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Maternal and Fetal Prognosis of Uterine Rupture in the Health District of Koutiala

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Abstract

Introduction: Uterine rupture is a complete or incomplete non-surgical continuity solution of the wall of the gravid uterus. Indeed, it is a Affection obstetrical condition whose maternal-fetal prognosis is poor in terms of morbidity and mortality. **Objectives:** To assess the risk factors for uterine rupture in the Koutiala Health District. **Methods:** This was a descriptive and analytical cross-sectional prospective collection study from January 1, 2019 to December 31, 2019, a 12-month period. In our study, all patients admitted to the maternity ward were included during the study period for which the diagnosis of uterine rupture was made. **Results:** Out of a total of deliveries, we recorded 27 cases of uterine rupture, a frequency of 1.04%. The average age of our patients was 32 years with extremes of 19 and 45 years. We notice 92.6% of uterine ruptures during the transfer. Almost 3/4 of our parturients were out of school 70.4% versus 11.1% in primary school and 18.5% in secondary school. The majority of patients affected by uterine rupture came from rural areas 85.2%. Only 14.8% were from Koutiala city. The admission time to the Koutiala Reference Health Centre was 2 hours 30 minutes in 50.85% of our patients with extremes of 15 minutes and 4 hours 30 min. The average parity was 6.30 - 3036; large multiparous accounted for 63% in our sample followed by multiparous 18.5%. As for pregnancy follow-up, 100% of the patients had not performed any prenatal consultations. In 85.2% hysterrhaphy was performed intervention and hysterectomy in 14.8%. Maternal prognosis was satisfactory in 96.30% of cases. From the point of view of morbidity: 1 case of

bladder-vaginal fistula was recorded and corrected by the bladder survey at home for 15 days. Late complications were the occurrence of anemia in 16 patients who were transfused and 1 case of phlebitis. We recorded 1 maternal death and 25 stillbirths. **Conclusion:** Uterine rupture is one of the leading causes of maternal and fetal mortality in Mali.

Keywords

Uterine Rupture, Maternal and Fetal Prognosis

1. Introduction

Uterine rupture is a serious obstetric accident, characterized by the presence of a partial or complete non-surgical continuity solution on a pregnant uterus [1]. This is a major surgical emergency involving maternal and especially fetal prognosis in the short term.

For the management of pregnancies and childbirth, the health system in Mali consists of a pyramid with four levels: I, II, III and IV. Thus from the base to the top, we have: First Level (I): CSCOM (Community Health Centre without operating theatre for pregnancy follow-ups and deliveries) and a dispensary; Second Level (II): CSRéf (Reference Health Centre with an operating theatre for dystocia deliveries and follow-up of pathological pregnancies); Third Level (III): Regional Hospitals; Fourth Level (IV): University Hospitals (CHU). This system includes: failures in health infrastructure that are insufficient and far from the reference health centre and therefore a centre with an operating theatre to perform caesarean sections in an emergency; poor road infrastructure resulting in a delay in evacuation and inadequacies in telecommunications as some areas with health centers are not covered by telephone networks or the network signal is bad.

These failures hinder the functioning of the health system with delays at all levels: delays in the community, delays in evacuation, delays in care at the health centre.

Despite Mali's reproductive health policy directions in recent years, including the organization of the referral/evacuation, the free caesarean section, this tragedy remains a reality in some localities such as Koutiala.

In the literature, currently uterine rupture is exceptional in developed countries. For example, in France, 3.8 uterine ruptures per 1000 or 0.038% of deliveries [2] are reported; in the USA, the incidence of uterine rupture is 0.07% [3], proving that this pathology is not inevitable. However, in developing countries like ours, the rate remains high.

In Africa, in a study conducted in Bouaké from 1996 to 2001 whose aim was to compare maternal-fetal characteristics and prognosis, the frequency of uterine rupture was 2.44% among women in the health security perimeter compared to 83.34% outside the perimeter with a lethality of 8.97% and 11.26% respectively

and a fetal mortality of 100% for women outside the perimeter [1].

