Rupture Uterus in a Tertiary Care Centre: A Descriptive Cross-sectional Study
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ABSTRACT

Introduction: Rupture uterus is an obstetric catastrophe with poor maternal and fetal outcome. The objective of the study is to determine the prevalence of rupture uterus in pregnancy.

Methods: This was a descriptive cross sectional study conducted in a tertiary care centre from January 2016 to December 2016 after taking ethical approval (Approval No. F-PMC 510/76/77) from Institutional Review Committee. Convenience sampling method was used. Data were entered in the Microsoft Excel sheet and obtained data was analysed using Statistical Package for Social Sciences version 18 software for central tendency and frequencies.

Results: Out of total 1559 deliveries, prevalence of rupture uterus was found to be 12 (0.77%). Previous lower segment caesarean scar rupture was the most common risk factor noted in 7 (58.3%) cases. A total of seven patients (58.3%) required intensive care unit admission and blood transfusion. Other maternal complications were surgical site infection 2 (16.67%), sepsis 2 (16.67%), paralytic ileus 1 (8.3%), pelvic collection 1 (8.3%) and vesico vaginal fistula 1 (8.3%). Two maternal deaths (16.67%) and perinatal death was noted in 8 (66.66 %) cases.

Conclusions: Rupture uterus most commonly occurred in scarred uterus. Identification of high risk pregnancy, judicious caesarean section, proper labor monitoring, early diagnosis and prompt management are essential in reducing its occurrences.

Keywords: caesarean section; maternal mortality; perinatal mortality; rupture uterus.

INTRODUCTION

Rupture of a gravid uterus refers to tear of the uterine muscle occurring during pregnancy, delivery, or immediately after delivery. 1 Various factors associated with increased risk of uterine rupture include previous caesarean section, uterine scars, uterine anomalies, grand multiparity, use of oxytocin, placenta percreta, low socioeconomic class, prolonged obstructed labor and delayed management of labor. 1, 2

Uterine rupture is more prevalent in less developed countries like Nepal. 2 It’s a life-threatening emergency resulting in maternal death (0-1% in modern developed nations and 5-10% in developing countries). 3 Here, primary rupture with more disastrous complications is common than scar rupture. However, the etiological trend is changing due to a rise in caesarean deliveries leading to uterine scars and future risk of rupture. 4

This study was conducted to determine the prevalence of ruptured uterus.

METHODS

This was a descriptive cross sectional study conducted in department of Obstetrics and Gynecology in National Medical College and Teaching Hospital, a tertiary level referral center in Central Terai region of Nepal with high number of obstetric cases. The duration of the study was one year from January 2016 to December 2016. Ethical approval was taken from the Institutional Review Committee (Approval No. F-PMC 510/76/77). All cases of complete and incomplete uterine rupture including scar dehiscence. Whole sampling method was used and minimum sample size was calculated using formula:

\[ n = \frac{Z^2 \times p(1-p)}{e^2} \]

where:

- \( n \) = sample size
- \( p \) = prevalence of rupture uterus, 50%
- \( q = 1-p \) = margin of error, 3%
- \( Z = 1.96 \) at 95% CI

The minimum sample size calculated was 1068 and sample of 1559 was taken. A proformed proforma was designed by investigators to record all the available demographic details and clinical parameters. Identification of all cases was done through the departmental obstetrics register before the case note files were retrieved. Case record file with diagnosis of rupture uterus were retrieved from the records department and information on maternal demographical characteristics, risk factors, induction or augmentation of labour, medical or surgical intervention, instrumentation, intravenous manipulation, maternal and perinatal outcome were recorded using a proforma. Perinatal and maternal outcomes of the cases were also reviewed. Every relevant information was entered in the Microsoft Excel sheet and obtained data was analysed using Statistical Package for Social Sciences version 18 software for central tendency and frequencies.

RESULTS

During the study period of one year from January 2016 to December 2016, out of total 1559 deliveries, prevalence of rupture uterus was found to be 12 (0.77%). The age range of patients was from 20 years to 35 years out of which 7 (58.3%) were of 20-25 years. Out of 12 cases, 10 (83.3%) were referred cases and only 2 (16.6%) were booked case of our hospital.

