Original Article
DOI: https://doi.org/10.70749/ijbr.v3i2.656

INDUS JOURNAL OF BIOSCIENCE RESEARCH
https://induspublishers.com/IJBR
ISSN: 2960-2793/ 2960-2807

Frequency of Uterine Scar Dehiscence Positive Scar in Women with Previous One Cesarean Section

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ARTICLE INFO

Keywords

Uterine Scar Dehiscence, Cesarean Section, Hypertension, Parity.

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Declaration

Authors' Contribution: All authors equally contributed to the study and approved the final manuscript. *Detail is given at the end.

Conflict of Interest: No conflict of interest.

Funding: No funding received by the authors.

Article History

Received: 09-10-2024
Revised: 17-01-2025
Accepted: 04-02-2025

ABSTRACT

Background: Uterine scar dehiscence is a significant complication in women with a history of cesarean section, with implications for maternal and fetal health. Identifying risk factors and early detection is crucial for improving outcomes. While various demographic and clinical factors have been implicated, the association between maternal age, gestational age, parity, and hypertension with uterine scar dehiscence has not been fully explored in the local population. **Objective:** To determine the frequency of uterine scar dehiscence in women with previous one cesarean section. **Study Design:** Cross-sectional study. **Duration and Place of Study:** The study was conducted from January 2024 to July 2024 at a Mardan Medical Complex in Mardan, Pakistan. **Methodology:** A total of 109 women aged 18–40 years, with a singleton pregnancy of >32 weeks gestation and abdominal pain, were included. Ultrasound was performed by a senior consultant radiologist to assess uterine scar dehiscence, with clinical criteria based on scar tenderness and specific ultrasound findings. **Results:** The overall incidence of uterine scar dehiscence was 13.8%, with higher rates observed in women over 30 years (23.6%), those with a gestational age >39 weeks (47.6%), and women with higher parity (>4; 48%). Significant associations were found between uterine scar dehiscence and maternal age ($p=0.004$), gestational age ($p<0.001$), parity ($p<0.001$), and hypertension ($p<0.001$). No significant association was found with diabetes ($p=0.701$). **Conclusion:** The study concludes uterine scar dehiscence is a significant complication in women with prior cesarean sections, influenced by factors like age, parity, and hypertension, emphasizing the need for further research and protocols.

INTRODUCTION

A cesarean section is a surgical delivery by which an infant is born through incisions made in both the mother's abdominal wall and the uterus.[1] The procedure is commonly used when vaginal delivery will endanger the mother's or infant's health. Pfannenstiel incision is done by a horizontal incision in the lower abdomen, as this procedure is supported by fewer complications and better healing.[2] A vertical incision is sometimes needed in some conditions, particularly in the case of emergency or for specific medical conditions.[3] Although regarded to be overall safe, cesarean sections necessarily carry risks, including infection, bleeding, and longer recovery time from vaginal delivery.[4]

Women who have had a cesarean section have some problems in future pregnancies, especially with the uterine wall scar.[5] One of the serious problems is the risk of complications, such as placenta accreta, placenta previa, and rupture of the uterus.[6] These are complications because the fibrotic tissue developed as a result of the earlier surgery may not be sufficient to support the stretching of the uterine wall during pregnancy, leading to points of weakness of the uterine wall.[7] Trying to deliver vaginally after a previous cesarean also carries serious risks, especially the risk of uterine rupture along the line of the scar, which threatens both maternal and fetal health. Good communication with health workers and close monitoring during the pregnancy are essential to reduce these risks and achieve the best possible outcome for the mother and the baby.[8]

Uterine scar dehiscence is defined as partial disruption of the uterine scar from a prior cesarean delivery, without complete thickness disruption of the uterine wall.[9] It is more frequent than complete uterine rupture but is typically asymptomatic and can be found incidentally on routine ultrasounds or repeat cesarean delivery.[10] Although it is not always immediately dangerous, scar dehiscence does predispose to complications in future pregnancies, especially if the

remaining myometrium over the scar becomes significantly attenuated.[11] When symptoms do occur, they may be in the form of mild abdominal pain or irregular contractions; however, in more severe forms, it can advance to uterine rupture, requiring emergent medical treatment.[12] To reduce the risk of scar dehiscence, women with a history of cesarean delivery should undergo intensive prenatal care consisting of routine imaging studies to assess the integrity of the uterine scar and to guide decisions regarding the best mode of delivery in future pregnancies.

Study conducted by Khan FK and colleagues revealed that among women who had undergone a single prior cesarean section, the occurrence rate of uterine scar dehiscence was 23.75%.[13]

Understanding the prevalence of uterine scar dehiscence in women with a history of one previous cesarean section is crucial for improving obstetric care. By identifying the frequency, healthcare providers can better anticipate and manage risks during subsequent pregnancies and deliveries. This research will enhance patient safety and guide clinical decision-making for women considering vaginal birth after cesarean (VBAC) or planning future pregnancies.

