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Prognostic Factors for Retroplacental Hematoma at the Yalgado Ouédraogo University Hospital in Ouagadougou, Burkina Faso

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Abstract

Objective: This study aimed to investigate retroplacental hematoma (RPH) at Yalgado Ouédraogo University Hospital, focusing on identifying prognostic factors to enhance maternal and perinatal outcomes. **Methodology**: A retrospective analysis was conducted on 95 women admitted for RPH between June 2023 and May 2024, selected based on the completeness of medical records. Data regarding sociodemographic characteristics, clinical history, and treatment outcomes were collected and analysed using R software, employing both univariate and multivariate analyses to identify significant risk factors. **Results:** The frequency of RPH was found to be 1% of total deliveries. The study recorded a maternal mortality rate of 3.2% and a stillbirth rate of 60%. Key factors associated with stillbirth included being a housewive (ORa = 4.24, (95% CI [1.54 - 12.38], p = 0.006), transfer from other healthcare facilities (ORa = 3.49, 95% CI [1.20 - 11.05], p = 0.026), and the sex of the fetus, with male infants showing a higher association (ORa = 3.56, 95% CI [1.27 - 10.91], p = 0.019). The factor associated with severe anaemia was the absence of pre-eclampsia (Ora = 3.18, 95%IC [1.28 - 8.34], p = 0.015). **Conclusion:** The findings underscore the critical need for timely diagnosis, effective management, and access to emergency obstetric services to mitigate risks associated with RPH. Understanding the identified prognostic factors can facilitate better clinical decision-making and improve health outcomes for affected mothers and newborns.

Keywords

Retroplacental Haematoma, Prognostic Factors, Yalgado Ouédraogo University Hospital, Burkina Faso

1. Introduction

Retroplacental hematoma (RPH) is characterized by the accumulation of maternal blood in the space between the maternal surface of the placenta and the adjacent uterine wall, occurring after 20 weeks of gestation and prior to the delivery of the fetus [1]. This condition signifies a loss of maternal vascular integrity, leading to haemorrhage in the retroplacental area. RPH constitutes a serious obstetric complication, representing one of the primary causes of metrorrhagia in the third trimester of pregnancy and frequently contributing to stillbirth and maternal death.

The incidence of RPH affects approximately 0.4% to 1% of pregnancies, with regional variations in its prevalence: it accounts for 0.25% of deliveries in France [2]. while in Morocco, the incidence is reported at 0.8%. At the Maradi mother and child health center in Maradi, RPH frequency is estimated at 5.2% of deliveries [3]. Identified risk factors for RPH include pre-eclampsia, induction of labour with oxytocin, and a history of unfavourable obstetric outcomes [4].

Fetal mortality is particularly high, reaching 77% in some studies in Mali and 69.76% in Morocco, with a high proportion of deaths in utero [5] [6]. In Burkina Faso, a recent study at the Yalgado Ouédraogo University Hospital showed a maternal case-fatality rate of 5.6% and an alarming perinatal mortality rate of 63.9% [7]. Initiatives have been put in place to improve the management of obstetric emergencies. Free care for pregnant women and children under five, as well as training for medical staff, aim to reduce the number of cases of RPH. The International Federation of Gynaecology and Obstetrics has introduced emergency protocols to aid diagnosis and treatment in health facilities [8]. This study aims to identify prognostic factors for RPH to enhance treatment.

2. Methodology

The study was designed as an analytical cross-sectional investigation with retrospective data collection, aiming to analyse the factors that may influence the perinatal prognosis of retroplacental hematoma. The study population comprised women admitted to the obstetrics and gynaecology department at Yalgado Ouédraogo University Hospital for retroplacental hematoma (RPH) from June 1, 2023, to May 31, 2024. Only those women with complete and usable medical records who were hospitalized for RPH were included in this analysis. One woman whose gestational age was unknown and 2 women for whom there was no information on placental examination were excluded from the study. Only cases of retroplacental hematoma confirmed by the presence of a placental cup and/or a blood clot were included in this study. Patients with suspected HPR on ultrasound

without placental cup or blood clot were excluded from the study. Multiple pregnancies were excluded from the analysis.

