

Contribution to the Study of Hemorrhages in the Third Trimester of Pregnancy, Etiology and Management

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Abstract

Third trimester bleeding is a common concern in obstetrics. The main objective of this work was to study the management of hemorrhages in the third trimester of pregnancy in the maternity ward of the Sominé Dolo hospital in Mopti. Our prospective descriptive cross-sectional survey type study conducted at the maternity ward of Sominé Dolo hospital in Mopti over a period from January 1, 2017 to December 31, 2017 included 94 cases collected. During this period we had performed 1485 deliveries including 94 cases of pregnancies complicated by 3rd trimester hemorrhage, a frequency of 6.33%. The main cause of hemorrhage in the third trimester was represented by placenta previa 42.6% followed by retroplacental hematoma 28.7%, uterine rupture 26.6% and association Placenta previa and retroplacental hematoma 2.1%. The type of intervention depended on the cause of the hemorrhage and the maternal and fetal condition. More than half of the cases of uterine rupture 52% had benefited from a hysterorrhaphy during a laparotomy (n = 13/25) against 48% from hysterectomy (n = 12/25). Caesarean section was performed in 87.5% (n = 35/40) against 12.5% vaginal delivery (n = 5/40) in case of placenta previa. In the end, in 74% of cases (n = 20/27) of retroplacental hematoma, first-line cesarean section was performed. The maternal prognosis was represented by a mortality rate of 12% (n = 11/94) and morbidity dominated by hypovolemic shock 48.9% (n = 22/94), infections 28.8% (n = 13/94) and coagulopathy 11.1% (n = 5/94). The fetal prognosis was very poor. More than half (55%) of the newborns had succumbed against 45% of the newly

born. In 55.3% of cases neonatal mortality occurred antenatally. Neonatal morbidity was represented by prematurity, *i.e.* 20.2% (n = 19/94) and low birth weight, *i.e.* 22.3% (n = 21/94).

Keywords

Hemorrhage, Pregnancy, 3rd Trimester, Management, Prognosis

1. Introduction

Third trimester hemorrhage is external bleeding through the vagina during the third trimester of pregnancy. It occurs in less than 5% of pregnancies and constitutes an obstetric emergency with a risk of maternal and fetal morbidity and mortality. The urgency is first to assess the bleeding and its maternal-fetal impact and to stabilize the general condition before looking for an etiology [1].

Thus, in France, third trimester hemorrhage represented immediate postpartum hemorrhage as the first cause of maternal death with a rate of 17% and for the same period in the United Kingdom and the United States the 4th cause of death with a rate of 5% [2] [3].

The incidence of bleeding during the third trimester of pregnancy varies from 3% to 5% in developed countries: in France, AYOUBI noted 5% in 2000. In LONDON, a study carried out by DEREK in 1981 found a rate ranging from 3 to 6% [2] [3] [4].

In Africa, Akpovi in Benin noted a lower rate of 2.42% [5].

In Mali, a study carried out at the Gabriel Touré University Hospital Center by F Kané concluded at a rate of 2.6%, or 67 cases of hemorrhage in the third trimester of pregnancy out of a total of 2568 deliveries carried out in this hospital. This same author finds that bleeding during the third trimester of pregnancy represents 18.7% of the causes of maternal death with respective maternal and fetal lethality rates of 4.54% and 5.57% [6] [7] [8] [9] [10].

In 2009 at the Sominé Dolo hospital in Mopti, they represented the 2nd cause of maternal death after eclampsia, and the first cause in 2008 with postpartum haemorrhages [11].

These hemorrhages of the third trimester of pregnancy are not only a daily concern in current obstetric practice but also they encompass a range of obstetric pathologies (placenta previa, retro-placental hematoma and uterine rupture) whose delay in management could be detrimental to mother and fetus.

However, their brutal nature, the insufficiency and/or the lack of prenatal follow-up, the delay and/or the absence of a diagnosis, the insufficiency or the unavailability of the means of resuscitation (blood and blood products) confer on the hemorrhages of the third quarter all their severity.

