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PERINATAL OUTCOMES AND EARLY POSTOPERATIVE RESULTS IN NULLIPAROUS WOMEN UNDERGOING EMERGENCY VS PLANNED CESAREAN SECTION: A COMPARATIVE STUDY

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ANNOTATION

Background. Emergency cesarean section (CS) in nulliparous women is more often driven by acute obstetric complications and may be associated with poorer perinatal outcomes and prolonged postoperative hospitalization.
Purpose of the study. To evaluate perinatal outcomes and early postoperative results in nulliparous women undergoing emergency CS compared with planned CS.
Material and methods. A retrospective analysis of 350 delivery records (2022-2024) was conducted in a tertiary-level hospital. The emergency CS group included 245 women and the planned CS group included 105 women. The mean age in the total sample was 26.1 ± 0.3 years (24.7 ± 0.4 years in the emergency CS group and 29.5 ± 0.5 years in the planned CS group). Categorical variables were compared using Pearson's chi-square test ($\chi 2$). Differences were considered statistically significant at $p < 0.05$.
Research results. In the emergency CS group, hypertensive pregnancy complications (severe and moderate preeclampsia) and amniotic fluid volume disorders (polyhydramnios and oligohydramnios) were more frequent ($p < 0.05$). Complications observed only in the emergency CS group included partial placental abruption and prelabor rupture of membranes. The leading indications for emergency CS were obstructed labor (19.5%), fetal distress (16.3%), failed labor stimulation (7.3%), placental abruption (6.1%), and combined factors. Perinatal outcomes after emergency CS were characterized by a higher rate of moderate asphyxia (24.0% vs 5.7%), severe asphyxia occurring only in the emergency CS group (1.6%), a higher proportion of newborns with Apgar scores 4-6 at 1 minute (24.0% vs 5.7%; $p < 0.001$), and a tendency toward higher fetal growth restriction (6.1% vs 4.7%; $p < 0.05$). Postoperative complications (endometritis, metroendometritis, seroma, uterine hypotonia) and pathological blood loss were predominantly noted after emergency CS. Hospital stay of 11-16 days was more common in the emergency CS group (11.0% vs 3.8%; $p < 0.001$).
Conclusions. Emergency CS in nulliparous women is associated with a more severe gestational and intrapartum profile, less favorable early perinatal indicators, and longer postoperative hospitalization.

KEYWORDS. *Emergency Cesarean Section, Planned Cesarean Section, Nulliparous Women, Perinatal Outcomes, Apgar Score, Asphyxia, Preeclampsia, Hospitalization.*

TOPICALITY

Against the backdrop of a sustained global increase in cesarean section (CS) rates, differentiating outcomes by the type of operation - emergency versus planned - has become clinically crucial [8,9]. This distinction is essential because emergency CS is typically a forced intervention that reflects complicated pregnancy and/or labor (hypertensive disorders, placental complications, labor abnormalities, fetal distress) and may therefore worsen prognosis for both the mother and the newborn [1,4]. Under limited time for preoperative preparation, emergency surgery is often performed in the setting of evolving fetomaternal decompensation, which is associated with a higher likelihood of hemorrhagic and infectious-inflammatory maternal complications, an increased risk of neonatal hypoxic conditions, and prolonged postoperative hospitalization [4]. Moreover, an increase in CS performed without strict indications has been regarded as a factor that may raise the frequency of adverse obstetric and perinatal outcomes, emphasizing the importance of a clinically justified delivery strategy [10].

Within the WHO framework and the use of the Robson Ten-Group Classification System (TGCS), it is important not only to quantify the contribution of specific obstetric groups to overall CS rates, but also to analyze perinatal morbidity and complication levels within the groups that contribute most substantially to surgical activity in maternity hospitals [3]. This approach enables a shift from merely counting operations to assessing the quality of outcomes and identifying modifiable risk factors, particularly in key cohorts,

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including nulliparous women, for whom the first CS often shapes subsequent obstetric trajectories and increases the likelihood of repeat interventions in the future [1].

PURPOSE OF THE STUDY

To evaluate perinatal outcomes and early postoperative results in nulliparous women undergoing emergency cesarean section compared with planned cesarean section.

RESEARCH MATERIALS AND METHODS

Study design. Retrospective cohort study with two-group comparison.
Setting. Tajik Research Institute of Obstetrics, Gynecology and Perinatology (tertiary-level hospital), 2022-2024.
Study population. A total of 350 nulliparous women delivered by cesarean section were included.
Groups: (1) emergency CS (n = 245); (2) planned CS (n = 105). The mean age in the total sample was 26.1 ± 0.3 years (24.7 ± 0.4 vs 29.5 ± 0.5 years, respectively).
Perinatal indicators: fetal growth restriction (FGR), asphyxia, Apgar score, and neonatal birth weight.
Maternal indicators: pregnancy complications, indications for surgery, intraoperative blood loss, postoperative complications, and length of hospital stay.
Statistical analysis. Categorical variables were compared using Pearson's chi-square test ($\chi 2$). Statistical significance was set at $p < 0.05$.

