Uterine Rupture: Shifting Paradigm in Etiology

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ABSTRACT

Background

Rupture uterus is associated with significant maternal and perinatal mortality and morbidity. Etiologies of uterine rupture are changing with time. There has been shift in etiology from an obstructed labour and multiparity towards rupture of a caesarean section scar. There is paucity of studies regarding this changing paradigm.

Objective

To study the changing etiological pattern of rupture uterus.

Method

We retrospectively analysed details of all patients with ruptured gravid uterus from Medical records of Nobel Medical College from 2013 July 1 to 2015 June 30. Sociodemographic predisposing risk factors and feto-maternal outcomes were recorded in a structured proforma.

Result

Of the 11,571 deliveries, total of 52 (0.45%) had ruptured uterus. Caesarean Section were 3,218 (28%) of total deliveries. Among 52 rupture cases, 41 (78.84%) were because of previous Caesarean scar followed by obstructed labor, prostaglandin and oxytocin. The occurrence of rupture in previously scarred uterus was 1.27%. 82.9% of the uterine rupture occurred in women with one previous LSCS. Most women were primipara of 25-29 years. It was seen more commonly in unbooked cases 49 (~95%). Laparotomy with repairment of rupture and bilateral tubal ligation was the commonest mode of management. Majority were anemic. Perinatal mortality was 41 (79%) with 5 (9.6%) maternal deaths.

Conclusion

Previously scarred uterus is the commonest cause of uterine rupture. Early diagnosis and management is needed to prevent poor outcomes. Avoidance of injudicious cesarean deliveries reduces number of future scars. Awareness generation regarding antenatal care and timely referral are vital.

KEY WORDS

Caesarean section, Paradigm shift, Uterine rupture

INTRODUCTION

Rupture of gravid uterus is important and preventable cause of maternal and perinatal mortality and morbidity in developing countries.[1] Previously prolonged obstructed labour and injudicious use of the oxytocics were used to be the common causes of uterine rupture but in modern obstetrics there is rising trend of the caesarean section deliveries leading to uterine scar and future risk of rupture. Previous caesarean section is the main risk factor for uterine rupture in recent years.[2] It has been observed that cesarean scar rupture is increasing all over the Nepal. Although the level of obstetric care like better antenatal care, institutional deliveries and other risk factors are improved with time but absolute numbers of rupture uterus is not reduced in totality in our country. Previous caesarean section is the main risk factor for uterine rupture in recent years.[2] Caesarean delivery has crossed the 15% boundary limitation of WHO in developed and developing countries including Nepal where it is 20%.[6] Liberal use of caesarean deliveries in tertiary hospitals contributes to scar pregnancies.[4] In a WHO systematic review, the prevalence of rupture uterus in previous caesarean section is 1%. Overall incidence of the uterine rupture in developed countries is around 74 in 10000.[2] There is a different situation in developing countries since the incidence of uterine rupture is far higher that is 1 in 106.[3] With this background, we wanted to study the etiological profile of the women with rupture uterus in our setting to find out the changing trend in etiology.

METHODS

This is a retrospective analysis of the hospital record of all the uterine rupture pregnancies between 2013 July 1 to 2015 June 30 admitted in the department of the Obstetrics and Gynecology, Nobel Medical College, Biratnagar, Nepal. All women presenting with rupture on admission or those who developed this complication after admission were enrolled in the study. Total of 52 consecutive cases were included, each case was analysed in detail that included age, gravidity, parity, previous obstetric history including lower segment caesarean section (LSCS) etiology of rupture, type of surgical management complication and feto-maternal complications. The data was profiled using Microsoft Excel Worksheet 2013, and analyzed by simple descriptive statistics using the SPSS Software 14.0 version. Ethical approval was taken before study.

RESULTS

During the period of two years between 2013 July 1 to 2015 June 30, the totals of 11571 deliveries were conducted. The age range was from 18 to 42 years with most women (54%) were of 25-29 years. Total number of ruptured uterus was 52. This makes the overall prevalence of 0.45%.Total number of lower segment caesarean section (LSCS) were 3218 (28%) of total deliveries. Among 52 rupture cases, 41 (78.84%) were because of previous LSCS scar followed by obstructed labor, prostaglandin and oxytocin. The occurrence of rupture in previously scarred uterus was 1.27%. Eighty three percent of the uterine rupture occurred in women who had one previous LSCS. while analyzing maternal mortality and etiology of rupture uterus, all women died as a consequence rupture of the previous cesarean scar. Regarding etiology in para 0 group, two women had rupture uterus due to obstructed labour

Table 1. Age distribution of the study population

Age Group	Number	Percentage
Less than 20	3	5.76
20-24	9	17.3
25-29	28	53.84
30-34	10	19.23
35-39	1	1.92
More than 40	1	1.92

