



Comparison of Frequency of Burst Abdomen in Diabetic and Nondiabetic Women

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ABSTRACT

Background: Burst abdomen, or postoperative wound dehiscence, is a serious complication of abdominal surgeries, particularly cesarean sections. **Objective:** To compare the frequency of burst abdomen in diabetic and nondiabetic women after cesarean section and assess the associated risk. **Methods:** This cohort study was conducted in the Department of Obstetrics and Gynecology at Shaikh Zaid Women Hospital, Larkana from Nov 2024 to March 2025. A total of 220 women aged 18–40 years undergoing cesarean section at ≥ 37 weeks gestation was included, with 110 diabetics and 110 nondiabetics. Data on demographic variables, intraoperative findings, and postoperative wound status were collected. **Results:** The overall frequency of burst abdomen was 7.3%. Among diabetic women, 10.9% developed burst abdomen compared to 3.6% in nondiabetics ($p = 0.042$). The relative risk was 3.03 (95% CI: 1.00–9.13), indicating that diabetic women were three times more likely to develop burst abdomen. Higher risk was also observed in patients with BMI ≥ 28 kg/m², emergency cesarean sections, and operative time ≥ 60 minutes. **Conclusion:** It is concluded that diabetic women are at significantly higher risk of developing burst abdomen following cesarean section. Early identification, preoperative risk assessment, and optimal perioperative glycemic control are critical to improving surgical outcomes in this high-risk population.

INTRODUCTION

Burst abdomen, also referred to as postoperative wound dehiscence or abdominal wound disruption, is a severe and potentially life-threatening complication of abdominal surgery. It is defined as the separation of the layers of a surgical wound, particularly the fascial layer, and may be partial (confined to superficial tissues) or complete (leading to evisceration of abdominal contents) [1]. The condition typically presents within the first 7–10 days after laparotomy and demands immediate surgical attention. The incidence of burst abdomen ranges from 0.2% to 5% globally, but the outcomes are often grave, with mortality rates reaching up to 25% in some studies due to secondary infection, sepsis, or multi-organ failure [2]. Pregnancy affects both the maternal and fetal metabolism and even in nondiabetic women exerts a diabetogenic effect [3]. Among pregnant women, 2 to 17.8% develop gestational diabetes. ¹ Diabetes in pregnancy has been shown to increase the risk of perinatal mortality, morbidity and congenital anomalies. Risks of adverse outcomes are not constant across all types of diabetes; women with type 1 diabetes typically have the highest rate of adverse outcomes, followed by women with type 2 diabetes and women with gestational diabetes [2,3]. Dehiscence of abdominal wound is easily the most

notorious complication observed in abdominal surgery. It is disturbing for both to the patient and the treating surgeon. Abdominal wound dehiscence has significant impact on health care cost, both for patients and hospitals. Its mortality rates reported as high as 15% - 45% [4]. Diabetes is an important risk factor for surgical incision infection, and for cesarean section, diabetes is an important risk factor for maternal postoperative wound infection as well [5,6]. In a study, it was reported that burst abdomen was present in 10% of diabetics and 2% in non-diabetics after cesarean section ($p < 0.05$) [7]. Despite the biological plausibility and clinical suspicion linking diabetes with poor wound healing outcomes, especially burst abdomen, there remains a paucity of localized, sex-specific, comparative data on this subject. Most previous studies have either been general cohort analyses or have not adequately stratified by diabetic status or gender [8]. Furthermore, much of the available literature lacks focus on South Asian populations, who may present unique genetic predispositions, nutritional profiles, and surgical care challenges [9].

Rationale of this study is to determine the association of burst abdomen with gestational diabetes mellitus after cesarean section. Through literature, it has been observed that gestational diabetes mellitus is significantly

associated with burst abdomen. But not much data has been reported earlier in literature regarding the effect of gestational diabetes mellitus on occurrence of burst abdomen. Therefore, we have planned to conduct this study to confirm the association of gestational diabetes mellitus with burst abdomen in the local setting and implement results in local context, so that in future we can implement the improved maternal care management system to prevent gestational diabetes mellitus and its related complications during or after delivery in local clinical set-up.

Objective

To determine the association of burst abdomen with gestational diabetes mellitus after cesarean section.

METHODOLOGY

This cohort study was conducted in the Department of Obstetrics and Gynecology at Shaikh Zaid Women Hospital, Larkana from Nov 2024 to March 2025.

