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Original article

Uterine rupture: Epidemiology, Risk Factors and Maternal-Fetal Prognosis at the Bougouni Reference Health Center

Rupture Utérine : Epidémiologie, Facteurs de Risque et Pronostic Materno-fœtal au Centre de Sante de Référence de Bougouni

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Résumé

Introduction : l'objectif de cette étude était d'étudier les aspects épidémiologiques, les facteurs de risque et le pronostic materno-fœtal de la rupture utérine dans l'unité de Gynécologie-Obstétrique du CSRéf de Bougouni

Méthodologie : Nous avons réalisé une étude cas-témoins allant du 1er Janvier au 31 Décembre 2019 dans l'unité de Gynécologie-Obstétrique du centre de Santé de Référence de Bougouni. Toutes les patientes prises en charge dans le service pour rupture utérine ont été incluses et deux témoins (accouchement par voie sans rupture) pour un cas (rupture utérine).

Les données ont été saisies et analysées sur le logiciel SPSS version 21. Le seuil de significativité a été fixé à 5%. L'association entre 2 variables qualitatives a été étudiée par le Chi².

Résultats : Au terme de notre étude nous avions enregistré 43 cas de rupture utérine sur un total de 1161 accouchements soit une fréquence de 3,7%. La moyenne d'âge des cas : 30,77 ± 2 ans avec des extrêmes de 18 et 40 ans contre 26,01 ± 1 ans pour les témoins avec des extrêmes de 14 et 42 ans. Quatre-vingt-quinze pourcents de nos patientes pour les cas n'étaient pas scolarisées contre 86% pour les témoins, 97% étaient des femmes au foyers contre 82% pour les témoins. Les facteurs de risque ont été dominés la cicatrice de césarienne(p=0,038) ; OR=2,99, le non suivi de la grossesse(p=0,002) et la résidence en milieu rural(p=0,000) et l'intervalle intergénésique ≤ 2ans (Khi-deux = 9,1735 ; p = 0,002). Le pronostic materno-fœtal est réservé avec 1 cas de décès maternel soit 2,3% et 28 cas décès périnatal soit 65,1%.

Mots-clés : Rupture utérine, Facteurs de risque, pronostic materno-fœtal, étude cas-témoins.

Abstract

Introduction: the objective of this study was to study the epidemiological aspects, risk factors and maternal-fetal prognosis of uterine rupture in the Gynecology-Obstetrics Unit of the CSRéf of Bougouni

Methodology: We carried out a case-control study from

January 1 to December 31, 2019 in the Gynecology-Obstetrics Unit of the Bougouni Reference Health Center. All patients treated in the uterine rupture department were included and two controls (delivery without rupture) for one case (uterine rupture).

The data were entered and analyzed on SPSS version 21 software. The significance threshold has been set at 5%. The association between 2 qualitative variables was studied by the Chi².

Results: At the end of our study, we had recorded 43 cases of uterine rupture out of a total of 1161 deliveries, i.e. a frequency of 3.7%. The average age of the cases: 30.77 ± 2 years with extremes of 18 and 40 years compared to 26.01 ± 1 years for controls with extremes of 14 and 42 years. Ninety-five percent of our patients for the cases were out of school compared to 86% for the controls, 97% were housewives compared to 82% for the controls. Risk factors were dominated: caesarean section scar (p=0.038); OR=2.99, non-follow-up of pregnancy (p=0.002) and residence in a rural area (p=0.000) and intergenerational interval ≤ 2 years (Chi-square = 9.1735; p = 0.002). The maternal-fetal prognosis is reserved with 1 case of maternal death (2.3%) and 28 cases of perinatal death (65.1%).

Keywords: Uterine rupture, Risk factors, maternal-fetal prognosis, case-control study.

Introduction

Uterine rupture (RU) is any non-surgical continuity solution of the gravid uterus. But the custom has prevailed to exclude those that concern only the cervix and those that are the result of an abortive maneuver [1]. Indeed, it is a serious obstetric condition with a poor maternal-fetal prognosis. Haemorrhage is the leading cause of death in the world and one of the main causes is uterine rupture [2]. Today, uterine rupture is rare in developed countries: in France one uterine rupture is reported for every 12,99 deliveries [3], in the United States of America (USA) one uterine rupture for every 16,849 deliveries [4], in China one uterine rupture for every 2,000 deliveries [5]. A recent study in Algeria in 2016 at the University Hospital (CHU) of Bejaia recorded 37 uterine ruptures out of 29,001 deliveries, i.e. a frequency of 0.128 [6]. Uterine rupture remains one of the main causes of maternal morbidity and mortality in third world countries, particularly in Mali [2]. In 2006, a qualitative study of the causes of maternal mortality in Bamako showed that uterine rupture is in second place, with a relative frequency of 20% of maternal deaths [7]. At the Gabriel Touré Hospital, it occupies fourth place with a frequency of 8.62% of cases of maternal death [8]. Uterine rupture is one of the main reasons for obstetric emergencies in the Gynaecology-Obstetrics Department of the "G" point hospital [9]. A 5-year study carried out at the CSRef of COMMUNE V reported a frequency of 139 uterine ruptures out of 37,276 deliveries, i.e. one uterine rupture for every 268 deliveries [10]. Uterine rupture has been the subject of several previous works in the form of articles and doctoral theses in medicine. Despite Mali's political orientations in terms of reproductive health in recent years, in particular free caesarean sections, this pathology remains a reality in some localities, particularly the areas furthest from the center. In Mali, several studies have been devoted to this subject, so in order to update the data in the literature and determine the risk factors for uterine rupture in a precise way in our circle, we initiated this study.