In Mali, even if the free caesarean section had greatly improved the prognosis of these haemorrhages, it was clear that at the Sominé Dolo hospital in Mopti, the only 2nd level reference structure, haemorrhages in the third trimester of

pregnancy constituted in 2017 a public health problem. The main objective of our work was to study the maternal-fetal prognosis of hemorrhage in the 3rd trimester of pregnancy in the maternity ward of the Sominé Dolo hospital in Mopti.

2. Material and Methods

Our study was conducted at the maternity ward of the gynecology-obstetrics department of the Sominé Dolo hospital in Mopti, which was the only 2nd level reference health structure of our national health pyramid in the 5th administrative region of the center of the country. Our study was a descriptive study of the cross-sectional survey type and extended over a period of 12 months from January 1, 2017 to December 31, 2017. The study population included all pregnant women with at least 28 weeks of amenorrhea admitted to the maternity ward of the Sominé Dolo hospital in Mopti during the study period. The inclusion criteria concerned any pregnant woman presenting with a hemorrhage in the 3rd trimester of pregnancy, admitted and cared for in our department during the study period. The non-inclusion criteria were all cases of haemorrhage in the 1st and/or 2nd trimester of pregnancy and all cases of immediate postpartum haemorrhage during the study period. The sample size was

$$n = \frac{(2\alpha)^2}{i^2} \times P \times Q$$

calculated according to the SCHWARTZ formula. n = sample size, or $z = 1.96$ (reduced deviation), $i = 5\%$ (accuracy), P = prevalence of hemorrhage in the third trimester of pregnancy in Mali [8]: $P = 2.7\% = 0.027$; $Q = 1 - P \rightarrow = 1 - 0.027 = 0.973$, $n = 40$. Data were collected from birth, caesarean section and comprehensive emergency obstetric and neonatal care registers (SONUC) using a validated individual survey form. The course of care was initiated once the diagnosis of hemorrhage in the 3rd trimester of pregnancy was made, namely: the installation of the patient; taking a safe venous line with a G 16 or G 18 catheter; a biological assessment relating to the hemoglobin level in emergency, a creatinemia, the hepatic transaminases; the request for an emergency obstetric ultrasound if necessary and an etiological search. The term of the pregnancy, the fetal viability were specified; the notion of labor or not. In the end the lung maturation was done by corticosteroids (celestene 4 mg) if necessary; an assessment of the impact of the haemorrhage on the general condition of the patient; a search for associated maternal pathology. The action to be taken depended on these different parameters. Our patients and their live newborns were monitored throughout the hospital stay. We grouped the variables into socio-demographic, clinical and therapeutic variables. Word processing was performed on World software from the Office 2016 suite. And the data collected was entered and analyzed using.

IBM SPSS version 22.0 software. The significance level was set at 0.05 and the confidence intervals at 95%. The operative definitions related to: Primigestia = 1

pregnancy, Paucigestia = 2 to 3 pregnancies; Multigeste = 5 to 6 pregnancies; Grand multigravesta > to 6 pregnancies, Nulliparous = 0, childbirth, Primiparous = 1 childbirth; Pauciparous = 3 to 4 deliveries; Multipara = 5 to 6 deliveries; Grand multipara > to 6 deliveries; Full term newborn = ≥ 37 weeks of amenorrhea, Premature = 28 - 36 weeks of amenorrhea. Cesarean in first intention = absolute cesarean, Cesarean in second intention = relative cesarean; Poor general condition was defined in our context by a state of shock with coma and or blood pressure less than or equal to 8/4 cm hg, hemoglobin level ≤ 6 g/dl, Glasgow score varying from 6 to 7; Fair general condition = blood pressure between 9/5 cm Hg and 10/6 cm Hg, hemoglobin level varying from 7 g/dl to 10g/dl with obtundation, Glasgow score varying from 9 to 12; General condition good: blood pressure $\geq 11/7$ cm Hg, hemoglobin level ≥ 11 g/dl, good conscience, Glasgow score varying from 13 to 15; Coma is defined as the suppression of alertness and consciousness; Obtundation: is the state of drowsiness interspersed with a period of consciousness with reduced attention and memory impairment; Severe anemia = hemoglobin level ≤ 6 g/dl.