As for Mali, at the Gabriel Touré Hospital-University Centre, a two-year study of childbirth in a scary uterus context found 0.7% uterine rupture [2].

A study carried out at our centre in Koutiala in 2010 reported a frequency of 1.66% or one uterine rupture per 60 deliveries over a period of 12 months [1].

In order to research the risk factors of pathology that has a high maternal and fetal mortality, to understand more than this study was initiated.

2. Objectives

To assess the risk factors for uterine rupture in the Koutiala Health District.

3. Materials and Methods

This was a cross-sectional, descriptive and analytical study with prospective data collection through an elaborate and informed questionnaire for each case of uterine rupture received and included in the study. From January 1, 2019 to December 31, 2019, a 12-month period. **The study population:** our study concerned all the parturients received in the delivery room of the obstetrics and gynecological department of the Koutiala health centre, whom they gave birth regardless of the delivery route. Sample sampling: the sample consisted of all cases of uterine ruptures diagnosed before, during labour or postpartum, during the study period and whose management took place in the ward.

Inclusion criteria: were included in our study, all cases of uterine rupture diagnosed and managed in the obstetric gynecology department of the Koutiala Reference Health Centre regardless of the anatomopathological type of uterine rupture. **The criteria for non-inclusion:** were not included in our study, limited tears or bursts of the cervix; wounds of the gravid uterus of traumatic origin; Uterine perforations during induced abortion; uterine ruptures outside of work. **Data collection:** the data sources were a questionnaire developed for each case of uterine rupture; Birth records prenatal check-in records and diaries; operating logs in the operating theatre; Hospitalization records technique: reading interviews with providers. The sampling was exhaustive. Were included in this study patients with uterine lesions that met the definition of a non-surgical continuity solution that is of interest in part or to the 3 tunics of the uterus.

Search limits: the difficulty of communication in areas not covered by a mobile telephone network requiring the technical directors of the centres to travel miles to be able to reach the reference health centre, the weak community organisation to support the village's parturients to access the community health centres or the reference health centre, the organisation of the referral/evacuation system to enable the rapid management of obstetric emergencies.

Data analysis and entry: data entry was done using Microsoft Word Office 2007 and analysis is done using SPSS 20.0 software.

The stast tests used are khi2 with p—5%. For the value 5, the Fischer was used to assess the relationships between the variables.

4. Results

Frequency: Out of a total of 2573 deliveries, we recorded 27 cases of uterine rupture, a frequency of 1.04%. The average age of our patients was 32 years with extremes of 19 and 45 years. All ages of the reproductive period were represented. The majority of our patients, 59.3%, were between 20 and 35 years old. We notice 92.6% of uterine ruptures during the transfer. The level of education: almost 3/4 of our parturients were out of school 70.4% versus 11.1% in primary and 18.5% in secondary school. **Origin:** The majority of patients affected by uterine rupture came from rural areas 85.2%. Only 14.8% were from Koutiala city. **Reference/Evacuation:** The majority of our patients 92.6% were referred or evacuated from the health facilities to the reference health centre (Table 1).

Admission time: is the time elapsed between the evacuation decision and the arrival at the reference health centre. This delay was reported in 27 patients. Most of the patients identified came from more than 85 km from Koutiala city. The admission time to the Koutiala Reference Health Centre was 2 hours 30 minutes in 50.85% of our patients with extremes of 15 minutes and 4 hours 30 min.

