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Original Article

Risk Factors for Scar Ruptures During Labour in Patients with Previous History of Cesarean Section

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ABSTRACT

Introduction: *Cesarean scar dehiscence (CSD) is an infrequent yet significant occurrence following lower segment cesarean section (LSCS) surgery. It is often linked to underlying uterine anomalies, such as a cesarean scar. This study aimed to assess the risk factors for scar ruptures during labor in patients with a previous history of cesarean section.* ***Methods and Materials:*** *This was a prospective observational cross-sectional study that was conducted in the Department of Obstetrics and Gynaecology in Dhaka Medical College Hospital, Dhaka, Bangladesh from November 2016 to April 2017. In total 25 women with a previous history of cesarean section with labor pain admitted to the mentioned hospital were enrolled in this study as the study subjects. All cases were selected by purposive sampling technique. Data were processed, analyzed and disseminated by using MS Office tools.* ***Results:*** *This study revealed that in about 24% of cases, the risk factor was a 'history of 1 previous LSCS with oxytocin infusion'. In 16% of cases, risk factors included 'previous 1 LSCS with misoprostol induction' or '1 LSCS with home trial of labor and VBAC attempt'. Additionally, 8% of cases had risk factors like '2 previous LSCS with misoprostol', 'grand multiparity with oxytocin use', or '2 previous LSCS with oxytocin for labor'.* ***Conclusion:*** *In this study, there is every possibility of finding mixed risk factors in case of scar rupture. The combination of misoprostol, oxytocin and previous LSCS claimed the highest rank among the risk factors that was subsequently followed by only previous LSCS.*

Keywords: *Risk factors, Scar, Ruptures, Labour, Cesarean section*

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INTRODUCTION

A Cesarean section (C/S) is a surgical procedure performed to deliver a baby by making an incision in the uterus. It stands as the most prevalent surgical intervention in obstetrics, with global rates ranging from 10% to 25% [1]. The primary reason for opting for a Cesarean section is often the need for a repeat procedure. During the latter part of the 20th century, choosing a Cesarean section (C/S) implied a high likelihood of subsequent pregnancies following the same route. This practice emerged due to concerns about the potential for severe uterine scar ruptures associated with the classical Cesarean section method. These concerns persisted even after transitioning to the lower segment Cesarean section (LSCS) approach, despite the absence of the same foundational reasons [1]. Uterine rupture during pregnancy is an infrequent phenomenon, whereas uterine scar dehiscence is a more prevalent occurrence [2]. Cesarean scar defects (CSDs), which refer to insufficient uterine scars or scar dehiscence after a Cesarean section, entail a disruption in the myometrial tissue at the location of a prior Cesarean incision. These structural anomalies resulting from previous Cesarean surgeries have been linked to persistent postmenstrual spotting and enduring chronic pelvic pain [3,4]. The research conducted by Ofili-Yebovi et al. revealed the presence of uterine scars in 99.1% of patients who had previously undergone cesarean section surgery. Among these patients, 19.4% exhibited a defect in their scar tissue, with 9.9% of these defects classified as severe, characterized by a loss of over 50% of the myometrial mantle at the scar site [5]. The worldwide incidence of uterine scar dehiscence, regardless of the underlying cause, stands at approximately 0.6% [6]. Uterine scar rupture is classified into 2 categories; complete and incomplete dehiscence. Uterine rupture risk factors encompass various conditions such as myomectomy, septoplasty, metroplasty, traumatic events, congenital uterine anomalies (particularly ectopic pregnancy in the rudimentary horn), insufficient treatment of endometriosis, placental abruption, and mid-forceps delivery. It's worth noting that postpartum ruptures can also manifest in patients undergoing vaginal delivery after having undergone previous cesarean sections [7-9]. Prominent underlying causes often include a history of prior lower segment cesarean section, classical cesarean section, past uterine trauma, congenital anomalies, abnormal placental implantation, and improper administration of oxytocin [6]. Several reported risk factors apply to a broad range of patients, including nulliparity, diabetes, emergency surgical situations, infections, and an incision placed too low in the uterine segment [10]. The matter of delivering a woman who has previously undergone a cesarean section remains a contentious topic [11]. The intricate interplay of confounding variables and the divergence in clinical approaches make it challenging to apply obstetric knowledge to individual cases. Maternal mortality and morbidity are heightened consequences stemming from inadequate maternal care, unfavorable socioeconomic and environmental conditions, restricted access to healthcare services, and suboptimal nutrition within this obstetrical emergency context [12]. As a result, a deeper exploration of uterine scarring among patients undergoing repeat cesarean sections through additional studies is imperative. The objective of this current

study was to assess the risk factors for scar ruptures during labor in patients with a previous history of cesarean section.