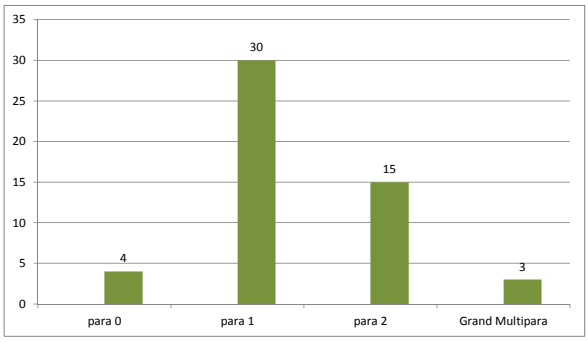

Figure 1. Parity distribution of the women with rupture uterus

Table 2. Etiology of Rupture Uterus

Etiology of Rupture Uterus	Number	Percentage
Scarred Uterus	41	78.40
Obstructed Labor	4	7.69
Prostaglandins	3	5.76
Oxytocin	2	3.84
Spontaneous	2	3.84

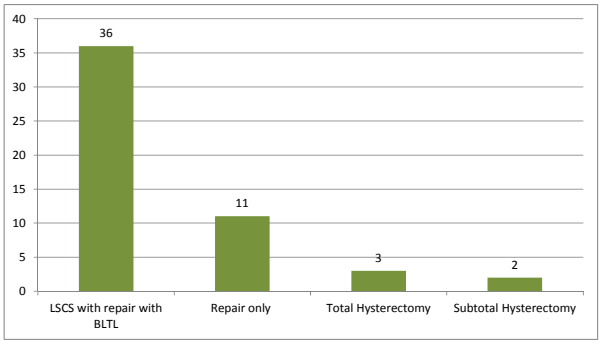

Figure 2. Mode of surgical intervention

where cephalopelvic disproportion was not detected in peripheral health facility and was referred late. Other one had rupture uterus due to injudicious use of oxytocin and was referred to our centre after 10 hour of labor trial in primary health care centre. The fourth case was induced with PGE1 in post dated pregnancy after ruling out cephalopelvic disproportion. Most of the women were of primipara 30 (58%) followed by para-2 15(28.84%). Ninety five percent (95%) of the women were unbooked and most of them were cared by health post, primary health centre and village women health workers. Seventy five percent had complete rupture followed by incomplete ones (20%). Most of the rupture uterus 36(70%) were managed with laparotomy with repair with bilateral tubal ligaton (BLTL) followed by repair only 11(21.15%). Regarding maternal complications, unfortunately five (9.6%) deaths occurred among 52 rupture cases. Other complications were anemia in 28 (54%) and wound infection 19(37%). Unfortunately only 11(21%) neonates survived while others were stillbirth 38(73%) and macerated three (6%).

Table 3. **Parity and period of Gestation vs etiology of ruptured uterus**

Parity	Scarred Uterus	Obstructed Labour	PG	Oxytocin	Spontaneous
Para0 (n=4)		2	1	1	
Para1(n=30)	30				
Para2(n=15)	9	1	2	1	2
Grand Multipara (n=3)	2		1		
Period of Gestation					
<34weeks					
34-37weeks	5				
37-40weeks	26	3		2	2
>40weeks	10		4		

DISCUSSION

Among 11571 deliveries, total rupture cases were 52. The frequency in our study was 0.45%. (1 in 223 deliveries). One would expect that with improved and accessible antenatal care facility and institutional deliveries, there should be dramatic reduction in incidence of obstructed labor and its sequelae that was common previously but the scenario is different. Our results showed that the incidence of rupture is not reduced but only the cause is changed from obstructed labor to scarred uterus. Study by Zia et al. reported the incidence to be 0.09% which is similar (0.09%) to the study in Nepal by Padhye in 2000.[7,8] These above findings were not conforming with our findings (0.45%) but our result tends to corroborate with studies done in other developing countries like Nigeria 0.83%, Pakistan 0.74%.[9] In developed countries like Australia the incidence is 0.086% and Ireland 0.023%. Above data show that, in Nepal the incidence of rupture uterus is increasing rapidly probably because of

Table 4. **Maternal operative and post-operative complications in patients with rupture uterus**

Variable	Frequency	Percentage
Anemia	28	54
Wound infection	19	36
Prolonged hospital stay >10 days	19	36
Bladder injury	7	13
Burst abdomen	6	11
Maternal death	5	9
Vesico-vaginal fistula	2	4
Fecal fistula	1	2
Ureter tie	1	2