Parity: The average parity was 6.30 - 3036; large multiparous accounted for 63% in our sample followed by multiparous 18.5%. So in our series, all our parturients were illiterate. **Prenatal consultation:** As for pregnancy follow-up, 100% of patients had not performed any antenatal consultations. **The obstetrical basin:** The clinical study of the basin gives us a rate of 50.5% of normal basins and 6.1% of boundary basins and 43.4% of narrowed basins. Uterine height: 22 parturients or 81.5% had a uterine height greater than 36 cm and 18.5% or 5 parturients had a uterine height of less than 36 cm. For iatrogenic rupture, these are birth-related rupture (abuse of oxytocin, obstetric manoeuvre and uterine expression), oxytocin abuse accounts for 29.62% in our series, uterine expression accounts for 7.4% of ruptures. **Uterine scars:** With respect to surgical history 33.3% of patients had a history of caesarean section. **Vicious presentations:** Indeed, the history of cesarean section is usually due to dystocia caused by vicious presentations, so in our series we noted 12 cases.

The delivery pathway: Only one case of uterine rupture was found in the postpartum period. Compared to breakage types: we noted 92.6% complete rupture

Table 1. Distribution of maternal prognosis according to the admission mode.

Admission mode	Maternal state		Total (%)
	Dead (%)	Living (%)	
Evacuated	1 (5.9)	16 (94.1)	17 (63.0)
Referred	0 (0)	8 (100)	8 (29.6)
Come by herself	0 (0)	2 (100)	2 (7.4)
Total	**1 (3.7)**	**26 (93.1)**	**27 (100.0)**

Fisher exact test = 1.607; ddl = 2; p = 1.000.

versus 7.4 of incomplete rupture (Table 2).

Associated lesions: We noted a case of bladder lesion associated with uterine rupture. Surgical procedures: in 85.2% hystererraphia was the procedure performed and hysterectomy in 14.8% (Table 3).

The maternal prognosis: was satisfactory in 96.30% of cases. From a morbidity perspective: 1 case of vesico-vaginal fistula was recorded and corrected by the still survey for 15 days. Late complications were the occurrence of anemia in 16 patients who were transfused and 1 case of phlebitis. **In terms of maternal mortality and fetal mortality:** We recorded 1 maternal death and 25-dead-born (Table 4).

5. Discussion

During the count, 27 files met the definition uterine rupture, a frequency of 1.04%. These 27 files were used as work materials.

Epidemiological features

Frequency: In general, frequencies are much higher in poor countries than in highly medicalized countries. This frequency is in line with the magnitude of the

Table 2. Distribution of fetal prognosis according to the types of rupture.

Type of rupture	Newborn state		Total (%)
	Stillbirth (%)	Living (%)	
Complete	25 (100)	0 (0)	25 (92.6)
Incomplete	0 (0)	2 (100)	2 (7.4)
Total	**25 (92.6)**	**2 (7.4)**	**27 (100.0)**

Fisher exact test = 14.259; ddl = 1; p = 0.003.

Table 3. Distribution of patients according to the function of lesion associated, surgical procedure, and complications.

Lesion associated to UR	Number	Percentage
Yes*	1	3.7
No	26	96.3

Table 4. Distribution of patients according to maternal prognosis and the state of the newborn.

Maternal prognosis	Number	Percentage
Living	26	96.3
Dead	1	3.7
State of the newborn		
Living	2	7.4
Stillbirth	23	92.0
Stillbirth macerated	2	8.0

frequencies of uterine ruptures described in developing countries making uterine rupture a tragedy still common in these countries such as ours. Compared to a study conducted by Diakite I. [1] in the same center in 2010, we note a decrease in the frequency of cases of uterine rupture from 1.66% to 1.04% reported by ours. All ages of the reproductive period were represented. This fact has been found in many other authors [1] [2] [3] [4]. Educational attainment: An uneducated woman is less likely to seek professional care than her educated counterpart either because she is frightened and distraught in the foreign world of health services, or because she is not fully aware of the opportunities offered by health workers, these associated with insufficiency or lack of prenatal consultation are pejorative factors that promote the occurrence of uterine rupture. Thus in our series, almost 3/4 of our parturients were out of school. **Origin:** The majority of patients affected by uterine rupture came from rural areas or community health centres. Some of our community health centres are very far away from referral health centres with operating theatres for emergency caesarean sections. There is also the poor condition of the roads, the insufficient number of ambulances because there are sometimes two or three centres that call at the same time for often a single ambulance. As a result, many of its uterine ruptures come from rural areas.

