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Risk factors for scar dehiscence in previous caesarean delivery in our obstetric population

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Abstract
Introduction: Uterine scar dehiscence is a common complication of caesarean delivery, which increases the risk of uterine rupture. Uterine rupture is a complete division of all three layers of the uterus: the perimetrium, myometrium, and endometrium; while uterine dehiscence is considered an incomplete division of the three layers, allowing visibility of the foetus through the perimetrium.
Objective: To determine the risk factors for uterine scar dehiscence among women undergoing repeat cesarean delivery.
Methodology: This is a prospective observational study conducted at Dept. of Obst & Gynae, Shaheed Tazuddin Ahmad Medical College & Hospital, Gazipur, Bangladesh from July to December 2022. Total 120 women who underwent repeat LSCS and uterine scar dehiscence recorded by the operating surgeon were eligible. Data was collected regarding maternal age, obstetrical history, associated risk factors and outcome.
Results: Total 120 women with Uterine Scar Dehiscence were studied and risk factors determined. In the age groups, maximum uterine scar dehiscence were noted in age group of 20-25 years (38.3%) and 26-30 years (34.1%) and the number of pregnancies are also seen more in these age groups. however significant number of uterine scar dehiscence were noted in age group 31-35 years (24.1%). The rate of uterine scar dehiscence was found to be associated with increased pre-term delivery, around 30.8% in our study. This leaded to increased neonatal pre-term delivery, low birth weight (19.1%) and NICU admissions. Inter-delivery interval <24 months was observed in 23.3%, associated with pre-term delivery in 30.8%.
Conclusion: Uterine scar dehiscence is not uncommon among women undergoing elective repeat cesarean delivery. It is a clinically occult benign condition identified incidentally at repeat caesarean delivery and is not associated with any adverse maternal or perinatal outcome compared to uterine rupture which is associated with significant morbidity.

Keywords: Previous LSCS, scar dehiscence, pre-term, anemia, elective caesarean delivery

Introduction

Cesarean section is the most common major surgical procedure during childbirth. 80-90% of women who have already had a cesarean section will have another planned cesarean section in their next pregnancy [1, 2]. Previous cesarean delivery is the most important risk factor for both uterine scar rupture and uterine dehiscence. It is therefore not surprising that the recent increase in cesarean section rates has paralleled an increase in both conditions [3]. Uterine rupture is usually classified as (1) complete, when all layers of the uterine wall are severed, or (2) incomplete, when the uterine muscles are severed but the visceral peritoneum is intact. Incomplete rupture is also called uterine dehiscence. Uterine rupture is the complete separation of all three layers of the uterus (Periuterine, myometrial, and endometrial), whereas uterine dehiscence is an incomplete division of the three layers, allowing the fetus to be seen through the periuterine membrane. Uterine dehiscence is often asymptomatic [4]. Uterine rupture is life-threatening for both mother and baby. Uterine rupture usually occurs during active labor, but can also occur later in pregnancy. Uterine dehiscence has similar symptoms, but fewer layers are affected, there is less bleeding, and it is less risky. Uterine scar dehiscence generally refers to incomplete uterine scar rupture in which the serosa remains intact and the fetus, placenta, and umbilical cord remain in the uterine cavity [5]. It is usually a clinically hidden benign condition that is discovered incidentally during repeat cesarean section.

The incidence of cesarean scar dehiscence has been reported to range from 6.6% to 69%, with the variability being mainly due to the lack of criteria for cesarean scar dehiscence [6, 7]. Compared with complete uterine rupture, uterine scar dehiscence is associated with much lower maternal and neonatal morbidity. The cause of uterine scar dehiscence lies in the etiology of uterine scar defect or in any event that predisposes to cesarean scar dehiscence. Anatomical defects of the uterus that should have been corrected before pregnancy, such as uterine septum or uterine fibroids, can lead to a weakened uterus and a cesarean section scar. In general, uterine dehiscence is considered clinically subclinical and is not associated with adverse maternal or perinatal outcomes. However, it was significantly associated with NICU admission and low neonatal birth weight. This may be explained by the fact that more premature infants were in the uterine scar dehiscence group.

