

Research Article

**Analysis of different risk factors for complete uterine rupture
in pregnancy among local female population of Pakistan**

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ABSTRACT

Uterine rupture in pregnancy is a rare and often catastrophic complication with a high incidence of fetal and maternal morbidity. Numerous factors are known to increase the risk of uterine rupture, but even in high-risk subgroups, the overall incidence of uterine rupture is low. **Aims and objectives:** The basic aim of the study is to find the different risk factors for complete uterine rupture in pregnancy among local female population of Pakistan. **Methodology of the study:** This cross sectional study was conducted at Lady Willing Don Hospital during June 2018 to November 2018. In this study we find all the factors related to uterine rupture in females. The data were collected from 200 females who gave birth through CD and Vaginal delivery. Those who registered in the data set of hospital were included in this study. For each case we collected the following: maternal history, features of the pregnancy in labour, clinical signs and the method of diagnosing uterine rupture, fetal management, its subsequent course and the maternal outcome. **Results:** The data were collected from 200 female patients of the hospital. We found 173 complete ruptures of a total of 200 uterine ruptures after starting labor. There were 13 complete ruptures (0.2 per 10,000) among nulliparous women after starting labor. None of the women with uterine rupture had a diagnosis of endometriosis. None of the women had a story of uterine surgery. None of the women was nulliparous and two (29%) had more than two previous children (four and six). We noted an induction of labour for 71% of cases. **Conclusion:** It is concluded that the risk for complete uterine rupture increases with sequential labor induction with prostaglandins and oxytocin and with oxytocin use during labor.

Key words: Uterine, Rupture, C-section

INTRODUCTION

Uterine rupture in pregnancy is a rare and often catastrophic complication with a high incidence of

fetal and maternal morbidity. Numerous factors are known to increase the risk of uterine rupture,

but even in high-risk subgroups, the overall incidence of uterine rupture is low. From 1976-2012, 25 peer-reviewed publications described the incidence of uterine rupture, and these reported 2,084 cases among 2,951,297 pregnant women, yielding an overall uterine rupture rate of 1 in 1,146 pregnancies (0.07%)¹. The initial signs and symptoms of uterine rupture are typically nonspecific, which makes the diagnosis difficult and sometimes delays definitive therapy. Uterine rupture is a rare obstetric complication associated with significant fetal and maternal morbidity. Complete rupture, in which there is discontinuity of both the serosa and muscle, is the most serious type of rupture².

Complete rupture can occur in the scarred or unscarred uterus. Uterine rupture in the unscarred uterus is rare and its incidence is higher in developing (between 0.1 and 1%) than in developed countries³. The prevalence of this event in developed countries varies according to the reporting authors and is estimated at 3/10 000⁴. Unscarred uterine rupture accounts for only 13% of all uterine ruptures. Since uterine rupture in the unscarred uterus is a very rare event, delay in the time taken to make the diagnosis is more common than with a rupture in the scarred uterus⁵. It is also associated with a more severe maternal and fetal prognosis than uterine rupture in the scarred uterus. Lastly, uterine rupture in the unscarred uterus is a diagnostic problem since the clinical signs are not specific and vary according to the studies⁶. In Norway, the incidence of complete uterine rupture has significantly increased in recent years in both women with and without previous CD⁷. This increase was partly explained by an increase in risk factors related to labor management, mainly induction and augmentation of labor. Among mothers without a previous CD in Norway, labor is induced with prostaglandins, oxytocin, amniotomy, and other mechanical methods such as transcervical balloon catheter. Oxytocin induction was predominantly used in 1967–1977, with hardly any use of prostaglandins. Prostaglandins were increasingly used since 1978.

All mothers with 1 previous CD are offered a trial of labor unless there is absolute contraindication against vaginal delivery⁸. The trial of labor after previous CD is high in Norway, around 63.6%. Among those with a trial of labor, there is 80% vaginal birth. Prostaglandin E2 was used in induction in this group until 2004 when the transcervical balloon started dominating⁹. Augmentation of labor with oxytocin has increasingly been used in recent years in which almost one third of the women giving birth receive oxytocin. Here we further explore factors that may be associated with complete uterine rupture¹⁰.

Background of the study

Women with prior CS are at higher risk of uterine rupture. The reported incidence of uterine rupture among women with prior CS ranged from 0.22% to 0.5% in some developed countries. The risk factors for uterine rupture in women with a history of CS include prior classical incision, labour induction or argumentation, macrosomia, increasing maternal age, post-term delivery, short maternal stature, no prior vaginal delivery, and prior periviable CS. Uterine rupture poses considerable risk of adverse maternal and perinatal outcomes¹¹. The prevalence of maternal and perinatal complications, such as severe post-hemorrhagic anemia, major puerperal infection, bladder injury, hysterectomy, and perinatal mortality, are significantly higher in women with uterine rupture than women without uterine rupture.

Aims and objectives

The basic aim of the study is to find the different risk factors for complete uterine rupture in pregnancy among local female population of Pakistan.