Data collection encompassed various dimensions, including the patients' sociodemographic characteristics, reasons for admission, medical histories, pregnancy histories, clinical signs, treatment details, and maternal and perinatal outcomes. Information was gathered from admission registers, medical records, and operative reports.

The collected data were checked, coded, and entered into a computer database for analysis using R software. Descriptive statistics were reported as percentages and means. Prognostic factors were initially determined using univariate analysis, which was then complemented by multivariate analysis to compute odds ratios for a deeper assessment of these factors. Any variables that exhibited a two-tailed p-value of less than 0.05 in the bivariate analysis were included in the binary logistic regression model to pinpoint the factors linked to RPH Additionally, adjusted odds ratios (adjusted ORa) along with 95% confidence intervals were calculated.

From an ethical perspective, administrative approval was obtained from the Director General of the hospital and the head of the gynaecology and obstetrics department. Patient confidentiality was ensured, with no identifiable information being included on the data collection forms.

3. Results

3.1. Frequency

In 2024, 95 cases of RPH were recorded out of 9,401 deliveries, resulting in a frequency of 1%. Figure 1 shows a breakdown of RPH cases by month.

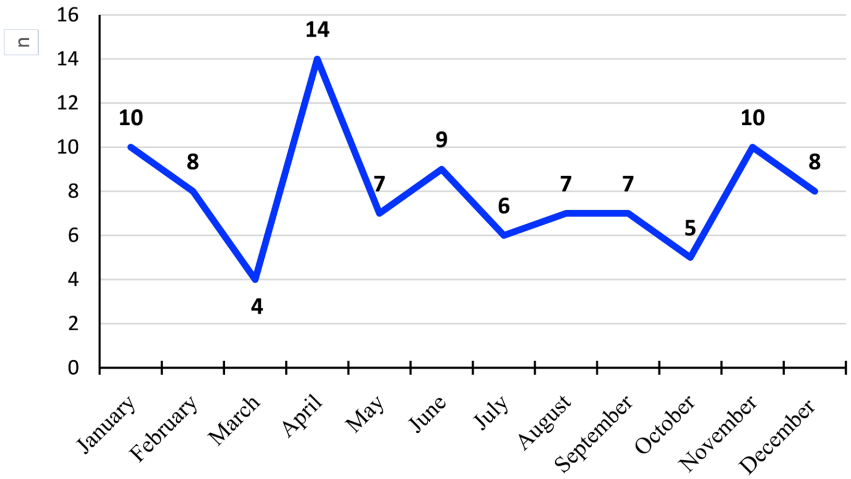

Figure 1. Number of HPR cases per month in 2024 at Yalgado Ouédraogo University Hospital.

3.2 Patients' Characteristics

The average age of the patients was 26.8 ± 6.2 years, with a range between 15 and

43 years. A significant portion, 61.1%, of the patients were transferred from other healthcare facilities. Full-term pregnancies accounted for 44.2% of the cases. The average birth weight was recorded at 2154 ± 543 g. In 26.3% of the cases, the RPH was classified as grade IIIB according to the Sher classification. The mean haemoglobin level was measured at 8.5 ± 2.5 g/dl. Patient characteristics are presented in Table 1.

Table 1. Patient characteristics (n = 95).