Methodology

This was a descriptive and analytical case-control study with retrospective data collection from January 01 to December 31, 2019, i.e. 12 months in the Gynecology-Obstetrics Unit of the Reference Health Center (CSRef) of Bougouni. The CSRef of Bougouni is a 1st level reference center according to the country's health pyramid. The gynecology and obstetrics unit of the CSRéf of Bougouni has a capacity of 22 hospital beds and carries out about one thousand (1000) deliveries per year. The study population included all births recorded in the unit during the study period. All

cases and controls meeting the criteria were included in our study: for cases, uterine ruptures diagnosed and treated in the department during the study period, for controls, patients admitted and treated in the department for vaginal delivery without uterine rupture. Not all cases and controls meeting the criteria were included: for cases, the RUs occurred and were cared for in other structures but seen in our department for other reasons. For witnesses, patients who have given birth vaginally in other departments and seen in our department for other reasons. Sampling was obtained on the basis of one case (uterine rupture) for two controls (vaginal delivery without uterine rupture) admitted after the cases. Data were collected retrospectively from the following media: Individual survey sheet, obstetric file, operative report register, delivery register, SONU register and hospitalisation register. The variables studied were, for quantitative variables (Age, Pregnancy, Parity, Blood Pressure, Pulse, Duration of Hospitalization) and qualitative variables (Sex, Occupation, Ethnicity, Menopause, Surgical History, Origin, Mode of Admission, State of Consciousness, Route of Delivery, Surgical Procedure Performed, Blood Transfusion, Fetal Prognosis, State at Discharge). Data collection was done by interviewing, reading documents and recording the information on the survey form. Data were captured and analyzed using SPSS Statisitics Version 22 software. The tables and graphs were made on Word and Excel office 2016. We used the Chi-square statistical test to compare our results with significance level $p < 0.05$.

Results

- *Frequency*

During the study period, we recorded 1161 deliveries, including 43 uterine ruptures, i.e. a frequency of 3.7%, or one uterine rupture for every 27 deliveries.

- *Socio-demographic characteristics*

The mean age of the cases was 30.77 ± 2 years with extremes of 18 and 40 years compared to 26.01 ± 1 years for controls with extremes of 14 and 42 years. Ninety-five percent of our patients for the cases were out of school compared to 86% for the controls, 97% were housewives compared to 82% for the controls. Uterine rupture occurred more in parturients living outside the city of Bougouni with 91% of cases compared to 9% for those living in the city. It was noted in parturients evacuated with 72%, referred with 18% and those who came on their own with 9% of cases.

- *Risk factors for uterine rupture.*

Table I: Univariate analysis of sociodemographic risk factors and prognosis for uterine rupture.

Risk factor	OR [IC]	Chi-square	Probability
Age≥ 35 years	6,33 [1, 52– 26,34]	7,2598	p < 0.007
Outside Bougouni city	12,9 [4,24 – 39,34]	26,92	p < 10-3
Evacuated/referred	25,67 [7,87 – 83,71]	43,471	p < 10-3
C-section ATCD	2,99 [1,03 – 8,68]	4,32	p = 0.038
Multiparous and large multiparous	9,63 [2,19 – 42,37] 10,0 [2,21 – 45,16]	10,4 10,4	P=0.001 P=0.001
IG≤ 2 years	4,16 [1,60 – 10,80]	9,1735	p = 0.002
No ANC	3,32 [1,54 – 7,11]	9,8612	p = 0.002
HU ≥ 36 cm	2,67 [1,10 – 6,52]	4,862	p = 0.027
Stillborn	14,19 [5,71 – 35,24]	38,956	p < 10-3
NNE Resuscitated	27,00 [6,38 – 114,2]	7,942	P=0.007

Table II : Distribution of patients according to associated lesions.

Associated lesions	Case (%)	Control (%)	Total (%)
No lesions	42 (97,7)	83 (96,5)	125 (96,9)
Bladder	1 (2,7)	0 (0)	1 (0,8)
Cervical	0 (0)	3 (3,5)	3 (2,3)
Total	43 (33,3)	86 (66,7)	129 (100,0)

Chi-square = 3.504; p = 0.100

Table III: Distribution of patients according to the postoperative evolution for the mother.