Admission time: is the time elapsed between the evacuation decision and the arrival at the reference health centre. Most of the patients identified came from more than 85 km from Koutiala city. This corroborates the history of the African Society of Obstetrics and Gynecology [3] which revealed that more than half of the patients surveyed were more than 60 km. This shows that it takes some time before a woman in difficulty to give birth in a centre without an operating theatre before arriving at the center with an operating theatre. This means that a lot of breakage is done during the transfer to the center with operating theatre. Parity: Multiparity is a factor weakening the uterus was found in our study. Our predominance of multiparous was confirmed by authors such as Sanogo A C [5] which confirmed that the multiparous group accounted for 35.71% of cases, Ngbal R.N., Gauneft C.E., Koirokpi A. *et al.* [6]: multiparous accounted for 56.3%; Diallo F.B. [7] found 62% multiparous in a study conducted at Niamey Maternity in 1998. Indeed, the reduction of the inter-reproductive interval of less than 24 months, the multiparity, the weakening of the uterus by a previous scar, attempts to give birth at home could help to increase the frequency of uterine ruptures in our countries.

Prenatal consultation: As for pregnancy follow-up, none of our patients had performed a prenatal consultation. We know that prenatal consultation allows early detection of complications to prevent uterine ruptures. This measure must be put forward by our political authorities. Prenatal counseling is really a strategy for the development of birth plans to better organize deliveries. **The reference/Evacuation**: In our context or home birth is always done. Failures at home births play an important role in delays in evacuation to Level I or community

health centre without an operating theatre. the majority of our patients were referred or evacuated from these rural facilities without an operating theatre. However, our study did not find a significant stastistic link between the mode of admission and the maternal state (**Table 3**; Fisher—1607; ddl—2; p—1.000). Our rate is superimposed on those of Traoré Y. [8] in Mali or 93.3% and Drabo A. [9] in Mali or 84%. In addition, variable evacuation frequencies are reported in the literature. Uterine rupture occurred at 4 different levels: 10 cases in rural maternity or 40.0%; 9 cases in community health centres or 36.0%; 1 home case or 4.0%; 5 cases or 20% rupture during the transfer of the community health centre to the reference health centre. This shows that all of our cases of uterine rupture occurred before our parturients arrived at our reference centre. Caesarean section services should be close to populations. Lack of preparation for childbirth, lack of qualified personnel for the detection and early management of complications, the organization of the referral/evacuation system, un assisted deliveries, poor road infrastructure are elements that take into account.

The obstetrical pelvis: The clinical study of the pelvis is very important during prenatal consultation to detect pelvic abnormalities that indicate prophylactic caesarean section. Thus, these pregnants will be programmed for a cold cesarian. We have noted cases of uterine ruptures associated with pelvic abnormalities. **Uterine height:** Excessive uterine height should increase alertness and lead to an efficient reference or evacuation decision to a structure equipped with an operating theatre to avoid the drama of uterine rupture during labour. **Uterine scars:** The antecedents of surgical procedures involving the uterus, the tubes and other genitals are essential to take into account, so of the 27 cases of uterine ruptures 33.3% had a history of scarring uterus. This result is higher than that of Drabo A. [9] in Mali 24%, Sidibé M. [10] in Mali 20.8% of cases of scar uterus. Two antecedents of uterine rupture and 2 others had a history of myomectomy reported by our study corroborates with the literature. So Drabo A. [9] in Mali found 4%. Reduced intergesic appears to be an important factor contributing to poor histological recovery of the uterine muscle, weakening it as future pregnancies promote uterine rupture [5].

