Original Article

Uterine Rupture in Pregnancy-One Year Experience

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Abstract

Objective: To determine the frequency, risk factors, maternal and fetal morbidity and mortality in uterine rupture. **Study Design:** A cross-sectional study. **Patients and Methods:** The study was conducted in Department of Obstetrics and Gynaecology, Allied Hospital, Faisalabad (a tertiary care centre) from January 2010 to December 2010. All cases of ruptured uterus who where admitted with or who developed this complication in the hospital were included in the study. **Results:** The frequency of uterine rupture was (0.39%). Out of these, only 7 patients (18%) were booked. The main risk factor was scarred uterus in 30 cases (79%) and (21%) was in unscarred uterus. Amongst unscarred uterine rupture, risk factors were grand multiparity (9%), obstructed labour (5%), oxytocic agents (5%) and forceps delivery (2%). Repair of uterus was done successfully in 29 cases (76%). Obstetrical hysterectomy was done in 9 cases (24%). There were two maternal deaths (5.2%) and 32 (84%) still births. **Conclusion**: This study showed high frequency of serious obstetrical problem which can lead to high fetomaternal mortality. The leading cause of uterine rupture was scarred uterus (cesarean scar). To prevent this serious complication from occurring, most important is assessment of risk factors for uterine rupture both antenatally and in intrapartum period and to counsel the patient properly. Improvements which could also be implemented include availability of transport facilities for the patients and training sessions for the staff in emergency. **Key Words**: Uterine rupture, Scarred uterus, Feto-maternal morbidity and mortality.

INTRODUCTION

Uterine rupture is defined as separation of entire thickness of uterine wall with extrusion of fetal parts and intra-amniotic contents into the peritoneal cavity[1]. Uterine rupture is an uncommon complication of pregnancy associated with potentially catastrophic consequences for both mother and baby. The prevalence rate tend to be lower in developed countries than in under developed countries. The incidence is 0.03 to 0.3%[2]. The reported incidence of spontaneous rupture of unscarred uterus ranges from 1 in 8000 to 1 in 15000 deliveries[3]. Risk factors for uterine rupture in atepartum period are caesarean section, hysterotomy[4], myomectomy[5], placenta percreta[6], mullerian anomalies of uterus[7], previous difficult uterine curettage[8] complicated by perforation. The most common risk factors for intrapartum rupture in unscarred uterus are grand multiparity obstructed labour, oxytocin and prostaglandin augmentation in multiparous women and instrumental delivery[9]. Fetal outcome in uterine rupture is related with time elapsed between onset of prolonged deceleration and delivery. If early (<15 min), there is fetal hypoxia and metabolic acidosis (39%) and low apgar score. In late presentation (>18 min), when whole placenta and fetus are extruded into peritoneal cavity, this may result in hypoxic ischemic encephalopathy and perinatal loss[10]. Regarding maternal outcome, in developed countries uterine rupture rarely results in maternal death but may have significant morbidity including hypovolaemic shock, acute renal failure, complications of massive blood transfusion, Adult Respiratory Distress Syndrome (ARDS), disseminated intravascular coagulation (DIC), peripartum hysterectomy, urologic injury (4.1%)[11] and post-op complications like thromoembolism and infections. In less developed countries like Pakistan, uterine rupture is an important cause of maternal mortality (7.76%)[12]. Difficulties in transport, access to health care, non availability of resources to deal with massive obstetric haemorrhage are factors contributing to increase maternal mortality. This study was designed to determine the frequency of uterine rupture and to analyze the risk factors and

consequences in Gynae department at Allied Hospital, Faisalabad.

PATIENTS AND METHODS

This study was carried out in the Department of Gynae and Obst at Allied Hospital, Faisalabad from January 2010 to December 2010. Allied Hospital, Faisalabad is the only tertiary care hospital which covers the whole population approximately 6.5 million. The average number of deliveries are more than 9000 per annum. Gynae and Obst department accepts and manages both booked and unbooked pregnant women. In spite of availability of free antenatal care most of women are unbooked. The data have been extracted retrospectively from patient charts who underwent laparotomy for uterine rupture in pregnancy. All cases, who were admitted with uterine rupture or developed this complication in the hospital were included in this study. Data regarding risk factors, intra-operative course and outcome were extracted and analyzed using frequency tables.