Sample Size Calculation

A total of 220 women were enrolled, with 110 participants in each group (diabetic and nondiabetic). The sample size was calculated using a significance level of 5%, power of 80%, and expected frequencies of burst abdomen of 10% in diabetic patients and 2% in nondiabetic patients after cesarean section. Participants were selected using a non-probability, consecutive sampling technique.

Inclusion Criteria

Inclusion criteria comprised women aged 18 to 40 years, with parity less than five, undergoing cesarean section at a gestational age greater than 37 weeks (based on last menstrual period), and operated under spinal anesthesia. Women with gestational diabetes constituted the exposed group, while those without any form of diabetes were included in the unexposed group.

Exclusion Criteria

Exclusion criteria included women undergoing concurrent surgeries (such as liposuction), those classified as ASA grade III or IV, patients with pre-existing diabetes diagnosed before pregnancy or during the first trimester, hypertensive women (blood pressure >140/90 mmHg), and those with renal dysfunction (serum creatinine >1.8 mg/dL).

Data Collection Procedure

After obtaining ethical clearance, eligible patients were identified and recruited from the operating theatre. Informed written consent was obtained from all participants. Demographic and clinical data, including age, height, weight, body mass index (BMI), parity, gestational age at delivery, previous cesarean section, hemoglobin level, and type of cesarean section (emergency or elective), were recorded. Intraoperative parameters, such as duration of surgery and estimated blood loss, were documented. Patients were categorized into two groups based on the presence or absence of gestational diabetes. All data were recorded using a structured proforma. Postoperatively, participants were monitored in the surgical wards and followed up in the outpatient department for 15 days. On postoperative days 10 to 15,

wound assessments were performed. In cases where the wound appeared clean and intact, sutures were removed. If patients presented with symptoms such as severe abdominal pain, fever, wound gaping, or visible evisceration of internal contents, the condition was diagnosed as burst abdomen, in accordance with the study's operational definition.

Statistical Analysis

Data were analyzed using SPSS version 25. The Shapiro-Wilk test was applied to assess the normality of continuous variables. Quantitative variables, including age, BMI, gestational age, hemoglobin level, operative duration, and blood loss, were presented as mean \pm standard deviation. Categorical variables, such as parity, previous cesarean section, type of cesarean section, and occurrence of burst abdomen, were summarized using frequencies and percentages. A 2 \times 2 contingency table was used to determine the association between gestational diabetes and burst abdomen, and relative risk (RR) was calculated. An RR greater than one was considered statistically significant. Data were stratified by age, gestational age at delivery, BMI, parity, previous cesarean section, hemoglobin level, type of cesarean section, operative duration, and blood loss. Post-stratification analysis was conducted using additional 2 \times 2 tables within each stratum, and RR was recalculated to assess consistency of associations.

RESULTS

Data were collected from 110 patients. The mean age was 30.2 \pm 4.5 years in the diabetic group and 29.7 \pm 4.3 years in the nondiabetic group ($p = 0.412$), showing no significant difference. BMI was significantly higher in diabetics (29.1 \pm 2.8 kg/m²) compared to nondiabetics (27.6 \pm 2.4 kg/m²; $p = 0.001$). Intraoperative blood loss was also greater in the diabetic group (410 \pm 58 mL) versus the nondiabetic group (395 \pm 50 mL; $p = 0.041$). Other variables such as gestational age at delivery (38.5 \pm 1.1 vs. 38.7 \pm 1.0 weeks; $p = 0.210$), hemoglobin (10.6 \pm 1.2 vs. 10.8 \pm 1.1 g/dL; $p = 0.284$), parity <3 (68.2% vs. 72.7%; $p = 0.468$), previous cesarean section (36.4% vs. 33.6%; $p = 0.683$), emergency cesarean rates (50.0% vs. 47.3%; $p = 0.707$), and operative time (61.4 \pm 9.6 vs. 59.8 \pm 8.7 minutes; $p = 0.152$) were statistically non-significant.