METHODS & MATERIALS

This prospective observational cross-sectional study was carried out at the Department of Obstetrics and Gynaecology in Dhaka Medical College Hospital, Dhaka, Bangladesh, spanning from November 2016 to April 2017. The study encompassed a cohort of 25 women who had a history of prior cesarean sections and were experiencing labor pain upon admission to the hospital. The participants were selected using a purposive sampling technique. Ethical approval for the study was obtained from the hospital's ethical committee, and all participants provided informed consent before data collection. The study employed specific exclusion criteria, which led to the exclusion of pregnant mothers who lacked a previous history of cesarean section. Comprehensive demographic and clinical information for each participant was meticulously recorded. MS Office tools were utilized for data processing, analysis, and presentation. Statistical analysis deemed a P value below 0.05 as an indicator of statistical significance.

RESULTS

Within this study, the participants exhibited an average age of 32.36 ± 2.93 years (mean ± standard deviation). Among the 25 mothers included, the highest proportion, accounting for 52% of the total, underwent their second cesarean section between the ages of 31 and 35. Following this, the age group of 26 to 30 years constituted 24% of the cases. Within the scope of this study, out of the 25 mothers observed, 14 (56%) fell within the parity range of 1-2, while 9 (36%) were in the parity range of 3-4. Only 2 (8%) mothers could be classified as grand multiparas. In terms of antenatal care (ANC) attendance, among the 25 mothers, 16 (64%) had 'irregular' ANC visits, 8 (32%) had 'no' ANC visits, and merely 1 (4%) underwent regular ANC visits. Analyzing the gestational age at which uterine rupture occurred, the highest percentage, constituting 52% of the cases, was observed between 37 and 40 weeks of gestational age. Following closely, 28% of the cases presented uterine rupture at a gestational age of 36 weeks or less. The remaining 20% of the cases were classified as postdated pregnancies at the time of rupture. In this study in analyzing the risk factors among the total of our participants we observed that in about one-fourth of the cases (24%), the risk factor was ‘history of 1 previous LSCS with use of oxytocin infusion for augmentation of labor’. In 16% of the cases the risk factor was either ‘history of previous 1 LSCS and use of misoprostol for induction of labor’ or ‘previous 1 LSCS and home trial of labor in current pregnancy and trial for VBAC’ Separately in 8% of the cases, ‘history of previous 2 LSCS and labor pain with the use of misoprostol’ or ‘grand multiparity with previous history of 1 LSCS and use oxytocin in current pregnancy’ or ‘2 previous LSCS and use of oxytocin in current pregnancy for augmentation of labor’ was found as the risk factors. The most prevalent complication observed was anemia, accounting for the highest occurrence at 68%.

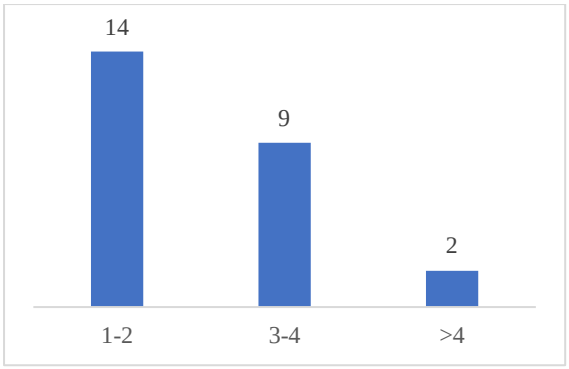

Figure 1: Distribution of mothers according to parity (N=25)

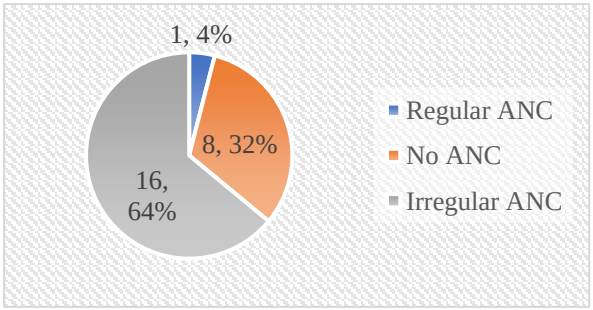

Figure2: Distribution of mothers according to antenatal care visit (N=25)

Table I: Distribution of mothers according to gestational age at rupture (N=25)

Weeks	n	%
32-35	7	28%
36-38	13	52%
> 38	5	20%
Mean ±SD	37 ±3.9	

Table II: Distribution of identifiable risk factors for ruptured uterus (N= 25)

