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RISKS ASSOCIATED WITH UNSCHEDULED C-SECTIONS PREVIOUS PLANNED DATES IN A TERTIARY CARE HOSPITAL, MUZAFFARABAD: A RETROSPECTIVE COHORT STUDY

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Abstract

Background: Existing prediction tools for cesarean sections, whether scheduled or emergency, have relied on factors identified before and during labor.

Aim of the Study: The research focused on women with one viable fetus who underwent planned cesarean delivery at a tertiary care hospital, in Muzaffarabad.

Material and Methods: The retrospective cohort study gathered data from the hospital's medical records from February 2021 to September 2021. Women who had cesarean deliveries during this time and data was collected on their demographics, types of surgery, any existing health conditions, and details about the births.

The study also looked into the outcomes for both the mothers and the newborns after these deliveries, particularly comparing urgent and planned cesarean deliveries. A multivariate analysis was carried out to identify any factors related to cesarean deliveries that were performed earlier.

Results: The average age was significantly lower in the urgent cesarean group (30±5.3 years) compared to the elective cesarean group (31.4±5.1 years) with a p-value of 0.001. The gestational age at delivery was significantly shorter in the urgent cesarean group (37.5±1.8 weeks) than in the elective group (38.7±1.1 weeks, p<0.001).
Gestational hypertension and a history of previous cesarean sections are both associated with increased odds of early cesarean deliveries (AOR 1.87, 95% Confidence interval (CI) 1.24 to 2.81, with a p-value of 0.002) and (AOR 1.34, 95% Confidence interval of 95%1.01 to 1.78, with a p-value of 0.043). Fetal distress appeared as the strongest predictor, significantly raising the odds of early cesarean deliveries (AOR 3.12, 95% CI 95%, 2.15 to 4.53, with a highly significant p-value less than 0.001

Conclusion: Recent research reveals the factors that increase the risks and health issues for both the mother and fetus when elective cesarean deliveries need to be performed earlier than planned. Doctors should consider this when scheduling the cesarean delivery.

Keywords: Cesarean surgery, elective surgery, urgent surgery

Introduction

Cesarean delivery (CD) is a widely performed surgical procedure globally. The number of Cesarean deliveries has almost doubled over the years (1,2), and research in the United States has shown an increase from 16 million in 2000 to 29.7 million in 2015 (3).
Emergency cesarean deliveries are performed when certain worrisome signs emerge, like an irregular fetal heart rate, difficulties during labor, or issues with the baby's position in the birth canal. These situations may put both the mother and baby at risk if continue. (4–6). Planned elective cesarean delivery is suggested when it is expected to result in a more favorable outcome for the mother or baby compared to vaginal delivery(5). Common medical and obstetrical reasons for choosing elective cesarean delivery include a history of prior cesarean delivery, a baby in breech, and carrying more than one baby, although reasons may vary based on local and national guidelines.
Doctors must carefully consider the potential risks and advantages for both the mother and newborn when planning an elective cesarean delivery. It is generally preferable to perform a cesarean delivery in the later of pregnancy to minimize any complications for the baby. (7–9). Recent research indicates that the likelihood of newborns developing respiratory distress syndrome and transient tachypnea decreases as the planned cesarean section (CD) is scheduled at a later gestational age, specifically between 37 to 40 weeks. (10–12). Conversely, it is advised to perform elective cesarean delivery as early as possible to prevent the occurrence of unplanned labor, which could result in the need for an urgent, unscheduled CD. Urgent CD carries a higher risk of maternal complications such as pelvic organ damage, excessive bleeding requiring blood transfusions, complications at the wound site, and prolonged hospital stay. (13,14). The National Institute of Health and Care Excellence and the American College of Obstetricians and Gynecologists both advise that cesarean delivery should be scheduled between 39 and 40 weeks of pregnancy unless there are medical reasons for an earlier delivery (15).

Material and Methods

It was a retrospective cohort study. Data was collected from the medical records of the tertiary care hospital in Muzaffarabad. Women who underwent Cesarean Delivery from February 2021 to September 2021. Information was extracted from electronic health records covering patient demographics, surgery types, comorbidities, and birth characteristics of women who underwent elective or emergency cesarean delivery, newborns, and postpartum mothers who had undergone urgent or elective cesarean deliveries performed before the scheduled date.
Data will be analyzed using SPSS V25.0. Descriptive statistics will be used for baseline characteristics and birth characteristics. The sample size required for the study was calculated with

the help of the WHO sample size calculator by keeping the parameters including 95% CI, 10% anticipated population, and 5% absolute precision. The final result indicated that a sample size of N=1950 was necessary, achieved through nonprobability consecutive sampling. The sample size was divided into two groups Urgent CD was named Group A with a sample size of 550 and elective CD was named Group B with a sample size of 1400.