Materials and Methods

This is a prospective observational study conducted at Dept. of Obst & Gynae, Shaheed Tazuddin Ahmad Medical College & Hospital, Gazipur, Bangladesh from July to December 2022. A total of 120 cases of uterine scar dehiscence were included in this study to find out the predisposing risk factors. Women who underwent repeat caesarean delivery with uterine scar dehiscence found incidentally on table were studied. The studied variables included maternal characteristics like age, parity and presence of any medical co-morbidities; obstetrical history like previous preterm birth, gestational age, order of Caesarean Delivery, inter-delivery interval, twin gestation, presence or absence of labor at the time of Caesarean Delivery (Documented on routine pre-operative cardiotocogram), pain at the site of cesarean scar and technique of previous LSCS closure (Single versus double layer closure).

Inclusion criteria

Women with previous caesarean delivery undergoing elective or emergency cesarean delivery were eligible for the study.

Statistical analysis of data was carried out using SPSS statistical software. Quantative data were analysed with mean, median and standard deviation. Qualitative data (Categorical) were analysed with percentages and frequencies. The significance in difference between the two groups were assessed with cross tables, Pearson's chi square test and Fishers exact test were applied where ever necessary.

Results

Table 1: Age

Age	No. of cases	%
<20	1	0.8
20-25	46	38.3
26-29	41	34.1
30-34	29	24.1
>35	3	2.5

In the age groups, maximum uterine scar dehiscence were noted in age group of 20-25 years (38.3%) and 26-30 years (34.1%) and the number of pregnancies are also seen more in these age groups. however significant number of uterine scar dehiscence were noted in age group 31-35 years (24.1%)

Table 2: Period of gestation

Period of Gestation	No. of cases	%
<37 weeks	37	30.8
37-40 weeks	80	66.6
>41 weeks	3	2.5

The rate of uterine scar dehiscence was found to be associated with increased pre-term delivery, around 30.8% in our study. This leaded to increased neonatal pre-term delivery, low birth weight (19.1%) and NICU admissions. They suggested an association between preterm delivery and uterine infection/inflammation that may have simultaneously led to weakness of the uterine scar.

Table 3: CO-Morbidities

CO-Morbidities	No of cases	%
Pih	14	11.6
GDM	12	10
Hypothyroid	26	21.6
Anemia	18	15
Infections (UTI, Bacterial vaginosis)	18	15
Polyhydramnios	3	2.5
Oligohydramnios	7	5.8
PROM	13	10.8
Nil	47	39.1

Table 4: Current pregnancy

Current pregnancy	No. of cases	%
1 prev LSCS	109	90.8
2 prev LSCS	11	9.2
≥3prev LSCS	0	0

Table 5: Inter-delivery Interval

Inter-Delivery Interval	No. of cases	%
<2 years	28	23.3
>2 years	92	76.7

Another important risk factor noted was inter-delivery interval <24 months in 23.3%. This might be due to heavy weight lifting, sexual contact, infections (15%) peri or postpartum (6 weeks) in first cesarean delivery include chorioamnionitis, postpartum infection including wound infection, urinary tract infection, endometritis, or infection of unknown origin, history of fever in puerperium.

Table 6: In labour and Birth weight

In labour	No. of cases	%	Birth weight	No. of cases	%
YES	83	69.2	>2.5 kg	97	80.8
NO	37	30.8	<2.5 kg	23	19.2

Discussion

Diagnosis of uterine scar dehiscence after vaginal delivery is difficult because of its ambiguous appearance. The main sonographic feature of uterine scar dehiscence is the absence of myometrium and an anechoic area where the serosal layer is intact and protrudes through the lower cesarean scar. Cesarean section rates are increasing worldwide. Cesarean section, especially repeat cesarean section, is associated with an increased risk of uterine rupture, placental implantation abnormalities, placental abruption, and uterine scar dehiscence in subsequent pregnancies [8]. Cesarean section is defined as the delivery of a fetus through a surgical incision through the abdominal wall and an intact uterus. Currently, 18.6% of all births are delivered by cesarean section. In the

least developed and most developed regions, the range is between 6% and 27.2% [9]. One of the most common indications for cesarean section is a previous cesarean section. A notable complication of cesarean section is uterine scar dehiscence (USD), in which scar tissue from a previous cesarean section breaks down and detaches. Although USD is not precisely defined, the reported incidence of this condition ranges from 0.2% to 4.3% of all pregnancies associated with a previous cesarean section [10]. The most important complication of USD is uterine rupture, which occurs in approximately 1 in 16,000 to 19,000 women who have not undergone prior uterine surgery [11]. Uterine scar dehiscence is generally understood as an incomplete scar breakdown in which the serosa remains intact and the fetus, placenta, and umbilical cord remain in the uterine cavity [5]. This finding may be related to the time required for proper scar healing. Anemia was also found to be a risk factor for uterine scar dehiscence (15%). This may be due to previous poor scar healing, short birth interval, or postpartum infection.