RESULTS

During this study period in year 2010 the total number of deliveries at AHF were 9769. The total number of cesarean section was 4077 representing 41% of total deliveries. Further analysis showed that this higher percentage age of operative deliveries was mostly due to repeat cesarean section 2397 (59%). There were 38 cases of rupture uterus representing 0.39% out of these, only 7 patients (18%) were booked. The mean age of women who had rupture was 31 years. Majority of ruptures occurred in Para 2-4. The main risk factor was scarred uterus in 30 cases 79%. Amongst scarred uterus, there were 15 patients with one scar. The 978 patients who underwent trial of scar (vaginal birth after caesarean section), 6 cases (0.6%) had rupture uterus, 9 (30%) patients with previous one section presented with rupture uterus had trial of scar outside the Hospital. 5 out of 9 were classical cesarean section. 14 (46.61%) were with previous two and one (3.3%) was with previous 3 sections. Amongst unscarred uterus (21%), Grandmultiparity was the sole risk factor in 3 (9%) (All of them were P8 or more). Malpresentation and obstructed labour were reported in 2 (5%) women. Instrumental delivery (forceps) was involved in 1 (2%) woman. Oxytocin was involved in 2 (5% women who were P6. Regarding maternal outcome, rupture was repaired successfully in 29 cases (76%), Obstetrical hysterectomy was done in 9 cases (24%), bladder injury occurred in 3 cases (7.9%). Out of 38 cases, 5 patients (13%) developed acute renal failure. 2 patients (5.2) underwent internal iliac ligation along with hysterectomy. There were 2 maternal deaths (5.2%). One patient presenting with rupture uterus developed DIC and expired on next day in ICU. The other one presented with irreversible shock and endorgan failure. There were 32 (84%) still births. Six babies had 5 minute Apgar score of less than 6. They were admitted to neonatal intensive care unit and later on discharged after 24 hours.

Table-1
Risk factors for uterine rupture in scarred uterus n=30

SR.#	Risk Factors	No. of Patients	%age
01	VBAC (Trial of scar in hospital)	6	0.6%
02	Trial of scar outside the hospital	9	30%
03	Previous two scars	14	46.6%
04	Previous 3 scars	1	3.3%
05	Myomectomy scar	0	0%

Table-2
Risk factors in unscarred uterus n: 08

SR.#	Risk Factors	No. of Patients	%age
01	Grand multiparity	3	9%
02	Obstructed labour	2	5%
03	Oxytocic Agents	2	5%
04	Forceps delivery	1	2%

Table-3
Maternal morbidity and mortality

SR.#	Morbidity	No. of Patients	%age
01	Hypovoleumic shock	12	31%
02	Obstetrical hysterectomy	9	24
03	Bladder injury	3	7.9%
04	Acute renal failure	5	13.0%
05	DIC	1	2.6%
06	Internal iliac ligation with hysterectomy	2	5.2%
07	Maternal deaths	2	5.2%

DISCUSSION

Uterine rupture is a rare complication but it has potentially catastrophic implications for both mother and baby. Inspite of recent advances in modern obstetrics it remains a life-threatening complication of pregnancy and labor in the developing world. The increase in uterine rupture is expected with increasing