Risk factors	n	%
History of 1 previous LSCS with the use of oxytocin infusion for augmentation of labor	6	24%
History of previous 1 LSCS and use of misoprostol for induction of labor	4	16%
Previous 1 LSCS and home trial of labor in current pregnancy and trial for VBAC	4	16%
History of previous 2 LSCS and labor pain with the use of misoprostol	2	8%
Grand multiparity with previous history of 1 LSCS and use of oxytocin in the current pregnancy	2	8%
2 previous LSCS and use of oxytocin in current pregnancy for augmentation of labor	2	8%
Twin pregnancy with a previous history of one C/S with labor pain	1	4%
Previous history of 2 cesarean sections with polyhydramnios and labor pain	1	4%

Table III: Postoperative complications (N=25)

Complications	n	%
Anaemia only	17	68%
Anaemia and sepsis	3	12%
Anaemia with sepsis and wound gap	2	8%
Uterine sub involution	3	12%

DISCUSSION

This study aimed to assess the risk factors for scar ruptures during labor in patients with a previous history of cesarean section. In this study, among the 25 mothers included, the highest proportion, accounting for 52% of the total, underwent their second cesarean section between the ages of 31 and 35. In this study, a majority of the patients, specifically 13 (52%), fell within the age range of 31-35 years. This is in line with findings from Khan et al.'s study [13], which also reported that the highest percentage of women belonged to the age group of 31-35 years (47%). The mean age and the age group predominantly affected by uterine rupture in our study align with findings documented in other similar studies. When examining parity among the 25 mothers, it was observed that 14 (56%) had a parity of 1-2, while 9 (36%) had a parity of 3-4. A small portion, just 2 (8%) mothers, were classified as grand multiparas. Regarding antenatal care (ANC) attendance, 16 (64%) mothers had irregular ANC visits, 8 (32%) had no antenatal checkups, and merely 1 (4%) adhered to regular antenatal visits. A significant majority of the patients, totaling 16 (64%), had irregular antenatal checkups, which is consistent with findings from other studies as well [14]. Among the un-booked patients, a prevailing trend was noted – most were brought to the hospital from remote areas. Common causes for these cases included inappropriate use of oxytocin and home-based labor trials, while the second most frequent cause was prolonged obstructed labor. These findings parallel those reported in the study by Malik HS and align with other studies where the rupture of a previous cesarean scar emerged as the foremost cause [15,16]. This study identified that a majority of mothers, accounting for 52%, experienced rupture of the uterus between 36-38 weeks of gestational age. Following this, 28% encountered rupture during the 32–35-week period. The remaining 20% of cases occurred beyond 38 weeks of gestational age. Within the group of 25 mothers studied, 12 (48%) had encountered complications after their prior Caesarean sections. These complications included wound discharge (12%), and wound infection (24%), of which 20% underwent secondary suture healing and 4% received tertiary suture healing. Additionally, secondary postpartum hemorrhage affected 8% of the cases, while puerperal sepsis impacted 4% of the cases. Cesarean scar dehiscence (CSD) stands out as a significant complication of lower segment cesarean section (LSCS) surgery. In many cases, the presence of underlying uterine defects, such as a cesarean scar, plays a pivotal role. A study by Ofili-Yebovi et al. demonstrated the presence of uterine scars in 99.1% of patients who had undergone cesarean

section surgery. Uncommon presentations have been reported, including associations with wound infections, secondary postpartum hemorrhage, and concurrent postpartum uterine and abdominal wall dehiscence. Infections with Streptococcus anginosus and Staphylococcus aureus have also been documented, underscoring the diverse spectrum of infections possible in such scenarios [17]. Contrary to the prevailing notion that uterine rupture primarily affects women with multiple pregnancies and is predominantly observed in those with a parity of 4 or more, this study revealed a different trend [18]. Uterine rupture was found to be more common in women with low parity, specifically those with a parity of 2 or less, constituting 56% of the cases. In this current study, the use of misoprostol and the use of oxytocin infusion was the prime risk factor followed by previous LSCS. An important observation in this study is that the majority of ruptures occurred due to a combination of risk factors. Oxytocics were administered inappropriately in many instances, often by individuals lacking proper experience, training, and possibly even lacking a medical background. Interestingly, even patients with classical cesarean sections, more than two prior cesarean sections, and contracted pelvis received oxytocics despite their conditions. This underscores the critical need for appropriate medical decision-making and skilled administration of medications in these cases.