Moderate anemia = hemoglobin level between 7 to 9 g/dl; Evacuation: reference carried out in an emergency context; Referral: Mechanism by which a health facility directs a case that exceeds its skills to a more specialized and better equipped structure outside of any emergency situation.

3. Results

In total, during our study period from January 1, 2017 to December 31, 2017, we collected at the obstetrics gynecology department of the Sominé Dolo hospital in Mopti 1485 deliveries including 94 cases of pregnancies complicated by 3rd trimester hemorrhages, *i.e.* a frequency of 6.33%.

The epidemiological profile consisted of a 20 - 35 year old age group which was the most represented (73.4%). In addition, the majority of the women were married (95.7%), living in rural areas (59.6%) and were housewives (95.7%). These data are presented in **Table 1** below.

About 1/4 of our patients had a non term pregnancy (23.4%) and about 2/3 (66.6%) of the patients had a more or less severe anemia. The main cause of hemorrhage was placenta previa (42.5%) followed by retroplacental hematoma (28.7%) and uterine rupture (26.6%). Maternal morbidity was marked by hypovolemic shock (48.9%) followed by infections (28.8%) and coagulopathy. This information is presented in **Table 2**.

Most of the patients had not had any prenatal consultation, *i.e.* 48% of the cases (**Figure 1**).

More than 8/10 (87.2%) of the patients had delivered by caesarean section, and the route of delivery and type of intervention depended on the condition of the mother and the fetus. The main causes of neonatal mortality were uterine rupture and retro placental hematoma with respectively 48.08% and 38.47% (**Table 3**).

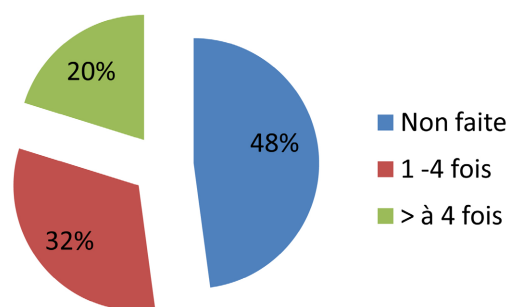


Figure 1. Distribution of patients according to the number of antenatal consultations.

Table 1. Distribution of patients according to socio-demographic characteristics.

Variables	Number	Percentage
Under 19 years	9	9.6
20 - 35 years	69	73.4
à 35 years	16	17.0
Total	94	100
Brides	90	95.7%
Singles	4	4.3
Total	94	100.0
Rural	56	59.6
urban	38	40.4
Total	94	100
Household	75	79.8
pupil/student	8	8.5
Saleswoman	10	10.6
Official	1	1.1
Total	94	100

4. Discussion

The limits of our study were: the absence of an ultrasound device in the delivery room for the etiological diagnosis and the problem of staffing the department with emergency drugs but also the insufficiency of blood products at the level of our laboratory lack of regular donors. Thus, these last factors had a serious impact on the adequate care of our patients.

In total from January 1, 2017 to December 31, 2017, we had collected 1485 deliveries including 94 cases of hemorrhage in the third trimester of pregnancy, *i.e.* a frequency of 6.3%. Similar studies conducted by other authors such as Kané F. [10], Sangaré D. [12] and Coulibaly Y. [13] had reported respective frequencies of 2.3%, 7.5% and 2.7% of cases. Our high frequency could be explained by the fact that the Sominé Dolo Mopti hospital was the only second reference health structure in the Mopti region, for this purpose the hospital received almost all

Table 2. Distribution of patients according to clinical characteristics.