Variables	Numbers	Percentages
• Age		
○ ≤30 years	73	76.8
○ >30 years	22	23.2
• Status socio-professional		
○ Housewife	57	60.0
○ No housewife	38	40.0
• Residence		
○ City of Ouagadougou	85	89.5
○ Other residence	10	10.5
• Marital status		
○ Marital life (married or cohabiting)	82	86.3
○ Single	13	13.7
• Blood group		
○ O	51	53.7
○ Other than O	44	46.3
• Hospital admission procedure		
○ Evacuated	58	61.1
○ Referred	25	26.3
○ From within	12	12.6
• Time of year on admission		
○ Hot or cold weather	51	53.7
○ Other period	44	46.3
• Gravidity		
○ Primigravida	31	32.6
○ No primigravida	64	67.4
• Gestational age		
○ <37 weeks of amenorrhea	53	55.8
○ ≥37 weeks of amenorrhea	42	44.2
• Preeclampsia		
○ Yes	40	42.1
○ No	55	57.9

Continued

• Sher classification on admission		
○ Grade I	4	4.2
○ Grade II	36	37.9
○ Grade III A	30	31.6
○ Grade III B	25	26.3
• Haemoglobin level		
○ ≥8 g/dl	54	56.8
○ <8 g/dl	41	43.2
• Delivery mode		
○ Vaginal route	22	23.2
○ Caesarean section	73	76.8
• Stillbirth?		
○ Yes	57	60.0
○ No	38	40.0
• Sex of newborn		
○ Male	46	48.4
○ Female	49	51.6

3.3. Prognostic Factors

3.3.1. Factors Associated with Stillbirth

In the univariate analysis, several factors were found to be significantly associated with stillbirth. Specifically, being a housewive was associated with a high risk of stillbirth ($p < 0.001$). Additionally, the transfer from another healthcare facility (moving from primary or secondary to tertiary care) was another significant factor ($p = 0.009$). Notably, women who were not primigravida also exhibited an increased risk ($p = 0.042$). Furthermore, the sex of the fetus was linked to stillbirth, with male fetuses having a higher likelihood of occurrence ($p = 0.025$). In the multivariate analysis, several factors remained significantly associated with stillbirth. Being a homemaker was linked to an adjusted odds ratio (OR) of 4.24 (95% CI: 1.54 - 12.38). Additionally, the transfer from another healthcare facility was associated with an adjusted OR of 3.49 (95% CI: 1.20 - 11.05). Furthermore, the sex of the fetus also exhibited a significant association, with male fetuses presenting an adjusted OR of 3.56 (95% CI: 1.27 - 10.91) (Table 2).

Table 2. Factors associated with stillbirth.

Variables	Number of newborns	Stillbirths n (%)	ORb (IC 95%; p)	ORa (IC 95%; p)
• Age				
○ ≤30 years	73	45 (61.6)	1	1
○ >30 years	22	12 (54.5)	0.75 (0.28 - 1.99, p = 0.552)	0.91 (0.26 - 3.18, p = 0.882)

Continued

• Statut socio-professionnel				
○ Housewife	57	43 (75.4)	5.27 (2.20 - 13.24, **p < 0.001)**	4.24 (1.54 - 12.38, p **= 0.006)**
○ No housewife	38	14 (38.8)	1	1
• Marital status				
○ Marital life	82	52 (63.4)	1	1
○ Single	13	5 (38.5)	0.36 (0.10 - 1.18, p = 0.097)	0.53 (0.11 - 2.42, p = 0.409)
• Blood group				
○ O	51	28 (54.9)	0.63 (0.27 - 1.44, p = 0.276)	0.50 (0.17 - 1.42, p = 0.202)
○ Other than O	44	29 (65.9)	1	1
• Hospital admission procedure				
○ Evacuated	58	41 (70.7)	3.17 (1.35 - 7.64, **p = 0.009)**	3.49 (1.20 - 11.05, **p = 0.026)**
○ Not evacuated	37	16 (43.2)	1	1
• Time of year on admission				
○ Hot or cold weather	51	29 (56.9)	0.75 (0.33 - 1.72, p = 0.502)	0.90 (0.32 - 2.52, p = 0.843)
○ Other period	44	28 (63.6)	1	1
• Gravidity				
○ Primigravida	31	14 (45.2)	1	1
○ No primigravida	64	43 (67.2)	2.49 (1.04 - 6.08, **p = 0.042)**	2.02 (0.67 - 6.30, p = 0.217)
• Gestational age				
○ <37 weeks of amenorrhea	53	33 (62.3)	1	1
○ ≥37 weeks of amenorrhea	42	24 (57.1)	0.81 (0.35 - 1.85, p = 0.613)	0.66 (0.22 - 1.94, p = 0.454)
• Preeclampsia				
○ Yes	40	21 (52.5)	0.58 (0.25 - 1.34, p = 0.205)	0.53 (0.18 - 1.49, p = 0.233)
○ No	55	36 (65.5)	1	1
• Haemoglobin level				
○ ≥8 g/dl	54	29 (53.7)	1	1
○ <8 g/dl	41	28 (68.9)	1.86 (0.80 - 4.42, p = 0.153)	1.24 (0.43 - 3.61, p = 0.691)
• Sex of newborn				
○ Male	46	33 (71.7)	2.64 (1.14 - 6.33, **p = 0.025)**	3.56 (1.27 - 10.91, **p = 0.019)**
○ Female	49	24 (49.0)	1	1