Results

The average age was significantly lower in the urgent cesarean group (30±5.3 years) compared to the elective cesarean group (31.4±5.1 years) with a p-value of 0.001. The two groups had no significant difference in body mass index (BMI) (urgent: 27±5.5 compared to elective: 26.8±4.3 kg/m2, p=0.302). The percentage of primiparous was 48.0% in urgent and 46.5% in elective with a p-value of 0.593. Hypertension was more common in the urgent cesarean group (15.2%) than in the elective group (9.8%) with a p-value of 0.002. In comparison, the rates of diabetes were similar (7.1%) in urgent cesarean as compared to elective group 5.5%. A higher percentage of women had a previous cesarean in the elective group (40.3%) compared to the urgent group (32.4%, p=0.004). The gestational age at delivery was significantly shorter in the urgent cesarean group (37.5±1.8 weeks) than in the elective group (38.7±1.1 weeks, p<0.001). (Table 1)

Table 1 Baseline Characteristics of Women Undergoing Urgent (Emergency) vs Elective Cesarean Deliveries

Characteristics	Urgent Cesarean (n=550)	Elective Cesarean (n=1400)	p-value
Mean Age (years)	30.2±5.3	31.4±5.1	0.001
BMI (kg/m2)	27±4.5	26.8±4.3	0.302
Primiparous (%)	48.0%	46.5%	0.593
Hypertension (%)	15.2%	9.8%	0.002
Diabetes (%)	7.1%	5.5%	0.197
Previous Cesarean (%)	32.4%	40.3%	0.004
Gestational Age (weeks)	37.5±1.8	38.7±1.1	<0.001

Birth characteristics are compared between women who underwent urgent cesarean deliveries (n=550) and those who had elective cesarean deliveries (n-1400). The average birth weight was significantly lower in the urgent cesarean group (3050±550 grams) with a p-value of 0.001. Infants with Apgar scores less than 7 at 5 minutes were more common in the urgent group (12.5%) compared to the elective group (3.2%) with a p-value less than 0.001. NICU admissions were higher among urgent cesarean deliveries 1.0% compared to elective ones (5.4%) with a p-value of less than 0.001. Regional anesthesia was predominantly used in elective cases (84.2%) compared to urgent cases (54.9%) with a p-value of less than 0.001. (Table 2)

Table 2 Birth Characteristics of Women undergoing Urgent (Emergency) vs Elective Cesarean Delivery

Characteristics	Urgent Cesarean (n=550)	Elective Cesarean (n=1400)	p-value
Mean Birth Weight (grams)	3050± 600	3200±550	<0.001
Apgar Score < 7 at 5 minutes (%)	12.5%	3.2%	<0.001
NICU admissions (%)	18.0%	5.4%	<0.001
Mode of Anesthesia (%)			
• General Anesthesia	45.1%	15.8%	<0.001
• Regional Anesthesia	54.9%	84.2%	<0.001

The urgent cesarean group had a significantly higher neonatal mortality rate of 2.0% compared to the elective group of 0.7% with a p-value of 0.042. Postpartum hemorrhage was more common in urgent cesarean cases (10.3%) than in elective cases (4.8%), with a highly significant p-value of less than 0.001. Maternal ICU admissions were also more frequent following urgent cesareans 5.5% compared to 1.9% in elective cases with a highly significant p-value of less than 0.001. Moreover, patients

undergoing urgent cesareans had a longer hospital stay (5.1±2.4 days) compared to those with elective procedures (3.4±1.2 days), with a p-value of less than 0.001 (Table 3)

Table 3 Neonatal and Postpartum Maternal Outcome following Urgent (Emergency) vs Elective Cesarean Delivery

Outcome	Urgent cesarean (n=550)	Elective Cesarean (n=1400)	p-value
Neonatal Mortality (%)	2.0%	0.7%	0.042
Postpartum Hemorrhage (%)	10.3%	4.8%	<0.001
Maternal ICU Admission (%)	5.5%	1.9%	<0.001
Length of Hospital Stay (days)	5.1±2.4	3.4±1.2	<0.001