Table 1

Demographic and Baseline Characteristics of Study Participants (N = 220)

Variable	Diabetic Group (n = 110)	Nondiabetic Group (n = 110)	p-value
Age (years)	30.2 \pm 4.5	29.7 \pm 4.3	0.412
BMI (kg/m ²)	29.1 \pm 2.8	27.6 \pm 2.4	0.001*
Gestational Age at Delivery (weeks)	38.5 \pm 1.1	38.7 \pm 1.0	0.210
Hemoglobin (g/dL)	10.6 \pm 1.2	10.8 \pm 1.1	0.284
Parity < 3 (n, %)	75 (68.2%)	80 (72.7%)	0.468
Previous C-Section (n, %)	40 (36.4%)	37 (33.6%)	0.683
Type of C-Section (Emergency)	55 (50.0%)	52 (47.3%)	0.707
Operative Time (minutes)	61.4 \pm 9.6	59.8 \pm 8.7	0.152
Intraoperative Blood Loss (mL)	410 \pm 58	395 \pm 50	0.041*

*p < 0.05 considered statistically significant

Out of 220 women, the overall frequency of burst abdomen was 7.3% (n = 16). In the diabetic group, 12 out of 110 women (10.9%) developed burst abdomen, compared to 4 out of 110 women (3.6%) in the nondiabetic group.

Table 2

Frequency of Burst Abdomen in Diabetic and Nondiabetic Women

Group	Burst Abdomen (n)	No Burst Abdomen (n)	Total (n)	Frequency (%)
Diabetic	12	98	110	10.9%
Nondiabetic	4	106	110	3.6%
Total	16	204	220	7.3%

Relative Risk (RR) = 3.03, 95% CI = 1.00–9.13, p-value = 0.042

Among women with operative time less than 60 minutes, the frequency of burst abdomen was 6.1% (4/66) in diabetics and 2.0% (1/50) in nondiabetics. However, when the operative time was 60 minutes or more, the frequency increased to 18.2% (8/44) in diabetics compared to 5.0% (3/60) in nondiabetics. Similarly, in women with BMI < 28 kg/m², burst abdomen occurred in 6.7% (3/45) of diabetics and 2.1% (1/48) of nondiabetics. For those with BMI ≥ 28 kg/m², the frequency rose to 13.8% (9/65) in diabetics versus 4.8% (3/62) in nondiabetics.

Table 3

Stratified Analysis by Operative Time and Diabetes Status

Operative Time	Diabetes Status	Burst Abdomen (n)	Total in Subgroup (n)	Frequency (%)
< 60 minutes	Diabetic	4	66	6.1%
	Nondiabetic	1	50	2.0%
≥ 60 minutes	Diabetic	8	44	18.2%
	Nondiabetic	3	60	5.0%
BMI Category				
BMI < 28 kg/m ²	Diabetic	3	45	6.7%
	Nondiabetic	1	48	2.1%
BMI ≥ 28 kg/m ²	Diabetic	9	65	13.8%
	Nondiabetic	3	62	4.8%

In elective cesarean sections, burst abdomen occurred in 5.5% (3/55) of diabetic women and 1.7% (1/58) of nondiabetic women. In contrast, among emergency cases, the frequency rose to 16.4% (9/55) in diabetics and 5.8% (3/52) in nondiabetics.

Table 4

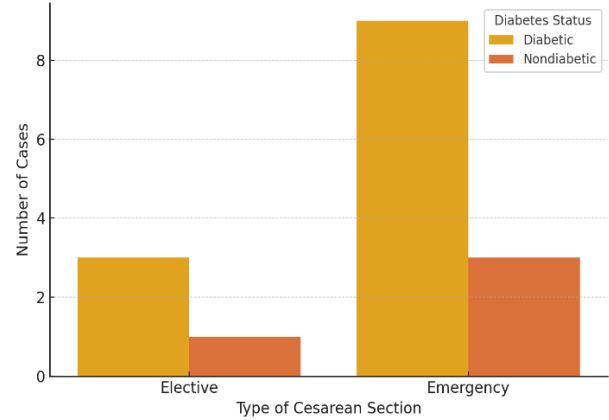
Frequency of Burst Abdomen by Type of Cesarean Section

Type of Cesarean Section	Diabetes Status	Burst Abdomen (n)	Total (n)	Frequency (%)
Elective	Diabetic	3	55	5.5%
	Nondiabetic	1	58	1.7%
Emergency	Diabetic	9	55	16.4%
	Nondiabetic	3	52	5.8%

Postoperative wound assessment on days 10 to 15 revealed that the majority of wounds were clean and dry in both groups, with 76.4% (84/110) in diabetics and 87.3% (96/110) in nondiabetics. Mild serous discharge was observed in 7.3% (8/110) of diabetic and 5.5% (6/110) of nondiabetic patients, while localized redness was noted in 5.5% (6/110) of diabetics and 3.6% (4/110) of nondiabetics. Burst abdomen was diagnosed in 10.9% (12/110) of diabetic women compared to 3.6% (4/110) in nondiabetics.

