–61.
5. Lean SC, Derricott H, Jones RL, Heazell AEP. Advanced maternal age and adverse pregnancy outcomes: a systematic review and meta-analysis. PLoS One. 2017;12(10):e0186287 .
6. Mercer BM. Preterm premature rupture of the membranes. Obstet Gynecol. 2003;101(1):178–93.
7. Faiz AS, Ananth CV. Etiology and risk factors for placenta previa: an overview and meta-analysis of observational studies. J Matern Fetal Neonatal Med. 2003;13(3):175–90.
8. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels J, et al. Global causes of maternal death: a WHO systematic analysis. Lancet Glob Health. 2014;2(6):e323 –33.
9. American Institute of Ultrasound in Medicine. AIUM practice guideline for the performance of obstetric ultrasound examinations. J Ultrasound Med. 2019;38(4):1083–101.
10. Glantz C, Purnell L. Clinical utility of sonography in the diagnosis and treatment of placental abruption. J Ultrasound Med. 2002;21(8):837–40.

Cite This Article: Samuel Mbozo'o Mvondo, Onana Yannick Richard, Aminou Mohamadou, Neossi Nguena Mathurin, Jeremie Mbo Amvene, Boniface Moifo, Odile Fernande Zeh (2025). Obstetric Ultrasound in Diagnosing Third-Trimester Pregnancy-Related Metrorrhagia: Insights from Ngaoundéré, Cameroon. *EAS J Radiol Imaging Technol, 7*(6), 209-212.