Amenorrhea weeks	Effectifs	Pourcentage (%)
28 - 36	22	23.4
37 - 42	72	76.6
Total	94	100
Hemoglobin level		
à 11 g/dl	33	35.1
10 - 11 g/dl	21	22.3
7 - 9 g/dl	27	28.7
≤6 g/dl	13	13.8
Total	94	100
Etiology of hemorrhage		
Placenta previa (PP)	40	42.6
Retro placental hematoma (HRP)	27	28.7
Uterine rupture	25	26.6
PP + HRP	2	2.1
Total	94	100
Maternal morbidity		
Infections	13	28.8
Coagulopathy	5	11.11
Hypovolemic shock	22	48.9
Hemorrhage of deliverance	3	6.66
Anuria	2	4.44
Total	94	100
Maternal mortality		
Retro placental hematoma	7	64
Uterine rupture	3	27
Placenta previa + retroplacental hematoma	1	0.09
Total	11	100
Newborns by term of pregnancy		
Full-term newborns	75	79.8
Premature newborns	19	20.2
Total	94	100
Weight in grams Newborns according to birth weight		
Birth weight ≥2500 g = 73	77.7	
Birth weight <2500 g = 21	22.3	
Total 94	100	
Neonatal prognosis by etiology of hemorrhage		

Continued

Condition of newborns at birth according to etiology	New born alive		Stillborn	
	Number	%	Number	%
Placenta preavia (PP = 40)	35	83.33	5	9.61
Retro placental hematoma (HRP = 27)	7	16.67	20	38.47
Uterine rupture (25)	0	0	25	48.08
PP + HRP (2)	0	0	2	3.84
Total (94)	42	100	52	100

Table 3. Distribution of patients according to the appropriate surgical treatment.

Delivery route		Number	Percentage (%)	
low way		12	12.8	
High way		82	87.2	
Total		94	100	
Type of intervention in case of uterine rupture				
Hysterorrhaphy		13	52	
Hysterectomy		12	48	
Total		25	100	
Delivery route in case of placenta preavia				
Low way		5	12.5	
Ceasarean section		35	87.5	
Total		40	100	
Delivery route in case of retroplacental hematoma				
Childbirth labor Fetus	Caesarean section in 1st intention	vaginal delivery	Caesarean section in 2nd intention	Total
Living fetus and laboring woman	5	1	0	6
Fetus alive but woman not in labor	1	0	0	1
Dead fetus and woman in labor	5	4	2	11
Dead fetus and woman not in labor	9	0	0	9
Total	20	5	2	27
Bags		Amount of blood received by patients		
0		35	37.2	
2 - 3		44	46.8	
≥4		25	16.0	
Total		94	100	

the evacuees and referrals from the Community Health Centers and Center of Reference Health in the region. Our result sufficiently proved that hemorrhages in the third trimester of pregnancy were still relevant despite the progress made in the field of maternal and child health. The extreme ages were from under 19 to over 35 and the 20 - 35 age group was the most represented with 73.4% (n = 69) (**Table 1**). The most represented epidemiological profile was this woman rural, housewife and married with respectively 59.6%, 79.8% and 95.7% of cases (**Table 1**). The age group (20 - 35) most affected in our study 73.4% of cases. Coulibaly Y [13] in his study had reported a similar age group 19 to 35 years but at a lower proportion (52%) than that of our study (73.4%). The 19 - 35 age group would correspond to the optimal fertility period and the percentage difference could be related to the sampling. In our study, placenta previa was the main cause of these hemorrhages with 42.6% (n = 40) followed by retro placental hematoma 28.7% (n = 27), uterine rupture 26.6% (n = 25) and an association of placenta previa and retro placental hematoma 2.1% (n = 2) (**Table 2**). Our result was comparable to that of Coulibaly Y [13] in terms of etiological frequency of hemorrhages with respectively Placenta previa 42.2%, retroplacental hematoma 35.3% and uterine rupture 18.6% of cases. The factors associated with the high incidence of uterine rupture in our study compared to the literature would be mainly related to the three delays in the evacuation referral system. This would be the delay in making the decision to use local health structures, the delay in geographical accessibility, and the delay in receiving first aid at our community health centers (CSCOM). In addition to these delays, other factors may contribute to poverty, including the lack of access to local health facilities for prenatal consultations [14] [15] [16].