Postoperative evolution	Case (%)	Control (%)	Total (%)	OR [IC]
Simple	21 (48,8)	78 (90,7)	99 (76,7)	Ref 1
Complicated	22 (51,2)	8 (9,3)	30 (23,3	10,2 [3,98 – 26,20]
Total	43 (33,3)	86 (66,7)	129 (100,0)	-

Chi-square = 51.174; p < 10-3

Table IV: Distribution of patients according to maternal complications.

Maternal complications	Case (%)	Control (%)	Total (%)
Parietal Infection	2 (6,9)	0 (0)	2 (6,9)
Endometritis	4 (13,2)	0 (0)	4 (13,2)
Anaemia	16 (55,2)	4 (13,8)	20 (69)
Cervical tear	0 (0)	3 (10)	3 (10)
Total	22 (77,9)	7 (23,3)	29 (100,0)

Chi-square = 51.174; p < 10-3

Table V: Distribution of patients according to fetal prognosis.

Fetal prognosis	Case (%)	Control (%)	Total (%)	OR [IC]
Alive	15 (34,9)	76 (88,4)	91 (70,5)	Ref 1
Stillborn	28 (65,1)	10 (11,6)	38 (29,5)	14,19 [5,71 – 35,24]
Total	43 (33,3)	86 (66,7)	129 (100,0)	-

Chi-square = 38.956; p < 10-3

Discussion

- *Frequency*

The prevalence of rupture is high in our context. It varies according to the socio-economic development of countries. Our frequency is high and similar to that of Gan bai liu [11] in Niger and Fané K. [12] in Mali. This could be explained by the fact that our department has remained the only 1st reference structure for the entire circle, by the absence of ANCs, by the rural residence of our patients and by the short birth intervals. The reduction of uterine rupture requires the correct monitoring of the pregnancy, the creation of SONUB structures close to the villages and with easy access.

- *Sociodemographic characteristics*

The profile of our patients was that of a young woman aged (30.77 ± 2 years) or older, residing outside the city (90.7%), multiparous (30.2%), having not had any prenatal consultations (62.8%), referred/ evacuated in emergency (91.7%), with an interbirth interval less than or equal to 24 months (82.1%). The same characteristics have been found by Fane K. [12] and Kouakou P. [13] However, in our study, uterine rupture is not influenced by profession; education and marital status. The risk of uterine rupture increases with age but the difference is significant from (35 years of age). OR-[CI] = 6.33[1.52-26.34]. Age is an essential factor that impacts the occurrence of RU with a maximum risk from (35 years old). The majority of our RU cases have been in patients aged (35 years) and older. This fact could be explained by the great multiparity with uteruses that are fragile. In fact, this age is considered obstetrically unfavorable. When the residence is located far from the CSRef (outside the city of Bougouni) this was a risk factor for RU with OR-[CI] = 12.9 [4.24 – 39.34] and a p < 10-3, and could be explained by the fact that during the journey uterine rupture can occur, and the poor condition of the roads increases the evacuation time. This observation has been made by some authors [12, 13, 14, 15]. The absence of ANC is a risk factor in our study. This risk has been confirmed by the authors [15, 2, 16]. The number of prenatal consultations seems to us to be a necessary but not sufficient condition in the prevention of uterine ruptures. For Bohoussou [17], in addition to the number criterion, the quality criterion must be combined for a better effectiveness of prenatal surveillance in the prevention of uterine ruptures. These patients should be referred early to an obstetrical-surgical structure, especially in the case of coexistence of other risk factors such as multiparity and excessive uterine height. The predisposing factors for uterine rupture are, among others, the existence of a uterine scar present in 20.9% of the cases in our series. Camara S. [18] describes a rupture rate on uterine scar of 30.3% in his series. In developed countries, even if the treatment is optimal, the caesarean section scar is the leading cause of uterine rupture; 85% of the ruptures are attributable to it [19,13]. The birth interval was less than or equal to 2 years in 82.1%. This reduced inter-reproductive gap seems to be an important element contributing to poor histological recovery of the uterine muscle, weakening it over time, thus promoting uterine rupture [20, 21].

- *Prognosis*

The maternal prognosis for uterine rupture in our study was poor. It was marked by morbidity (51.2%) and mortality (2.3%). Anaemia was the main complication in 16 cases (55.2%) with the use of a blood transfusion in (37.2%). In the literature, the fetal prognosis is poor in the event of uterine rupture, especially in a healthy uterus. The fetal mortality of our cases was high (65.1%). This fact is explained by the acute fetal distress which is linked to the alteration of the utero-placental circulation. Among the 15 live newborns, 9 were found to require resuscitation (60%).

Conclusion

Uterine rupture is a serious, preventable obstetric complication that is common in our context. The risk factors were: residence in a rural area, scarred uteruses, absence of ANC, internatal interval less than or equal to 24 months. Uterine rupture affects the maternal and fetal prognosis and compromises

the obstetric future of parturients. A decrease in the frequency of uterine ruptures lies in the detection and management of dystocia, the correct monitoring of labor.

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Conflict of interest : None

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