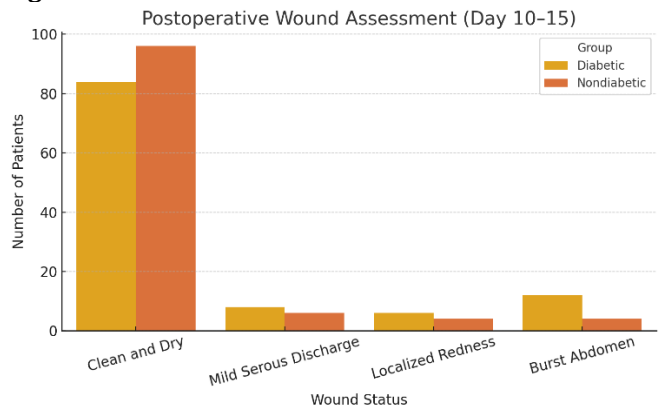
Figure 1

Burst Abdomen by Type of Cesarean Section and Diabetes Status

**Table 5**

Postoperative Wound Assessment Findings (Day 10–15)

Wound Status	Diabetic Group (n = 110)	Nondiabetic Group (n = 110)	Total (n = 220)
Clean and Dry	84 (76.4%)	96 (87.3%)	180 (81.8%)
Mild Serous Discharge	8 (7.3%)	6 (5.5%)	14 (6.4%)
Localized Redness	6 (5.5%)	4 (3.6%)	10 (4.5%)
Burst Abdomen Diagnosed	12 (10.9%)	4 (3.6%)	16 (7.3%)

Figure 2

DISCUSSION

This study was conducted to compare the frequency of burst abdomen in diabetic and nondiabetic women undergoing cesarean section. The results demonstrated a significantly higher frequency of burst abdomen among diabetic women (10.9%) compared to their nondiabetic counterparts (3.6%), with a relative risk of 3.03 and a statistically significant p-value of 0.042. These findings suggest that gestational diabetes substantially increases the risk of postoperative wound dehiscence following cesarean delivery [10]. The increased incidence of burst abdomen in diabetic patients observed in our study aligns with prior literature that identifies impaired wound healing as a hallmark complication of hyperglycemia. Diabetes is known to alter several aspects of the normal wound healing process, including neutrophil function, collagen deposition, angiogenesis, and epithelialization. Additionally, diabetic patients are more susceptible to subclinical infections and microvascular dysfunction, further compromising wound integrity [11].

Stratified analysis reinforced the elevated risk of burst abdomen in diabetic women across multiple clinical subgroups. Notably, patients with higher BMI (≥ 28 kg/m²), prolonged operative times (≥ 60 minutes), and emergency cesarean sections showed an even greater frequency of wound complications [12]. For instance, among women undergoing emergency cesarean sections, the frequency of burst abdomen in diabetics rose to 16.4% compared to 5.8% in nondiabetics [13]. This suggests that, in addition to diabetes, surgical urgency and prolonged operative stress are significant contributing factors to wound dehiscence. The association between high BMI and burst abdomen was also evident. Obesity, independently and in combination with diabetes, can exacerbate wound tension and increase intra-abdominal pressure, both of which are mechanical risk factors for fascial dehiscence [14-16]. Furthermore, adipose tissue has lower vascularity, which impairs oxygen delivery and nutrient support at the surgical site. Postoperative wound assessment revealed that diabetic women had a higher incidence of subclinical wound issues, including serous discharge and localized redness, in addition to overt burst abdomen [17]. These early signs may serve as clinical indicators for heightened monitoring and intervention in at-risk populations. The data also suggest that emergency

cesarean sections, with their associated intraoperative time pressures and possibly less optimized surgical conditions, may contribute to higher complication rates, particularly in metabolically compromised individuals [18]. Despite the strengths of our study, including a well-defined cohort and standardized follow-up protocol, several limitations should be acknowledged. The use of a non-probability sampling technique may introduce selection bias, and the single-center setting may limit generalizability. Moreover, glycemic control levels (e.g., HbA1c) were not assessed, which could have provided further insight into the correlation between metabolic control and wound outcomes.

CONCLUSION

It is concluded that the frequency of burst abdomen is significantly higher in diabetic women as compared to nondiabetic women following cesarean section. The presence of gestational diabetes was associated with a threefold increased risk of postoperative wound dehiscence. This risk was further elevated in subgroups with high body mass index, prolonged operative times, and emergency cesarean deliveries. These findings underscore the importance of recognizing gestational diabetes as an independent risk factor for poor surgical wound outcomes.

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