caesarean section rate. This has not been the case in the developed world because of increase vigilance, rigorous monitoring in labour and adoption of strict interventional criteria. The incidence of uterine rupture in our hospital during the study period was 0.39% (1 in 257 deliveries). It was almost comparable (0.55%) as reported by Malik HS[12]. In contrast, a study from India, showed the incidence of uterine rupture was 0.17%[13]. The frequency in our hospital is much high (1 in 257) as compared to in a study from Saudi Arabia[14] (1 in 1011 deliveries). Scarred uterus is the most important risk factor in uterine rupture, representing 79% in our study. This is much high as compared to many other reports, Gupta A et al showed 35% rupture was due to scarred uterus (36%) in a study in Dohuk[15]. The results are comparable with study in Turkey by Yilmaz M et al (78.6%) and 87% in Netherlands[17]. Rupture of unscarred uterus is an extremely rare entity. In this study, 8 of 38 (21%) uterine ruptures occurred in patients with unscarred uterus. This is similar in study Yilmaz M et al. (21.3%). American College of Obstetricians and gynaecologist reported that rupture of non scarred uterus may occur in obstructed labour, multiple gestations, abnormal lie and in women of grand multiparity. Chuni N[18] noticed that grand multiparity is most common (46.5%) factor for uterine rupture in women with unscarred uterus, in contrast with this study that showed 9%. Undiagnosed malpresentation may lead to obstructed labour and uterine rupture as a sequelae. This was reported in 2 cases (5%) in present study. This is very low in comparison to some African countries where obstructed labour is most common factor representing (73.3%)[19]. One study in India showed 52.63% and in Iraq 36%. Use of oxytocic agents was reported a cause of rupture in unscarred uterus in 2 cases only (5%). The reason may be related to high parity which may limit the use of this drug in labour. The morbidity rate due to rupture uterus was high in our study. Out of 38 cases, 9 (24%) cases were underwent hysterectomy. That was comparable in a study conducted by Malik HS 23% and Ahmadi et al 32% cases had hysterectomy[20]. Other studies from Sudan (80%)[21], Nigeria (53.6%)[22] of women who had uterine rupture were treated with hysterectomy. This high incidence was due to unscarred ruptured uterus and uterus was not deemed repairable. In our study bladder injury was seen in 3 cases (7.9%) comparable with a study conducted by Gupta A et al (8.74%). Maternal death as a consequence of uterine rupture occurs at a rate of 0-1% in modern developed nations, but in developing countries mortality rates are 5-10%. The availability of modern medical facilities in developed nations account for this difference. In our study 2 maternal deaths (5.2%) were due to rupture uterus, in contrast to Castaneda et al who reported no maternal death[23]. One study in India showed 9.3% maternal death due to rupture uterus[24]. Chuni N et al reported that maternal mortality rate was very high (13.5%)[18]. The perinatal mortality rate associated with uterine rupture was 84% (32/38) in this study, comparable with other studies in developing countries (74%)[25] and in a local study in Pakistan (81.7%)[12]. This was considerably higher than rates reported from Canada 46% by Bujold and Gauthier[10] and 10.3% from Israel[26]. The high incidence of rupture uterus seen in our community might be due to poor public knowledge about risk of pregnancy after one or more caesarean section and lack of resources in our country. Our community has high fertility rate but lack of well equipped maternity hospitals. Inappropriate placement of patients for trial of scar together with untrained traditional birth attendants are significant factors in this problem. An integrated effort is needed to reduce the frequency, maternal and fetal morbidity and mortality in rupture uterus. Improvements which could be implemented include advances in antenatal care and training sessions for staff in emergency and transport system.

CONCLUSION

Rupture of pregnant uterus is a major obstetric complication. It is associated with high maternal and fetal morbidity and mortality. The increase in uterine rupture is related with increasing caesarean section rates (scarred uterus). To prevent this serious complication from occurring, most important is assessment of risk factors for uterine rupture, both antenatally and in the intrapartum period and counsel the patient properly. This should be flagged up in the antenatal notes, including a plan for delivery and careful use of prostaglinds for induction of labour. Senior input is vital in these decisions.

REFERENCES

1. Ofir K, Sheiner E, Levy A, Katz M, Mazor M. Uterine rupture: difference between a scarred and unscarred uterus. Am J Obstet Gynecol 2004; 191:425-29.