The results revealed that maternal age has a significant impact on the likelihood of early cesarean deliveries (AOR 1.05, 95%, 1.02 to 1.08) with a p-value of 0.003. Factors that contributed to elective cesarean deliveries performed before their planned time are gestational hypertension and a history of previous cesarean sections. Gestational hypertension and a history of previous cesarean sections are both associated with increased odds of early cesarean deliveries (AOR 1.87, 95% Confidence interval (CI) 1.24 to 2.81, with a p-value of 0.002) and (AOR 1.34, 95% Confidence interval of 95%1.01 to 1.78, with a p-value of 0.043). Greater gestational age appears to decrease the odds of early cesarean deliveries (AOR, 95% Confidence Interval, 0.72 to 0.87 with a highly significant p-value of less than 0.001. Fetal distress appeared as the strongest predictor, significantly raising the odds of early cesarean deliveries (AOR 3.12, 95% CI 95%, 2.15 to 4.53, with a highly significant p-value less than 0.001. (Table 4).

Table 4 Multivariate Analysis of Factors Associated with Elective Cesarean Deliveries Conducted Prior to the Scheduled Date

Factors	Adjusted Odds Ratio (95% CI)	p-value
Maternal Age	1.05 (1.02-1.08)	0.003
Gestational Hypertension	1.87 (1.24-2.81)	0.002
Previous Cesarean	1.34 (1.01-1.78)	0.043
Gestational Age	0.79 (0.72-0.87)	<0.001
Fetal Distress	3.12 (2.15-4.53)	<0.001

Discussion

In this study, the aim was to identify the characteristics of females for whom elective cesarean delivery was planned but then ended up having an urgent CD before the planned date. The average age of women in the urgent cesarean group was 30±5.3 years, which was significantly lower compared to the elective cesarean group, where the average age was 31.4±5.1 years with a p-value of 0.001. There was no significant difference in BMI among the two groups (urgent: 27±5.5, elective: 26.8±4.3 kg/m2, p=0.302).as compared to a study conducted by S. Daneli-Gruber et al (16), there was a significant difference in maternal age in our study, with mothers undergoing elective Cesarean delivery being slightly older, whereas no significant difference in parity was observed.

The ideal timing for a scheduled cesarean birth depends on weighing the risks of early delivery against the necessity for an instant cesarean section (15) Avoiding risks for newborns unnecessary early births before 39 weeks is commonly accepted because of the potential (17,18). Nevertheless, research indicates that women who planned elective cesarean births at 39 weeks have a higher chance of needing an emergency delivery compared to those planned at 38 weeks of pregnancy (19,20).

In general, the rates of conversion from scheduled cesarean deliveries (CDs) vary from thirteen percent to sixteen percent for cesarean deliveries (CDs) at 38 weeks age of gestation and increase to twenty-three percent to fifty-one percent for cesarean deliveries at thirty-nine weeks of gestation according to information found in the literature (19). Our study highlighted that the gestational age at delivery was notably lower in the urgent cesarean group (37.5±1.8 weeks) compared to the elective group (38.7±1.1 weeks, p<0.001)

Women in the urgent CD group were found to have a higher prevalence of chronic hypertension and hypertensive disorders during pregnancy. Previous studies do not indicate that hypertension alone is a risk factor for cesarean delivery in women without indications for cesarean delivery. Preeclampsia is a risk factor for chronic hypertension (21,22). The study revealed that both gestational hypertension and a history of previous cesarean deliveries are associated with increased chances of early cesarean sections. The odds ratios for these factors were 1.87 (95% CI 1.24 to 2.81, p=0.002) and 1.34 (95% CI 1.01 to 1.78, p=0.043), respectively.

The study had limitations due to its retrospective design and the selection bias caused by our strategy of scheduling cesarean deliveries earlier in more complicated surgical cases, which reduced the likelihood of spontaneous labor occurring for these women. The classification of indication for cesarean delivery was open to debate as certain reasons encompassed a variety of groups within them. Furthermore, there was a lack of data regarding the long-term outcomes of the infants.

Conclusion

Risk factors for urgent cesarean section surgery are gestational hypertension and a history of previous C-sections. Gestational hypertension and a history of previous cesarean surgery were associated with early cesarean sections. Fetal distress appeared as the strongest predictor, significantly raising the odds of early cesarean deliveries.

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