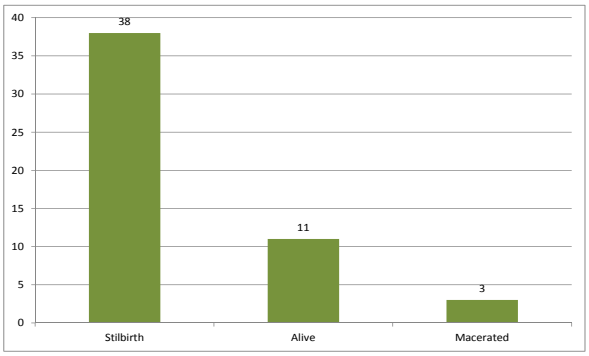

Figure 3. **Neonatal outcomes**

liberal use of caesarean section deliveries. In comparison to developed countries, other causes of increased incidence in our country may be due to reduced and early access to obstetric care services (ANC), inadequate provision of health care services, inadequate awareness of the risk and sequelae of the previous LSCS and lower socioeconomic status. The mean age of our patients was 32 years which is similar to study by Zia et al. and Rouzi et al.[7,10] It seems that maternal age is not an important risk factor for rupture uterus.[7,10] In our study the rate of LSCS was 28%, it is higher than in recent studies in tertiary centres in Eastern Nepal by Subedi et al. (19.89%) and Agrawal et al. (26.9%).[6,11] Above study show that in Nepal itself, the number of caesarean deliveries is increasing yearly contributing to the previous scar pregnancies. Our study show that 78.84 % of rupture uterus were due to previous LSCS which is high than other studies 29% and 54.1%, 50.6%, 63.4%, 62%.[8,12-15] In above studies, previous scar is the commonest cause of the rupture uterus. The trend is towards increased number of rupture due to previous caesarean deliveries. The high incidence of rupture uterus in our studies is due to late presentation that is only after the labor pain is already established. High incidence of primipara in our study is comparable to the studies by Latica et al. and Rashmi et al.[13,14] Our most primiparas belonged to previous caesarean section group. Our 94.23% cases were unbooked which is similar with reports from Singh et al. 92.5%.[16] Our incidence of rupture uterus in previous LSCS was 1.27%, Recent Indian study showed it to be 1.69% which is higher than

shown by WHO systematic review 1%.[2,16] Our study showed that 75% cases had complete rupture, 20% incomplete rupture and rest had no mention of the type of rupture, this corroborates with the finding shown by Padhye.[8] Seventy percent of our patients underwent LSCS with repair with BLTL and 21% had repair only. In study in Nepal 60% underwent repair with BLTL, repair only 24%, 10% sub total hysterectomy, 6% total hysterectomy.[8] Hassan et al. reported repair with tubal ligation 31%, repair only 27.3%, hysterectomy 32.1%, Uterine repair with bladder repair 2.3% and hysterectomy with bladder repair in 7.1%.[12] Maternal outcome was very poor in our study 9.6% with perinatal mortality of 79% but other studies Singh et al. reported maternal mortality 2.5%, perinatal mortality 85%.[16] Hassan et al. maternal mortality 7%, perinatal deaths 75% and Latica et al. reported maternal mortality 2.76%, perinatal mortality 94.07%.[12,13] High mortality in our study may be due to late presentation, decreased awareness about the risk and sequelae of previous scar and failure to diagnose condition at first referral centre and arrival at tertiary centre in moribund condition. The high feto-maternal mortality reflects the poor health care services and inco-ordination between and unavailability of expert human resources of multiple specialties in tertiary setting. Therefore integrated multidimensional effort from different sectors are vital for the care of the mother and baby. Since most of the patients were unbooked, proper antenatal care is fundamental for prevention. Exclusive referral centres or allied should carryout antenatal care which is milestone for reducing maternal mortality. Previous LSCS should be taken care of judiciously. Anemia and nutritional status should be corrected during antenatal check up. More than 90% of the patients are from remote areas and were referred to our centre lately once the labor has started. These patients should be admitted at least 3 weeks prior to delivery in Rehabilitation centre or gearing up of the Remote health centre with expert. Timely and proper intervention is required which is too some extent not possible in our scenario. Therefore, at that moment, there should be provision of rehabilitation centre with expert in nearby referral centre. The properly treated women tune other pregnant women in the community in future. Most patients are from the rural areas where training and retraining to local level health worker is necessary to make them aware of early referral at least 3 weeks before the expected date of delivery to tertiary centre. At last, our study is a retrospective study and the study setting is limited to NMCTH only but it does not seem to affect the ultimate results.

CONCLUSION

Previous lower segment caesarian section (LSCS) leading to scar formation is the commonest cause of uterine rupture with high maternal and perinatal mordidity and mortality Women, family members and other health personnel should be educated and informed about the importance of supervised and planned delivery in well equipped hospitals in subsequent pregnancy of previous LSCS scar.

RECOMMENDATIONS

- Health Education regarding the importance of normal vaginal delivery in women of reproductive age group, village health workers
- Basic Training about the risk and early recognition of the previous LSCS scar rupture to primary health workers, nurses, auxillary nurse midwives
- To reduce the number of liberal caesarean deliveries by judicious, cautious and careful planning of LSCS
- Importance of institutional delivery
- Early and easy accessibility to health institution
- Use of communication medias for safe motherhood programme promotion

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