He also noted that 21.8% of bleeding in the third trimester of pregnancy was unexplained in his study. The indication for treatment depended on the etiology of the haemorrhage but also on the maternal-fetal state. Our caesarean section rate was 87.5% (35/40), which was much higher than that of IZRAR N [17] who reported 60% of cases in his study. This discrepancy could be related to the study methodology in terms of period duration and sample size (**Table 3**). Regarding uterine rupture, which represented a significant proportion in our study, 52% of our patients had undergone hysterorrhaphy against 48% hysterectomy for haemostasis. This high hysterectomy for haemostasis rate could be explained by the high morbidity linked to infections, hypovolemic shock and coagulopathy (**Table 3**). We deplored 11/94 cases of death, *i.e.* 12% maternal mortality in our study. This rate was much higher than those of IZRAR N. [17] 2% (2/110). Our high rate of maternal death would be related to the delay in referral-evacuation, transport difficulties due to isolation and the permanent non-availability of whole blood at the Sominé Dolo hospital in Mopti and above all the inability to extract fresh frozen plasma which is essential to correct coagulation disorders despite hysterectomy for haemostasis. In our specific case, the causes of these maternal deaths were retro placental hematoma 64% (n = 7/11), uterine rupture

27% (3/11) and ultimately the association of placenta previa and retroplacental hematoma 9% (1/11). The fetal prognosis, like that of the mother, was poor marked by prematurity and a high rate of neonatal deaths with respectively 22.3% (n = 21) and 55% of cases (n = 52). Our mortality rate was much higher than that reported by IZRAR N [17] which was 18.6%. Our high death rate would be related, as in the case of maternal death, to the delay in evacuation referrals.

5. Conclusion

It appears from our descriptive study of cross-sectional survey type that the main cause of bleeding in the third trimester of pregnancy was placenta previa 42.6% followed by retroplacental hematoma 28.7% and uterine rupture 26.6%. The maternal-fetal prognosis had been impacted by the late evacuations in relation to the difficult geographical accessibility of the region but also the severe lack of blood products for the management of these third trimester hemorrhages.

Authors' Contribution

Our thanks go to Tioukani Augustin Thera and Pierre Coulibaly who were the designers of our study. The questionnaire was developed and validated by these two authors. The drafting of the manuscript was done by Seydou Mariko. All authors have contributed substantially to the development of this work. All authors have read and approved the manuscript until submission.

Conflicts of Interest

The authors declare no conflict of interest.

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Survey Sheet

HEMORRAGIA OF THE 3rd TRIMESTERY OF PREGNANCY AT THE REGIONAL HOSPITAL OF MOPTI

FILE N°.....

1. IDENTIFICATION OF THE PATIENT

1) Date.....

Name First name

2) Ages a): less than 19 years old b): 20 - 35 years old c): more than 35 years old

Ethnicity a) peuhl b) dogon c) bozo d) sonrhaï e) bambara f) other

3) Residence a) rural b) urban

4) Profession a) housewife b) high school student c) saleswoman

d) civil servant e) other

5) Marital status

a) married b) single c) widow d) divorce

2. Mode of Admission

1) self-referred 2) evacuated

2) reason a): haemorrhage b): abdominal pain c): acute fetal distress d) other

3) origin a) csref b) 2 cscom c) home d) other

2 2 reference materials

a) partogram b) form c) a and b d) other

3) means of transport a) ambulance b) other to be specified

3. Background

1) Medical

a) hypertension b) diabetes c) hemoglobinopathy d) other

2) Surgical

a) caesarean section b) myomectomy c) heteroplasmy d) curettage e) other

3) Gynaecological Obstetrics

3 3 1 gynaecological a) menarche b) cycle character

b1) regular b2) irregular

c) dysmenorrhea d) pruritus

4) Obstetrical

a) gestational b) parity c) abortion

c1) spontaneous c) induced

d) number of caesarean sections e) number of curettages f) placenta previa g) retro placental hematoma h) uterine rupture i) other

4. Current Pregnancy

1) term of pregnancy a) preterm b) term c) postterm

2) prenatal consultation a) no b) yes c) if yes number to be specified d) place
d1) csref d2) cscom d3) hospital e) personnel e1) matron e2) midwife e3) gy-
naecologist e4) other