In the age groups, maximum uterine scar dehiscence were noted in age group of 20-25 years (38.3%) and 26-30 years (34.1%) and the number of pregnancies are also seen more in these age groups. however significant number of uterine scar dehiscence were noted in age group 31-35 years (24.1%). Usually, it is a clinically occult benign condition identified accidentally at elective repeat caesarean delivery. Compared to complete uterine rupture, uterine dehiscence has much lower maternal and neonatal morbidity. The cause for a uterine scar dehiscence is based on the etiology behind the uterine scar defect or any event that would predispose the cesarean scar to dehisce. The incidence of uterine rupture after a lower segment transverse caesarean section is about 1%, low vertical scar 1-7% and following a J, inverted T incision or previous classical caesarean is 4-9% [7, 11]. Risk of uterine rupture increases with the number of previous caesarean sections. Overall reported rate of uterine rupture after one caesarean is 0.7-0.9% and 0.9-1.8% after two or more caesarean sections [12]. Short inter-delivery interval between the caesarean section and the subsequent pregnancy increases the incidence of scar dehiscence and rupture. The rate of rupture increases from 1.3-4.8% when the inter-delivery interval is more than 24 months and less than 18 months, respectively [13]. Induction of labor with oxytocins and prostaglandins also increases the risk compared to women labouring spontaneously [14]. History of fever in puerperium or woud infection following caesarean. Instrumental delivery, placental implantation over scar, and multiple pregnancy are factors in the current pregnancy which raise the risk of rupture. The rate of uterine scar dehiscence was found to be associated with increased pre-term delivery, around 30.8% in our study. This leaded to increased neonatal pre-term delivery, low birth weight (19.1%) and NICU admissions. Ramadan MK *et al*. found 33.3% association of uterine scar dehiscence and pre-term delivery. Other studies also reported similar finding. Bashiri *et al*. found that preterm delivery is an independent risk factor of uterine scar dehiscence [5].

They suggested an association between preterm delivery and uterine infection/inflammation that may have simultaneously led to weakness of the uterine scar. Another important risk factor noted was inter-delivery interval <24 months in 23%. This may be due to heavy weightlifting, sexual contact, pre- or postpartum (6 weeks) infections at first cesarean section including chorioamnionitis (15%), postpartum infections including wound infection, urinary tract infection, endometritis or infection of unknown origin. Postpartum fever in medical history. Bujold *et al*. reported that 10.5% of dehiscences occurred in patients with a birth interval of less than 24 months compared to 3 cases in patients with a birth interval of 24 months. Roberge *et al*. in their study found that single or double closure of deep transverse cesarean section did not affect uterine scar dehiscence [15]. No serious adverse outcomes occurred during the study period, which may indicate that obstetric complications were adequately managed, and may also be due to the small number of cases included in the study. In addition, there are other factors associated with uterine dehiscence that should be further investigated in future studies. Whether measurements in the second and third trimesters are sufficient will also require further research. Finally, uterine rupture outside of labor is a very rare complication after cesarean section and was not included in our study.

Conclusion

Uterine scar dehiscence is an incidental finding during repeat cesarean section. However, it is significantly associated with NICU admission and low birth weight of the newborn. To reduce the incidence of uterine scar dehiscence, it is important to identify and prevent risk factors. However, it was significantly associated with admission to the NICU and low birth weight of the newborn. This may be explained by the fact that more premature babies were in the uterine scar dehiscence group. Therefore, to reduce the incidence of uterine scar dehiscence, it is important to prevent risk factors such as preterm birth, prevent anemia, and treat infections such as urinary tract infections in women with a history of cesarean delivery.

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