RESEARCH RESULTS

Pregnancy complications. The distribution of gestational complications differed between groups and reflected a more adverse clinical profile among women who required emergency CS. As shown in Table 1, hypertensive disorders (severe and moderate preeclampsia) and amniotic fluid volume disorders were significantly more frequent in the emergency CS group. Complications occurring only in the emergency CS group indicate acute obstetric events requiring urgent operative delivery.

Table 1
Pregnancy complications in nulliparous women by type of cesarean section

Pregnancy Complication	Emergency CS (n=245), n (% ± m)	Planned CS (n=105), n (% ± m)	p-value
Severe Preeclampsia	27 (11.0 ± 2.0)	6 (5.7 ± 2.3)	< 0.05
Moderate Preeclampsia	26 (10.6 ± 2.0)	7 (6.6 ± 2.4)	< 0.05
Polyhydramnios	17 (6.9 ± 1.6)	4 (3.8 ± 1.9)	< 0.05
Oligohydramnios	15 (6.1 ± 1.5)	3 (2.8 ± 1.6)	< 0.05
Partial Placental Abruption	10 (4.0)	0 (0)	-
Prelabor Rupture Of Membranes	45 (18.3)	0 (0)	-

Note: Group comparisons were performed using Pearson's chi-square test ($\chi 2$). Statistical significance was set at $p < 0.05$.

Severe preeclampsia was almost twice as frequent after emergency CS compared with planned CS (11.0 ± 2.0% vs 5.7 ± 2.3%; $p < 0.05$), and a similar pattern was observed for moderate preeclampsia (10.6 ± 2.0% vs 6.6 ± 2.4%; $p < 0.05$). Amniotic fluid volume disorders were also more common in the emergency CS group (polyhydramnios 6.9 ± 1.6% vs 3.8 ± 1.9%; oligohydramnios 6.1 ± 1.5% vs 2.8 ± 1.6%; $p < 0.05$). Clinically important acute events - partial placental abruption (4.0%) and prelabor rupture of membranes (18.3%) - were observed only in the emergency CS group, supporting the major role of acute obstetric complications in urgent surgery and their potential contribution to poorer perinatal outcomes and prolonged recovery.

Indications for Emergency CS. To clarify the determinants of urgent surgery in nulliparous women, the spectrum of indications for emergency CS was analyzed. Table 2 shows that intrapartum complications predominated, requiring rapid delivery to prevent hypoxic and traumatic consequences for the fetus and to reduce maternal risks.

Table 2.
Structure of indications for emergency cesarean section in nulliparous women

Indication for emergency CS	Proportion, %
Obstructed labor	19.5
Fetal distress	16.3
Failed labor stimulation	7.3
Partial placental abruption	6.1
Combined factors (various combinations)	other

Obstructed labor (19.5%) and fetal distress (16.3%) were the most common indications, reflecting the predominance of mechanical and hypoxic pathways leading to urgent intervention. Failed labor stimulation (7.3%) suggests a substantial burden of uterine contractility disorders and limited effectiveness of pharmacological augmentation in part of the cases. Placental abruption (6.1%)

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represents a high-risk condition requiring immediate delivery because of the threat of acute fetal hypoxia and maternal hemorrhagic complications. The share of combined factors highlights the multifactorial nature of urgent scenarios, in which emergency decisions are driven by several unfavorable circumstances rather than a single cause.

Perinatal Outcomes. Because all newborns were term, differences in neonatal condition at birth predominantly reflect complicated pregnancy and intrapartum factors rather than prematurity. To assess early neonatal adaptation, fetal growth restriction, asphyxia, and Apgar score distribution at 1 minute were compared between groups (Table 3).

Table 3.
Perinatal outcomes in nulliparous women after emergency vs planned cesarean section

Outcome	Emergency CS (n=245), n (% ± m)	Planned CS (n=105), n (% ± m)	p-value
Fetal Growth Restriction (FGR)	15 (6.1 ± 4.2)	5 (4.7 ± 4.1)	< 0.05
Moderate Asphyxia	60 (24.0)	6 (5.7)	< 0.05
Severe Asphyxia	4 (1.6)	0 (0)	-
Apgar ≥7/8 at 1 Minute	181 (73.8 ± 2.8)	99 (94.2 ± 2.3)	< 0.05
Apgar 4-6 at 1 Minute	60 (24.0 ± 2.7)	6 (5.7 ± 2.3)	< 0.001
Apgar ≤4 at 1 Minute	4 (1.6 ± 0.8)	0 (0)	-

Note: *Categorical outcomes were compared using Pearson's chi-square test ($\chi 2$). Statistical significance was set at $p < 0.05$.*

Early Postoperative Results. To evaluate surgical outcomes comprehensively, maternal early postoperative indicators were analyzed, focusing on pathological blood loss and prolonged hospitalization (11-16 days) as integrated markers of a complicated postoperative course and increased need for in-hospital treatment and monitoring (Table 4).