2. Tower C. Obstetric emergencies. In: Baker PN, Kenny LC eds. Obstetrics by Ten Teachers 19th ed. London: Arnoid. 2011: 241-57.
3. Walsh CA, Baxi LV. Rupture of primigravid uterus: a review of literature. Obstet Gynaecol Surv 2007; 62:327-34.
4. Michael A, Belfor and Gary A, Dildy III. Postpartum Hemorrhage and other problems of third stage. In: James DK, et al eds. High risk pregnancy management options, 4th ed. London:WB Saunders. 2011:1283-311.
5. Parker WH, Lacampo K, Long T. Uterine rupture after laparoscopic removal of a pedunculated myoma. J minim Gynecol 2007; 14:362-4.
6. Le Maire WJ. Louisy C. Dalassendri K, Muschenheim F. Placenta percreta with spontaneous rupture of an unscarred uterus in second trimester. Obstet Gynecol 2001; 98:927-9.
7. Kore S, Pandole A, Akolekar R. Vaidya N, Ambiye VR. Rupture of left horn of bicornuate uterus at 20 weeks of gestation. J Postgrad Med 2000; 46:39-40.
8. Reed WC. Large uterine defect found at caesarean section. A case report. J Reprod Med 2003; 48:60-62.
9. Mishra N. Chandraharan E. Rupture of uterus. In: Warren R et al eds. Best practice in labour and delivery. Ist ed. New York Cambridge. 2009: 252-61.
10. Biyold E, Gauthier RJ. Neonatal morbidity associated with uterine rupture: What are risk factors? Am J Obstet Gynecol 2002; 186:311-4.
11. Kwee A, Bots ML, Visser GH, Bruinse HW. Uterine rupture and its complications in Netherlands: a prospective study. Eur J Obstet Gynecol Reprod Biol 2006; 128:257-61.
12. Malik HS. Frequency predisposing factors and fetomaternal outcome in uterine rupture. J Coll physicians surg Pak. 2006; 16:472-5.
13. Gupta A, Nanda S. Uterine rupture in pregnancy: a five-year study. Arch Gynecol Obstet. 2011; 283:437-41.
14. Rouzi AA, Hawaswi AA, Aboalazam M, Hassanain F, Sindi O. Uterine rupture incidence, Risk factors and outcome. Saudi Med J 2003; 24:37-9.
15. Yalda MA, Munib A. Uterine rupture in Dohuk, Iraq East Mediterr Health J 2009; 15:1272-77.
16. Yilmaz M, Isaoglu U, Kadanali S. The Evaluation of uterine Rupture in 61 Turkish Pregnanct Women. Eur j Gen Med 2011; 8:194-199.
17. Zwart JJ, Richters JM, Ory F et al. Uterine rupture in the Netherlands: a nationwide population-based cohort study. BJOG 2009; 116: 1069-80.
18. Chuni N. Analysis of uterine rupture in tertiary centre in Eastern Nepal: Lesson for obstetric care. J Obstet Gynecol Res 2006; 32:574-9.
19. Rupture uterus in Ehtopia. Int J Gynecol Obstet 1996; 54:175-176.
20. Ahmadi S, Nouira M, Bibi M et al. Uterine rupture of unscarred uterus. About 28 cases. Gynaecol Obstet Fertil. 2003; 31:713-7.
21. Ahmed SM, Daffalla SE. Incidence of uterine rupture in teaching hospital, Sudan. Saudi Med J 2001; 22:757-61.
22. Ezchi OC, Mabayoje P, Obiesie LO. Rupture uterus in South Western Nigeria: a reappraisal. Singapore medical Journal 2004; 45:113-6.
23. Castaneda S, Karrison T, Cibils LA. Peripartum Hysterectomy. Journal of Perinatal Medicine 2000; 28:722-81.
24. Hoffmeryr GJ, Say L, Culmezoglu AM. WHO systematic review of maternal mortality and morbidity; the prevalence of uterine rupture. Br J Obstet Gynecol 2005; 112:1221-8.
25. Noahum GG. Uterine rupture in pregnancy. e medicine [online article] (http:/www.e medicine.com/MED/topic 3746. htm, accessed 5 december 2008)
26. Ofir K et al. Uterine rupture: risk factors and pregnancy outcome Am J Obstet Gynecol 2003; 189:1042-6.

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