Limitation of the study:

The study is designed as a cross-sectional investigation and follows a single-blinded, single-centered approach. However, the study's duration is relatively brief, and the sample size is limited. Consequently, it's important to acknowledge that the findings might not comprehensively represent the entire country's situation. Furthermore, due to the rarity of the condition under examination, the small sample size might inadvertently amplify the observed percentages, potentially leading to an exaggeration of the incidence rate.

CONCLUSION AND RECOMMENDATION

As per the findings of this current study, we can conclude that there is every possibility of finding mixed risk factors in case of scar rupture. The combination of misoprostol, oxytocin and previous LSCS claimed the highest rank among the risk factors that was subsequently followed by only previous LSCS. With some exceptions, maximum risk factors were observed in combination forms. Besides, there were versatile clinical features were observed as well as several categories of complications. Therefore, careful patient management observation throughout the admission period must be in a well-equipped unit with a round clock service for emergencies. The availability of expertise is the backbone for the successful management of such obstetrical emergencies. To get more specific results, we would like to recommend conducting similar studies in several places with larger-sized samples.

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Approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. *Dewhurst CJ. The ruptured cesarean section scar. Journal of Obstetrics & Gynaecology of the British Empire 1957; 64: 113-8.*
2. *Bashin A, Burstein E, Rosen S, Smolin A, Shiner E, Mazor M. Clinical Significance of uterine scar dehiscence in women with previous cesarean delivery: Prevalence and independent risk factors. J Reprod Med. 2008; 53:8-14.*
3. *Fabres C, Aviles G, De La Jara C, Escalona J, Munoz JF, Mackenna A, Fernandez C, Zegers-Hochschild F, Fernandez E. The cesarean delivery scar pouch: clinical implications and diagnostic correlation between transvaginal sonography and hysteroscopy. J Ultrasound Med 2003; 22: 695–700.*
4. *Klemm P, Koehler C, Mangler M, Schneider U, Schneider A. Laparoscopic and vaginal repair of uterine scar dehiscence following cesarean section as detected by ultrasound. J Perinat Med 2005; 33: 324–331.*
5. *Blanco JD, Collins M., Willis D, Prien S. Prostaglandin E2 gel induction of patients with a prior low transverse cesarean section. Am J Perinatal. 9:80-83.*
6. *Diaz, S.D., Jones, J.E., Seryakov, M., Mann, W.J. Uterine rupture and dehiscence: ten-year review and case-control study. South Med J. 95:431-5.*
7. *Morris H. Surgical pathology of the lower uterine segment cesarean section scar: Is the scar a source of clinical symptoms? Int J Gynecol Pathol 1995; 14: 16–20.*
8. *Ofili-Yebovi D, Ben Nagi J, Sawyer E, Yazbek J, Lee C, Gonzalez J, Jurkovic D. Deficient low-segment cesarean section scars: prevalence and risk factors. Ultrasound Obstet Gynecol 2008; 31: 72–77.*
9. *Incomplete cesarean scar rupture. Ahmadi F, Siahbazi S, Akhbari F. J Reprod Infertil. 14: 43-5.*
10. *Wagner MS, Bédard MJ. Postpartum uterine wound dehiscence: a case report. Journal of Obstetrics and Gynaecology Canada. 28: 713-715.*
11. *Guise J, Eerlin M, McDonagh M, Oserweil P, Chan B, Helfand M. Safety of vaginal birth after cesarean: a systematic review. Obstet Gynecol 2004; 103:420-29.*
12. *Dhaifalah I, Santavy J, Fingerova H. Uterine rupture during pregnancy and delivery among women attending the Al-thwart Hospital in Sana/A city of Yemen republic. Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub. 2006; 150:279-83.*
13. *Khan S, Parveen Z, Begum S, Alam I. Uterine rupture: A review of 34 cases at Ayub Teaching Hospital Abottabad. J Ayub Med Coll Abottabad 2003; 15:50-2.*
14. *Hasan JA, Zaki M, Kareem K. Rupture of the gravid uterus. J Surg Pak. 2005; 10:20-2.*
15. *Malik HS. Frequency, Predisposing factors and fetomaternal outcome in uterine rupture. J Coll Physicians Surg Pak. 2006; 16:472-5.*
16. *Gul A. Rupture of the previously scarred uterus. Ann King Edward Med Coll. 2004; 10:573-5.*
17. *Kaundinya KB, Caesarean scar uterine dehiscence-A review, uterus and ovary 2015;e751.dol:10.14800/uo.751.*
18. *Eze JN, Ibekwe PC. Uterine rupture at a secondary hospital in Afikpo, southeast Nigeria. Singapore Med J2010; 51:506-11.*