Three maternal deaths were recorded, representing a lethality of 3.2%.

3.3.2. Factors Associated with a Maternal Haemoglobin Level Below 8 g/dl

The factor associated with maternal severe anaemia, defined as haemoglobin levels < 8 g/dl, is the occurrence of RPH in women without preeclampsia. In the univariate analysis, this association was statistically significant, with a p-value of 0.010. In the multivariate analysis, the adjusted odds ratio (OR) was found to be 3.18 (95% confidence interval [CI] = 1.28 - 8.34, p = 0.015), indicating a markedly increased risk of maternal anaemia under these conditions (Table 3).

Table 3. Factors associated with a maternal haemoglobin level below 8 g/dl.

Variables	Number of newborns	Haemoglobin < 8 g/dl n (%)	ORb (IC95%; p)	ORa (IC95%; p)
• Age				
○ ≤30 years	73	31 (42.5)	1	1
○ >30 years	22	10 (45.5)	1.13 (0.43 - 2.95, p = 0.804)	0.93 (0.30 - 2.78, p = 0.901)
• Status socio-professional				
○ Housewife	57	26 (45.6)	1.29 (0.56 - 2.99, p = 0.554)	0.98 (0.35 - 2.70, p = 0.962)
○ No housewife	38	15 (39.5)	1	1
• Marital status				
○ Marital life	82	37 (45.1)	1	1
○ Single	13	4 (30.1)	0.54 (0.14 - 1.80, p = 0.337)	0.89 (0.20 - 3.48, p = 0.864)
• Blood group				
○ O	51	21 (41.2)	0.84 (0.37 - 1.90, p = 0.675)	0.74 (0.29 - 1.85, p = 0.520)
○ Other than O	44	20 (45.5)	1	1
• Hospital admission procedure				
○ Evacuated	58	28 (48.3)	1.72 (0.74 - 4.10, p = 0.209)	1.45 (0.53 - 4.03, p = 0.464)
○ Not evacuated	37	13 (35.1)	1	1
• Time of year on admission				
○ Hot or cold weather	51	21 (41.2)	0.84 (0.37 - 1.90, p = 0.675)	0.87 (0.35 - 2.13, p = 0.760)
○ Other period	44	20 (45.5)	1	1
• Gravidity				
○ Primigravida	31	11 (355)	1.60 (0.67 - 3.98, p = 0.295)	1.22 (0.44 - 3.51, p = 0.702)
○ No primigravida	64	30 (46.9)	1	1
• Gestational age				
○ <37 weeks of amenorrhea	53	19 (35.8)	1	1
○ ≥37 weeks of amenorrhea	42	22 (52.4)	1.97 (0.87 - 4.55, p = 0.108)	2.09 (0.82 - 5.48, p = 0.125)
• Preeclampsia				
○ Yes	40	11 (27.5)	1	1
○ No	55	30 (54.4)	3.16 (1.35 - 7.81, **p = 0.010)**	3.18 (1.28 - 8.34, p = **0.015**)
• Stillbirth				
○ Yes	57	28 (49.1)	1.86 (0.80 - 4.42, p = 0.153)	1.31 (0.46 - 3.81, p = 0.617)
○ No	38	13 (34.2)	1	1
• Sex of newborn				
○ Male	46	22 (47.8)	1.45 (0.64 - 3.30, p = 0.374)	1.66 (0.66 - 4.26, p = 0.283)
○ Female	49	19 (38.8)	1	1