Table 1: Demographic and clinical characteristics (n=12)

| Characteristics  | n (%) |
|------------------|------|
| Age in years     |      |
| 20-25            | 7 (58.3) |
| 26-30            | 3 (25) |
| >30              | 2 (16.67) |
| Parity           |      |
| P1               | 8 (66.67) |

Table 2: Risk factors, characteristics and management of uterine rupture.

| Characteristics       | n (%) | Risk factors     | Characteristic     | Management                |
|-----------------------|-------|------------------|--------------------|---------------------------|
| Age in years          |       |                  |                    | Extension into broad      |
| 20-25                 | 7 (58.3) | Previous scar    |                   | Posterior wall             |
| 26-30                 | 3 (25)   |                   | Instrumental delivery | 2 (16.67) |
| >30                   | 2 (16.67) |                   | Mal-presentation     | 1 (8.3) |
| Parity                |       |                  |                   | Type of rupture            |
| P1                    | 8 (66.67) |                  |                   | Complete                   |
|                       |       |                  |                   | Incomplete                 |
|                       |       |                  |                   | Repair with sterilization  |
|                       |       |                  |                   | Obstetric hysterectomy     |

Various maternal complications following uterine rupture is presented in (Table 3). Seven (58.3%) cases required intensive care unit admission and blood transfusion. There were 2 (16.6%) cases each of surgical site infection and sepsis. There were 2 (16.6%) maternal deaths during the study period due hypovolemic shock. Perinatal mortality was seen


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Conclusions: Rupture uterus most commonly occurred in scarred uterus. Identification of high risk pregnancy, judicious caesarean section, proper labor monitoring, early diagnosis and prompt management are essential in reducing its occurrences.

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\[ n = \frac{Z^2 \times (p \times q)}{e^2} = \frac{1.96^2 \times (0.5 \times 0.5)}{0.03^2} = 1068 \]

where, 
- \( n \): sample size
- \( p \): prevalence of rupture uterus, 50%
- \( q \): 1 - p
- \( e \): margin of error, 3%
- \( Z \): 1.96 at 95% CI

The minimum sample size calculated was 1068 and sample of 1559 was taken. A preformed proforma was designed by investigators to record all the available demographic details and clinical parameters. Identification of all cases was done through the departmental obstetrics register before the case note files were retrieved. Case record file with diagnosis of rupture uterus were retrieved from the records department and information on maternal demographic characteristics, risk factors, induction or augmentation of labour, medical or surgical intervention, instrumentation, intratrane manipulation, maternal and perinatal outcome were recorded using a proforma. Perinatal and maternal outcomes of the cases were also reviewed. Every relevant information was entered in the Microsoft Excel sheet and obtained data was analysed using Statistical Package for Social Sciences version 18 software for central tendency and frequencies.

RESULTS
During the study period of one year from January 2016 to December 2016, out of total 1559 deliveries, prevalence of rupture uterus was found to be 12 (0.77%). The age range of patients was from 20 years to 35 years out of which 7 (58.3%) were of 20-25 years. Out of 12 cases, 10 (83.3%) were referred cases and only 2 (16.6%) were booked case of our hospital. The mean parity and gestational age were 2 and 38.4 weeks respectively. Uterine rupture was noted in term pregnancies between 37 weeks and 42 weeks in 11 (91.6%) cases and one preterm rupture occurred at 36 weeks’ gestation in the previously scarred uterus (Table 1).

| Age in years | Characteristics | n (%) |
|--------------|----------------|-------|
| 20-25        |                 | 7 (58.3) |
| 26-30        |                 | 3 (25)  |
| >30          |                 | 2 (16.67) |

Various maternal complications following uterine rupture is presented in (Table 3). Seven (58.3%) cases required intensive care unit admission and blood transfusion. There were 2 (16.6%) cases each of surgical site infection and sepsis. There were 2 (16.6%) maternal deaths during the study period due hypovolemic shock. Perinatal mortality was seen in 1 (8.3%) cases followed by subtotal hysterectomy in the remaining cases (Table 2).

Table 1: Demographic and clinical characteristics

| Characteristics | n (%) |
|----------------|-------|
| Characteristics | n (%) |
| Age in years   |       |
| 20-25          | 7 (58.3) |
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| >30            | 2 (16.67) |

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in 8 (66.67%) cases; among them seven were fresh stillbirth and one was early neonatal death (Table 4).

| Table 5: Maternal morbidity and mortality following ruptured uterus. | Variable | n (%) |
|---|---|---|
| Live birth | 4 (33.3) |
| Fresh Stillbirth | 7 (58.3) |
| Early neonatal death | 1 (8.3) |
| Perinatal mortality | 8 (66.67) |

**DISCUSSION**

Rupture of the gravid uterus leads to grave complications endangering the life of both the mother and baby. Despite its rarity, it still contributes to significant maternal and perinatal morbidity and mortality especially in the setting of developing countries like Nepal.

The prevalence of rupture uterus was 0.76% in our study which is higher than the prevalence reported in other studies. The prevalence of rupture uterine scar was 58.3% in our study. The prevalence of uterine rupture in our study may be due to the delay in referral with most women landing up in the maternity unit in hypovolemic shock. The prevalence of rupture in our study may be due to the delay in referral with most women landing up in the maternity unit in hypovolemic shock. The prevalence of rupture in our study may be due to the delay in referral with most women landing up in the maternity unit in hypovolemic shock.