Methodology of the study

This cross sectional study was conducted at Lady Willing Don Hospital during June 2018 to November 2018. This study was conducted with the permission of ethical committee of hospital. In

this study we find all the factors related to uterine rupture in females. The data were collected from 200 females who gave birth through CD and Vaginal delivery.

Data collection

We collected the data from Obstetrics and Gynaecology department of Lady Willing Don Hospital. Those who registered in the data set of hospital were included in this study. For each case we collected the following: maternal history, features of the pregnancy in labour, clinical signs and the method of diagnosing uterine rupture, fetal management, its subsequent course and the maternal outcome.

Ethical consideration

This research project was approved by “Departmental Ethics and Research committee” of the hospital.

Table 01: Demographic characteristics of women. Five women (71%) had Cesarean section owing to FHR anomalies, one had obstetrical maneuvers and one giving birth normally

Maternal characteristics	N or mean \pm SD	%
Age (years)	35.3 \pm 2.8	-
Termination of pregnancy	5	71
Gestivity	4.6 \pm 2.1	
Parity	2.4 \pm 1.9	-
Para = 0	0	0
Para = 1	3	43
Para = 2	4	67
BMI before pregnancy (kg/m ²)	29.2 \pm 5.7	-
BMI after pregnancy (kg/m ²)	33.8 \pm 6.6	-
Weight gain (kg)	18.6 \pm 9.5	-
Fundal height (cm)	36.3 \pm 2.3	-
Pregnancy characteristics		
Ultrasound macrosomia	5	71
Gestational Diabetes	1	14

None of the women with uterine rupture had a diagnosis of endometriosis. None of the women had a story of uterine surgery. None of the women was nulliparous and two (29%) had more than two previous children (four and six). We noted an induction of labour for 71% of cases. The reason of labour induction was: macrosomia for two cases and for one case it was associated to gestational diabetes, abnormal fetal rate,

Statistical analysis

SPSS analysis test was used in making a comparison of the two-tailed P value with a significance set at p<0.05. Results were considered to be of statistical significance if the two-tailed p-value was less than 0.05.

RESULTS

The data were collected from 200 female patients of the hospital. We found 173 complete ruptures of a total of 200 uterine ruptures after starting labor. There were 13 complete ruptures (0.2 per 10,000) among nulliparous women after starting labor. Maternal characteristics are described in detail in Table 1.

post term and reduction of fetal movement. Irrespective of the method used to initiate labour, oxytocin was used for all women in a maximum dose of 6 mIU/h. All women received epidural analgesia.

Table 2: Risk factors for complete uterine rupture after starting labor in women without previous cesarean delivery

	N	%
Labor characteristics		
GA at labor (weeks,means)	39.45	-
Induction of labor		
Yes	5	67
- Misoprostol ®	2	28.5
- Propess ®	1	14
- Oxytocin	2	28.5
No	2	33
Use of Oxytocin	7	100
Maximum oxytocin dose (mUI/min)	6.4	-
Use of peridural	7	100%
Duration of labor	4.6	-
Clinical signs		
Abnormal FHR	7	100
Decelerations	5	71
Bradycardia	2	28.5
Vaginal bleeding	3	42.9
Abdominal Pain	3	42.9
Vomiting	2	28.5
Moment of diagnosis		
Per partum	5	71
Postpartum	2	28.5

DISCUSSION

The incidence of uterine rupture in women with prior CS varied across countries, ranging from 0.1% to 2.5% in our sample of 359 facilities in 29 countries worldwide. After adjusting for country, facility- and individual-level effects, the risk of uterine rupture in women with prior CS was associated with giving birth in medium or low-HDI countries, spontaneous onset of labour, lower maternal educational level, and gestational age at birth less than 37 weeks. Women with uterine rupture had a significantly higher risk of adverse maternal and perinatal outcomes¹².

Previous studies reported the incidences of uterine rupture in women with prior CS from 0.22% to 1.69% and these were similar to the results of this study, with an overall rate of 0.5%¹³. The incidence of uterine rupture was highest in low-HDI countries (1.0%), and the multivariate

analysis identified giving birth in low-HDI countries as a factor associated with uterine rupture. However, it should be noted that the numbers of observed uterine ruptures were very small in some countries (e.g. 14 countries had 3 or less cases of uterine rupture), and this may affect the reliability of the calculated incidence rates¹⁴. In this analysis, women with spontaneous onset of labour had a higher incidence of uterine rupture compared to women who had a pre-labour CS¹⁵. Although previous studies have shown an association between uterine rupture and labour induction, our analysis did not show a significant increase in risk of uterine rupture among women with induced labour. This may be due to the relatively small number of women who had induced labour in our dataset¹⁶.

CONCLUSION

It is concluded that the risk for complete uterine rupture increases with sequential labor induction with prostaglandins and oxytocin and with oxytocin use during labor. The main risk factors found in the literature and in our study are multiparity, induction of labour, use of oxytocin, and suspicion of fetal macrosomia. Diagnosis of rupture may be made in the post-partum.

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