4. Discussion

The investigation conducted at the Yalgado Ouédraogo University Hospital pro-

vides significant insights into the burden and characteristics of retroplacental haematoma (RPH) within a specific West African tertiary care setting. The reported frequency of RPH at 1% aligns closely with findings from a contemporaneous study at Bouaké University Hospital in neighbouring Côte d'Ivoire, which documented an incidence of 0.96% [9]. This figure sits within the range observed in other African nations, such as the 1.71% prevalence noted in Enugu, Nigeria [10], although it remains lower than rates reported from certain centres in Senegal, which have reached up to 4.2% or even 6% in specific regional studies, potentially reflecting differences in classification, population characteristics, or referral patterns [11]. However, it is considerably higher than the 0.25% - 0.5% typically cited in high-income countries like France [12]. The observed lethality rate of 3.2% underscores the severe impact of RPH, particularly in resource-constrained environments where access to comprehensive emergency obstetric care, including timely blood transfusions and surgical intervention, may be limited [13]. For clinical practice, these figures emphasise the critical need for high vigilance, rapid diagnostic pathways, and readily available emergency obstetric services in centres managing such high-risk pregnancies, recognising RPH as a life-threatening emergency for both mother and fetus [9] [14].

The multivariate analysis isolating risk factors for stillbirth revealed crucial associations with significant clinical implications. The substantially increased risk associated with homemaker status (adjusted OR 4.24) likely reflects underlying socioeconomic vulnerabilities. This resonates with findings from Mulago Hospital, Uganda, where low socioeconomic status, indicated by housing quality, was a powerful predictor of severe abruptio placentae (OR 10.5) [15]. Furthermore, studies in Nigeria have highlighted that a majority of women presenting with placental abruption had not received antenatal care (ANC), suggesting barriers related to access or health-seeking behaviour, potentially linked to socioeconomic factors [10]. A systematic review also identified unmarried status and inadequate prenatal care as independent risk factors for placental abruption [16]. The clinical implication is the necessity for targeted antenatal support and health education programmes focusing on socioeconomically disadvantaged groups to improve awareness, encourage timely ANC attendance, and mitigate risks associated with delayed presentation or inadequate care [10] [15]. The association between homemaker status and stillbirth risk in retroplacental hematoma (RPH) cases reflects a multifaceted interplay of socioeconomic and healthcare access factors rather than a direct causal relationship. While the Yalgado Ouédraogo study identified homemaker status as a significant predictor of stillbirth (adjusted OR 4.24), this occupational classification likely serves as a proxy for underlying vulnerabilities.

Similarly, the finding that transfer from another healthcare facility significantly increased the odds of stillbirth (adjusted OR 3.49) points towards the dangers of delayed definitive management. Tertiary centres like the one in this study, as well as those in Enugu and Kolda, often receive complex referred cases, potentially contributing to higher observed complication rates [10] [11]. Delays inherent in

the referral process can worsen outcomes, particularly for a time-sensitive condition like RPH [13]. Clinically, this highlights the urgent need for streamlined referral protocols, improved inter-facility communication and transport, and potentially decentralising aspects of emergency obstetric care to minimise delays and ensure women receive timely, life-saving interventions [11] [13].