In the case of iatrogenic ruptures, these are ruptures related to the birth attendant (abuse of oxytocin, obstetric manoeuvre and uterine expression).

In our series, we noted 70.4% of spontaneous uterine ruptures on healthy uterus. This rate is lower than that of Vavdin F. [11] [12] in Rwanda 88% in 1983 and higher than those of El Kady A. [13] in Egypt 57.14% in 1993, Diakité M. [13] in Mali 36.5% in 1985. In our series, the cases of rupture were explained by the delay in decision-making to the healthy family to bring the parturients to the center, attempts at home birth, the misuse of oxytocin and uterine expression. Vicious presentations: indeed, the history of cesarean section is usually due to dystocies caused by vicious presentations, so in our series we noted 12cas. A pregnancy followed with a 3rd trimester ultrasound to detect these vicious presentations is necessary and in order to indicate a scheduled caesarean section.

Delivery pathway: Only one case of rupture was found in the postpartum. Our study finds a privilege between the pathway and the condition of newborns. There is an important privilege between the type of break-up and the condition of the newborn (Table 4, Fisher—14259; ddl—1; p—0.003). Asso**ciated lesions:** We noted a case of bladder lesion associated with uterine rupture. Diakité Y. [2] in the series at the reference health center of the commune V of Bamako found 1 case of bladder lesion or 0.7%.

Therapeutic and prognostic aspects

Surgical procedures: Several authors insist that the technique used must take into account certain considerations that are: the type of rupture, its direction, its delay, the general state of the patient, the age, the parity, the level of education, the technical plateau, the experience of the anaesthetist, the desire to procreate, the experience of the surgeon. We performed hystererraphia in 23 of our parturients and hysterectomy was performed in 4 cases.

Prognosis: From a morbidity perspective: 1 case of vesico-vaginal fistula was recorded and corrected by the still survey for 15 days. Late complications were anemia in 16 patients who were transfused and 1 case of phlebitis. **Maternal mortality:** Maternal prognosis was satisfactory in almost all of our patients, however our study reported a case of maternal decesions in a hypovolemic shock picture. Our rate is superimposed on that of El Mansouri A. [14] in Morocco or 0.5%; in 1995 and lower than those of Dolo A. [15] in Mali, or 9.5% in 1990 and Traore Y, Dolo A, Sy A S *et al.* [3] 6 deaths or 10.7%. **The future of obstetrics:** It is difficult for us to draw adequate conclusions because of the poor follow-up of the parturients and the failure to follow the instructions given by health workers after hospitalization. However, it should be remembered that of the 27 women operated on for uterine rupture, 23 who have received conservative treatment without tubal ligation are eligible for new pregnancies or 85.2%. Indeed, maternal survival is improved when post-operative follow-up is provided in a desirable way.

Fetal mortality: Fetal mortality associated with stopping the uterine-placental blood flow is significant. The fetal prognosis is catastrophic especially in Africa where parturients arrive late at the reference health centre at the confirmed rupture stage. Although fetal death rates vary, most African series report rates well above 50% and 80% [16] [17]. Fetal mortality is 25 stillbirths in our series or 93%. This rate is lower than that of Traore Y. [8] in Mali, or 84.1% in 1996. It is higher than those of Dolo A. [15] in Mali: 90.5% in 1990, of Lankoande J. [17] in Burkina Faso, 95% in 1997, Iloki H. [16] in Congo or 67.8% in 1994. The surviving newborns are the result of uterine ruptures under the seers, the fetus being still intrauterine and the placenta not taken off. These newborns number 2 or 7.4%.

6. Conclusion

Uterine rupture is a public health problem in Mali, where it is one of the leading

causes of maternal and perinatal mortality. Better screening of risk factors through quality prenatal consultations, early diagnosis and prompt and adequate management of patients will improve maternal and perinatal prognosis.

Conflicts of Interest

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

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