Ten (83.3%) cases presented between the ages of 20-30 years and the mean parity was 2. Uterine rupture occurred in 11 (91.6%) in gravida 2-4 with only one patient being grand multipara. The age and parity distribution of our study were comatent with the findings of other studies. Unbooked status of the patient was found to be one of the significant factors associated with rupture uterus in a Nigerian study which was similar to the finding of our study in which 83.3% cases were unbooked. This reflects the substantial ignorance in the management of high risk cases and poor access to the tertiary health care center.

In our study, rupture of the previous caesarean scar accounted for 58.3% of rupture cases, followed by obstructed labor 16.6%, instrumental delivery 16.6% and malpresentation 8.3%. Other studies conducted in different sites in Nepal also showed previous caesarean scar rupture to be the most common cause of rupture with percentage being much higher (72.78%) than our study. 

**CONCLUSIONS**

Uterine rupture, often a preventable condition is a serious complication and a major contributor to maternal morbidity and neonatal mortality. Previous caesarean scar rupture is the most common cause of rupture. Promotion of skilled birth attendance, identification of high risk pregnancy, judicious caesarean section, cautious use of oxytocic drugs, proper labor monitoring and education about supervised pregnancy and institutional delivery are essential in reducing its occurrence.

**ACKNOWLEDGEMENTS**

We would like to thank all the faculties of Department of Obstetrics and Gynaecology, National Medical College and especially the interns Dr. Subash Rai, and Dr. Pratik Neupane for their help in conducting the study.

Conflict of Interest: None.

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in 8 (66.67%) cases; among them seven were fresh stillbirth and one was early neonatal death (Table 4).

Table 3. Maternal morbidity and mortality following ruptured uterus.

| Variable          | n (%)                        |
|-------------------|------------------------------|
| Pelvic collection | 1 (8.3)                      |
| Sepsis            | 2 (16.67)                    |
| Paralytic ileus   | 1 (8.3)                      |
| Pelvic collection | 1 (8.3)                      |
| Vesico-vaginal fistula | 1 (8.3)        |
| Prolonged hospital stay > 7 days | 7 (58.3) |
| Mortality         | 2 (16.67)                    |

Table 4. Perinatal outcome following uterine rupture

| Variable          | n (%)                        |
|-------------------|------------------------------|
| Live birth        | 4 (33.3)                     |
| Fresh Stillbirth  | 7 (58.3)                     |
| Early neonatal death | 1 (8.3)                 |
| Perinatal mortality | 8 (66.67)                  |

In our study, rupture of the previous caesarean scar accounted for 58.3% of rupture cases followed by obstructed labor 16.6%, instrumental delivery 16.6% and malpresentation 8.3%. Other studies conducted in different sites in Nepal also showed previous caesarean scar rupture to be the most common cause of rupture with percentage being much higher (72-78%) than our study.9,10 Sunanda N, et al. also concluded that separation of previous caesarean section scar was the commonest cause of rupture in their two-year analysis of uterine rupture in pregnancy in Mysore, India.11 This is due to the increasing trend of caesarean section in modern obstetrics. Lack of counseling for contraception, short inter-delivery interval, poor acknowledgement of the scarred uterus as a major risk factor, delay in diagnosis of rupture and delayed referral often contributes to scar rupture. Management of scarred uterus by skilled manpower in an appropriately equipped health care facilities with meticulous supervision for cases undergoing a trial of labor is strongly advocated to reduce this disastrous complication.

Even when there is suspicion of uterine rupture, prompt surgical intervention should be taken to avoid the dreadful consequences of severe maternal and perinatal morbidity and mortality especially in the setting of developing countries like Nepal.

The prevalence of rupture uterus was 0.76% in our study which is greater than 0.071% in the study done at a tertiary centre in Kathmandu.12 Another study in eastern Nepal tertiary care hospital of Ethiopia reflecting even more worse conditions than our setting.8 The prevalence of rupture uterus was 0.76% in our study. Another study in eastern Nepal tertiary care hospital of Ethiopia reflecting even more worse conditions than our setting.8 The prevalence of rupture in our study may be due to the delay in diagnosis of rupture and delayed referral often contributes to scar rupture. Management of scarred uterus by skilled manpower in an appropriately equipped health care facilities with meticulous supervision for cases undergoing a trial of labor is strongly advocated to reduce this disastrous complication.

CONCLUSIONS

Uterine rupture, often a preventable condition is a serious complication and a major contributor to maternal morbidity and neonatal mortality. Previous caesarean scar rupture is the most common cause of rupture. Promotion of skilled birth attendant, identification of high risk pregnancy, judicious caesarean section, cautious use of oxytocic drugs, proper labor monitoring and education about supervised pregnancy and institutional delivery are essential in reducing its occurrence.

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