The association identified between male fetal sex and stillbirth (adjusted OR 3.56) adds to a complex body of evidence. While some large systematic reviews have not consistently identified male sex as an independent risk factor across all populations [16], the finding in this study warrants attention. However, this corroborates with findings from previously published studies indicating that male fetuses are consistently at greater risk for stillbirth and other adverse outcomes. For instance, McClure *et al.* (2007) conducted a meta-analysis that revealed significant disparities in risks associated with fetal sex, emphasizing a higher vulnerability among male fetuses [17]. Pathophysiological differences related to fetal sex in response to hypoxic stress or placental function could underlie this observation, though mechanisms remain incompletely understood. Clinicians managing pregnancies complicated by RPH might consider fetal sex as one component within a broader risk assessment, although further research is needed to clarify its predictive value and clinical utility.

A particularly noteworthy finding is the strong association between RPH not related to pre-eclampsia and severe maternal anaemia (haemoglobin < 8 g/dl), with an adjusted OR of 3.18. This underscores that significant RPH can occur and lead to substantial blood loss even in the absence of hypertensive disorders. Anaemia itself (defined as Hb < 11 g/dL) is recognised as an independent baseline risk factor for placental abruption [16]. Furthermore, severe haemorrhage is a hallmark complication of RPH, frequently necessitating blood transfusion, as observed in the Bagalkot study where 21% of abruption cases required transfusion for severe anaemia [9] [13] [14]. The clinical imperative arising from this finding is twofold: firstly, rigorous screening for and management of anaemia throughout pregnancy is essential, as anaemia can worsen maternal tolerance to haemorrhage; secondly, clinicians should maintain a high index of suspicion for RPH in severely anaemic pregnant women presenting with relevant symptoms, even if normotensive, ensuring prompt investigation and management to prevent catastrophic blood loss [13] [16].

The management of RPH fundamentally relies on prompt diagnosis, resuscitation, and delivery [14]. Traditional principles emphasise early delivery, often via caesarean section if the fetus is alive and viable, adequate blood product replacement guided by clinical status and coagulation parameters, pain relief, and intensive maternal-fetal monitoring [14]. Even if the fetus has demised, prompt delivery, typically vaginal induction if feasible, is pursued to control haemorrhage and prevent further maternal complications like coagulopathy or postpartum haemorrhage [14]. Multidisciplinary care involving obstetricians, anaesthetists, haematologists, and neonatologists is often required, particularly in severe cases [11].

Ensuring the availability of blood products and access to surgical facilities are critical components of preparedness in any unit managing obstetric emergencies [13].

Beyond the immediate clinical event, the pathophysiology of placental abruption is increasingly understood to involve complex molecular and immunological processes at the maternal-fetal interface [18]. Research highlights disruption of immunological balance, features of chronic inflammation, and potentially the role of inflammasomes like NLRP7 in the decidua and trophoblast cells, processes which may be influenced by factors like hypoxia [18]. While numerous clinical risk factors are known, including previous abruption (a major risk factor for recurrence), maternal age, multiparity, smoking, hypertension, pre-eclampsia, previous caesarean section, trauma, and substance use, RPH can still occur unpredictably [9] [15] [16] [19]. This complex pathophysiology implies that predicting RPH remains challenging [13], and clinicians must remain vigilant. Furthermore, distinguishing between retroplacental and intraplacental haematomas may be clinically relevant, as some evidence suggests differing risk profiles, with intraplacental haematomas potentially associated more with placental insufficiency and growth restriction, while retroplacental haematomas are strongly linked to fetal death [20].

5. Conclusion

This study of retroplacental haematoma (RPH) at the Yalgado Ouédraogo University Hospital highlights the serious implications of this obstetric complication, particularly in resource-limited settings. The results show that the incidence of RPH is high, with very high maternal and stillbirth rates. Identifying prognostic factors such as the mother's professional status, obstetric history and foetal sex is crucial to optimising outcomes for both mother and foetus. The study highlights the urgent need to improve diagnostic procedures, ensure timely referral and improve maternal emergency care services. Recognition of RPH as a critical emergency may facilitate better preparation and ultimately save lives, underlining the importance of ongoing research and clinician vigilance in the management of these high-risk pregnancies.

Conflicts of Interest

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

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