METHODOLOGY

A cross sectional investigation was being done from January 2024 to July 2024 of Obstetrics and Gynecology department of Mardan Medical Complex in Mardan. The study involved 109 women. Statistical software was used to determine the sample size, determining a 95% confidence level, a margin of error of 7% and an existing prevalence in all of the women with prior cesarean delivery of uterine scar dehiscence of 23.75%.[13]

A consecutive sampling technique based on non-probability was adopted in the recruitment of the study population. The inclusion criteria were women of 18-40 years of age, singleton pregnancy on ultrasound, gestational age of more than 32 weeks by the last menstrual period, parity one or more, and abdominal pain at presentation. The study excluded patients with a history of placenta accreta, placenta previa, placenta increta, or renal disease.

Ethics approval was provided by the ethics committee of the hospital. Informed consent was taken from all the participants after discussing the benefits and risks of the study. Demographic details such as age, gestational age, parity, residence, occupation, education, socioeconomic status, diabetes mellitus, and hypertension were noted.

All the patients were subjected to an ultrasound scan to assess for uterine scar dehiscence. The ultrasound scan was done by a senior consultant radiologist with four years of experience. The results of uterine scar dehiscence were considered as spontaneous or pain on palpation at the site of the scar (VAS>3) and presence of any two or more of the following specific ultrasound findings. These included protrusion of the amniotic sac, endometrial or myometrial defect, and fetal structures in the peritoneal cavity. This definition was used in consideration to determine positive scar tenderness. All the results were documented and finalized in a specially designed case report form. IBM SPSS version 26 was utilized for data analysis. Qualitative variables such as residence place, occupation, level of education, socioeconomic status, diabetes mellitus, hypertension, and presence of the uterine scar dehiscence were reported as frequencies and percentages. Age, gestational age, and parity in quantitative variables were expressed as means and standard deviations. Certain factors were analyzed in relation to incidence of uterine scar dehiscence, including age, gestation age, parity, diabetes, and hypertension. The chi square test was used to assess associations after stratification, and p-value ≤ 0.05 will be computationally significant.

RESULTS

The mean age of study participants was 30.5 years with a standard deviation of 3.71 years. The average gestational age was 36.5 weeks (SD 2.83 weeks). Average parity was 3.33 with a standard deviation of 1.57. Of the 109 women interviewed, a majority of 71 women (65.1%) resided in rural areas while 38 (34.9%) lived in urban settings. As for educational background, 26 (23.9%) were illiterate, 52 (47.7%) had received primary education, 26 (23.9%) completed secondary education, and 5 (4.6%) had higher education. Ninety-six (88.1%) were housewives and thirteen (11.9%) were employed. In terms of socioeconomic status, 42 (38.5%) were poor, 49 (49.5%) middle class, 13 (11.9%) wealthy. Diabetes in 17 (15.6%) and hypertension in 18 (16.5%) participants were comorbid conditions. (as shown in Table-I).

Table I

Patient Demographics

Demographics		Mean ± SD / n (%)
Age (years)		30.495±3.71
Gestational age (weeks)		36.495±2.83
Parity		3.330±1.57
Residence	Rural	71 (65.1%)
	Urban	38 (34.9%)
Residence	Uneducated	26 (23.9%)
	Primary	52 (47.7%)
	Secondary	26 (23.9%)
	Higher	5 (4.6%)
Occupation	Housewife	96 (88.1%)
	Job	13 (11.9%)
Socioeconomic Status	Poor	42 (38.5%)
	Middle	54 (49.5%)
	Rich	13 (11.9%)
Comorbidities	Diabetes	17 (15.6%)
	Hypertension	18 (16.5%)

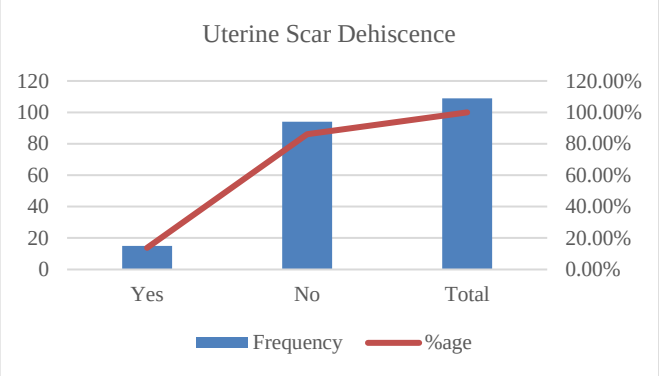
The frequency of uterine scar dehiscence was 15 cases (13.8%) out of a total of 109 patients, indicating that the majority of patients did not experience this complication (94 cases, 86.2%) (as shown in Table-II).