Table 4. Early postoperative outcomes and length of hospital stay by type of cesarean section

Indicator	Emergency CS (n=245), n (%)	Planned CS (n=105), n (%)	p-value
Pathological Blood Loss	12 (4.9)	0 (0)	-
Hospital stay 11-16 days	27 (11.0)	4 (3.8)	< 0.001

Note: Categorical variables were compared using Pearson's chi-square test ($\chi 2$); $p < 0.05$ was considered statistically significant.

DISCUSSION

The findings indicate that emergency CS in nulliparous women is primarily performed in the context of a more severe gestational and intrapartum profile, which is reflected in neonatal status at birth and in maternal early postoperative recovery. Compared with planned CS, emergency intervention is often carried out under time pressure due to escalating pregnancy or labor complications, where the main clinical objective is prevention of critical maternal and perinatal outcomes.

Hypertensive pregnancy disorders were significantly more frequent in the emergency CS group. Preeclampsia is associated with generalized endothelial dysfunction, vasospasm, and impaired uteroplacental perfusion, increasing the likelihood of chronic intrauterine hypoxia and placental insufficiency. Clinically, this translates into a higher risk of fetal distress, reduced fetal tolerance to labor stress, and a greater probability of urgent operative delivery. The higher FGR rate further supports a less favorable placental profile in women requiring emergency CS.

Amniotic fluid volume disorders were also more common in the emergency CS group and may be interpreted as markers of complicated pregnancy and dysfunction of the mother-placenta-fetus unit. Oligohydramnios is often linked to chronic placental insufficiency and hypoxia risk, while polyhydramnios can be associated with placental exchange disturbances and higher rates of labor dysfunction. These factors collectively increase the likelihood of unfavorable intrapartum adaptation and the need for urgent surgery.

Acute complications occurring only in the emergency CS group - partial placental abruption and prelabor rupture of membranes - are typical triggers for urgent intervention because of the risks of acute fetal hypoxia, maternal hemorrhage, infection, and rapid deterioration. Their exclusive presence in the emergency CS group supports the central role of acute obstetric events in generating urgent operations.

The predominance of intrapartum indications (obstructed labor, fetal distress, failed stimulation) highlights the dynamic nature of complications in labor and the limited time window for decision-making. Emergency CS is therefore commonly the end point of rapidly evolving scenarios requiring immediate escalation to avoid severe maternal and neonatal consequences.

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Perinatal outcomes after emergency CS were characterized by higher asphyxia rates and lower Apgar scores, likely reflecting both chronic placental dysfunction and acute intrapartum hypoxic events. Since all newborns were term, these differences are attributable to the pathological background of pregnancy and labor rather than gestational immaturity.

Maternal recovery after emergency CS was less favorable, as indicated by pathological blood loss and a higher proportion of prolonged hospitalization. This underscores the need to strengthen prevention and early detection of gestational complications, improve antenatal monitoring for placental insufficiency and FGR, ensure timely referral to appropriate-level facilities, and optimize intrapartum management algorithms (early detection of fetal distress, assessment of labor progress, and rational use of stimulation).

CONCLUSION

1. Emergency CS in nulliparous women is typically performed in the setting of a more severe gestational and intrapartum profile, evidenced by higher rates of hypertensive pregnancy complications and amniotic fluid volume disorders ($p < 0.05$).
2. Acute complications requiring immediate operative delivery (partial placental abruption and prelabor rupture of membranes) were observed only in the emergency CS group, emphasizing the key role of acute obstetric events in urgent surgery.
3. Intrapartum indications predominated among reasons for emergency CS: obstructed labor (19.5%), fetal distress (16.3%), failed labor stimulation (7.3%), and placental abruption (6.1%).
4. Emergency CS was associated with poorer early neonatal adaptation: higher rates of moderate asphyxia, severe asphyxia occurring only in the emergency CS group, a lower proportion of Apgar ≥7/8, and a higher proportion of Apgar 4-6 ($p < 0.001$).
5. Early postoperative outcomes were less favorable after emergency CS, including pathological blood loss (4.9% only in the emergency CS group) and more frequent prolonged hospitalization (11-16 days: 11.0% vs 3.8%; $p < 0.001$).
6. The results support strengthening antenatal prevention of gestational complications, timely referral of high-risk pregnancies, and optimization of labor management algorithms to reduce emergency CS rates and improve maternal and perinatal outcomes.

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