3) Event occurring during the pregnancy

a) hypertension b) edema c) diabetes d) proteinuria e) other previous bleeding

a) first trimester b) second trimester c) 3 third trimester

d) spontaneous e) induced f) if yes specify g) conduct to be avoided

g1) rest g1a duration g2) medical treatment

g2a) if yes, specify g2b) name g3) transfusion

g3a) if yes specify number of bags g3b) name

4) Prenatal check-up

A) biological check-up a) rhesus grouping b) blood count c) other

B) ultrasound 52 1 number of fetus

a) single b) twin c) triple

C) quantity of L A

a) normal b) hydramnios c) oligoamnios d) an amnios

D) ultrasound structure of the uterus

a) normal b) myomatous c) malformed

E) placental insertion

a) anterior a1) grade I a2) grade II a3) grade III

b) posterior b1) grade I b2) grade II b3) grade II

F) placental abruption

a) name b) yes c) if yes area of abruption

5. Welcome Table

Circumstances of occurrence

A) Time from onset of hemorrhage to consultation

a) 1 hour b) 2 hours c) 3 hours d) more than 4 hours

B) Bleeding a) minimal b) profuse c) severe

d) Spontaneous bleeding e) Bleeding on contact

C) Pain a) no pain b) presence of pain

D) Blood a) Bright red.....b) Blackish.....c)...Presence of clot.....

d) OTHER (please specify).....

6. Examination of the Patient

A) General condition a) good b) bad c) shock d) coma

B) T A b normal b high b low

C) conjunctiva a) colored b) pale

D) cervical status a) effaced b) not effaced

E) cervical dilatation a) nom dilated b) 1 to 3 cm c) 4 to 9 cm d) complete e)

other

F) pelvic status a) normal b) abnormal

G) presentation a) cephalic b) breech c) transverse

- H) fetal movements a) present b) absent
 I) BDCF a) 120 - 160 beats/min b) greater than 160 beats/min c) less than 160
 d) other

7. Additional Examinations

- A) BIOLOGICAL
 A) BLOOD
 a) Rhesus blood group b) Hemoglobin level c) Platelets d) Other
 e) blood sugar level d) other
 B) URINE
 a) Albumin b) Sugar
 C) IMAGERY
 Obstetrical ultrasound a) Fetal number b) Placental status
 c) grade d) placental abruption e) age d) other

8. Mode of Delivery

- vaginal delivery a duration of labor
 a) segmental cesarean section b) corporal c other

9. Diagnosis Retained

- A) PP: a) overlying b) name overlying c) lateral d) central e) marginal
 B) UTERINE RUPTURE: a) provoked.....b) spontaneous.....
 C) HRP a) clot weight b) cup in cm
 D) OTHER a specified

10. Therapeutical Attitude

- A) Bed rest...a) yes.....b) name....
 B) Artificial rupture membrane...a) name.....b) yes.....
 C) Medical treatment
 Colloidal crystals
 Transfusion
 a) no. of bags requested b) no. of bags honored
 c) missing by default c1 in lab c2 from donors c 3 other OXYTOCIN nbr am-
 poules
 Others to specify
 D) Caesarean section or suture of the uterus... a) name.....b) yes.....
 c) if yes, please specify
 E) Hemostasis hysterectomy:...a) yes.....b) name.....
 F) Other (please specify).....

11. Fetal Prognosis

- A) Living child.....a) Resuscitated.....b) Non-resuscitated.....c) APGAR at
 1st mN..... of APGAR at 5th min of APGAR at 10th min e other to specify.

- B) Premature baby a) name b) yes c) if yes term of pregnancy
- C) Parameters of the newborn a) Size b) Weight c) Sex
- D) Child transferred to pediatrics a) name b) yes c) if yes reason to specify duration of hospitalization
- E) Condition of the child at discharge from the paediatric ward: a) Satisfactory b) Died ... c) Other...
- F) Child died in utero a) Macerated b) Fresh

12. Maternal Prognosis

- A) Length of hospitalization: a) 1-4 days b) more than 4 days c) other
- B) Complications during hospitalization
 - a) Hypovolemic shock.....b) Infection.....f) Specified.....
 - c) Phlebitis... d) Pulmonary embolism.....e) DIC.....
- C) Death..... a) name b) Yes c) if yes circumstances of death.....
- D) Satisfactory condition a) Yes b) name c) if name specified
- E) Obstetrical prognosis a) Good b) Bad c) if bad to specify