Table II

Uterine Scar Dehiscence

Uterine Scar Dehiscence	Frequency	%age
Yes	15	13.8%
No	94	86.2%
Total	109	100%

Figure 1



The association of uterine scar dehiscence with demographic factors revealed significant differences. For age, patients aged over 30 years had a higher frequency of uterine scar dehiscence (13 out of 55, 23.6%) compared to those aged 18-30 years (2 out of 55, 3.7%), with a p-value of 0.004. In terms of gestational age, patients with gestational age over 39 weeks had a much higher frequency of uterine scar dehiscence (10 out of 21, 47.6%) compared to those with gestational age between 32-39 weeks (5 out of 88, 5.7%), with a p-value of less than 0.001. For parity, patients with parity greater than 4 had a higher frequency of uterine scar dehiscence (12 out of 25, 48%) compared to those with parity between 1-4 (3 out of 84, 3.6%), with a p-value of less than 0.001. The presence of diabetes did not show a significant association with uterine scar dehiscence (p-value 0.701), while hypertension had a significant association, with a higher frequency of uterine scar dehiscence in patients with hypertension (11 out of 18, 61.1%) compared to those without (4 out of 91, 4.4%), with a p-value of less than 0.001 (as shown in Table-III).

Table III

Association of Uterine Scar Dehiscence with Demographic Factors

Demographic Factors		Uterine Scar Dehiscence		p-value
		YES n(%)	NO n(%)	
Age (years)	18-30	2 (3.7%)	52 (96.3%)	0.004*
	>30	13 (23.6%)	42 (76.4%)	
Gestational age (weeks)	32-39	5 (5.7%)	83 (94.3%)	<0.001*
	>39	10 (47.6%)	11 (52.4%)	
Parity	1-4	3 (3.6%)	81 (96.4%)	<0.001*
	>4	12 (48%)	13 (52%)	
Diabetes	Yes	3 (17.6%)	14 (82.4%)	0.701*
	No	12 (13%)	80 (87%)	
Hypertension	Yes	11 (61.1%)	7 (38.9%)	<0.001*
	No	4 (4.4%)	87 (95.6%)	

The correlation analysis revealed notable associations between age, gestational age, parity, and uterine scar dehiscence. A strong positive correlation was observed between age and gestational age (Pearson's r = 0.692, p < 0.001), as well as between age and parity (Pearson's r = 0.920, p < 0.001). Additionally, age exhibited a moderate negative correlation with uterine scar dehiscence (Pearson's r = -0.437, p < 0.001). Gestational age showed a strong positive correlation with parity (Pearson's r = 0.841, p < 0.001) and a moderate negative correlation with uterine scar dehiscence (Pearson's r = -0.383, p < 0.001). Similarly, parity demonstrated a strong positive correlation with gestational age (Pearson's r = 0.841, p < 0.001) and a moderate negative correlation with uterine scar dehiscence (Pearson's r = -0.478, p < 0.001) (as shown in Table-IV).

Table IV

Correlation Analysis of Age, Gestational Age, Parity, and Uterine Scar Dehiscence

		Age	Gestational age	Parity	Uterine Scar Dehiscence
Age	Pearson Correlation	1	.692**	0.920**	-0.437**
	Sig. (2-tailed)		<0.001	<0.001	<0.001
	N	109	109	109	109
Gestational age	Pearson Correlation	0.692**	1	0.841**	-0.383**
	Sig. (2-tailed)	<0.001		<0.001	<0.001
Parity	Pearson Correlation	0.920**	.841**	1	-0.478**
	Sig. (2-tailed)	<0.001	<0.001		<0.001
Uterine Scar Dehiscence	Pearson Correlation	-0.437**	-0.383**	-0.478**	1
	Sig. (2-tailed)	<0.001	<0.001	<0.001	

** Correlation is significant at the 0.01 level (2-tailed)

DISCUSSION

Our study results document incidence rate at 13.8% in 15 out of 109 patients and show that uterine scar dehiscence is a low but important rate of occurrence. In the study, women aged older than 30 years were more than 6 times more likely to develop a dehiscence of their uterine scar than young women aged 18 to 30 (3.7%; p ≤ 0.004). This result indicates that advanced maternal age might be an important risk factor for dehiscence of uterine scar. This could be explained scientifically as the physiological changes that occur with age, namely decreased tissue elasticity and an increase risk of complications during pregnancy and childbirth. There may also be a higher prevalence of comorbidities in older

women that affect the uterine integrity and the healing process. Women with a gestational age over 39 weeks presented with significantly higher incidence of uterine scar dehiscence (47.6%) than women with a gestational age between 32-39 weeks (5.7%), p<0.001. The results suggest that prolonged gestation increases the risk of uterine scar dehiscence. Women with a parity greater than 4 had a higher incidence of uterine scar dehiscence (48%) compared to those with a parity between 1-4 (3.6%), with a p-value of less than 0.001. It indicates that uterine scar dehiscence may be a major risk factor for having a second or subsequent baby. This could have a scientific explanation, as many pregnancies and deliveries could cause cumulative stress of the uterine tissues causing the scar tissue to be weaker, and hence it enables dehiscence to occur. We found that uterine scar dehiscence was significantly associated with hypertension in the presence of a p-value less than 0.001. The incidence was much higher with women having hypertension (61.1%) than those without (4.4%). This result lends support to the hypothesis that hypertension may play some role in increasing risk for uterine scar dehiscence. Hypertension can therefore be scientifically related to placental insufficiency and uteroplacental vascular changes to undermine the integrity of the uterine scar and increase the risk of uterine scar dehiscence.

In our study, the incidence of uterine scar dehiscence was found to be 13.8%, with a higher rate in patients aged over 30 years (23.6%) compared to those aged 18-30 years (3.7%), with a p-value of 0.004. This finding is consistent with the study by Sultana and Zia [14] which reported an incidence of 18.4%, also noting a higher rate in emergency cesarean sections. This suggests that older age may be associated with higher stress on the uterine scar, potentially due to physiological changes and increased risk of complications during pregnancy and childbirth. Similarly, Hina and Zeb [15] reported an incidence of 14.9% in women presenting with scar tenderness during trial of labor, indicating that scar dehiscence is relatively common in this group.

In contrast, Ramadan et al. [16] reported a lower incidence of 4.6% in women undergoing elective repeat cesarean delivery. This discrepancy could be attributed to the different study populations and settings. Elective cesarean sections are often scheduled at a time when the uterus is less likely to be under significant stress compared to emergency cases, which may explain the lower incidence of scar dehiscence in this group.

Our association findings are supported by Sultana and Zia [14] who identified previous emergency cesarean sections, higher order previous cesareans, and interpregnancy intervals of one year as significant risk factors. Ramadan et al. [16] also identified preterm delivery, tertiary cesarean delivery or higher, and short inter-delivery intervals of ≤ 24 months as significant risk factors. These factors are consistent with our findings and highlight the importance of considering the number of previous cesarean sections, gestational age, and hypertension when assessing the risk of uterine scar dehiscence.

Hussain et al. [17] reported similar risk factors, including prolonged second stage of labor, short interpregnancy intervals, and hypertension. These factors are consistent with the broader literature on uterine scar dehiscence, indicating that prolonged labor and short intervals between pregnancies can place additional stress on the uterine scar, potentially leading to dehiscence.

In our study, we found that the incidence of uterine scar dehiscence was higher in women with higher gestational age, higher parity, and hypertension. This aligns with the findings of Sultana and Zia [14] and Ramadan et al. [16] suggesting that these factors should be prioritized in clinical assessments. Additionally, the presence of scar tenderness, as noted by Hina and Zeb [15] should be taken seriously as it may indicate an increased risk of dehiscence.

The fact that incidence rates vary within as well as between different studies as depends on the identification of certain risk factors, underscores that clinical strategies should be tailored to prevent uterine scar dehiscence in women who have had a previous cesarean section. Since sub optimally controlled pregnancies in this high risk group might have important modifiable risk factors such as interpregnancy intervals and hypertension, future research should be directed towards the development of standardized protocols for monitoring and managing pregnancies in this group.

The limitations of current studies including single center design should also be acknowledged for possible reduced generalizability of the findings. Furthermore, the sample size was small by both traditional academic standards as well as by the standards of studies conducted in the health professions. Therefore, future research should focus on these limitations and conduct multicenter studies with bigger sample size from prospective data collection to produce well founded knowledge to be exploited in the context of clinical practice.

CONCLUSION

Thus, our study ends with the conclusion that uterine scar dehiscence is a significant complication in women with a previous cesarean section and that it is influenced by factors such as advanced maternal age, higher parity or hypertension. The findings in these pregnancies underscore the importance of continued vigilance and treatment in high risk pregnancies to minimize complications. Studies on developing standardized protocols for pregnant women in this high-risk group

with a special emphasis on modifiable risk factors should be done in the future.

Acknowledgments
We are most grateful to the medical staff of the Department which maintained very meticulous records and took very efficient care in handling patient information. Both admirable and well appreciated, their efforts.

Author Contributions
Each author has played a significant role in shaping this manuscript.
Dr. Mehwish spearheaded the study's design, wrote the initial draft, and coordinated the collection of hospital data.
Dr. Samina Jadoon provided valuable input during the study's planning stages and was instrumental in analyzing and interpreting the data.

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