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Fetomaternal Outcome of Second Stage Cesarean Section in GMC/DHQ MTI Dera Ismail Khan

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ABSTRACT

Background: Second stage caesarean section is associated with difficult delivery and increased risk of adverse maternal and neonatal outcomes due to impacted fetal head and prolonged labour. **Objective:** To determine the fetomaternal outcome of second stage caesarean section. **Study Design:** Cross sectional study. **Duration and Place of Study:** This study was conducted from 02 November 2024 to 02 April 2025 in the Department of Obstetrics and Gynaecology, GMC/DHQ MTI Dera Ismail Khan. **Methodology**: A total of 138 women aged 18–45 years with singleton term pregnancy undergoing second stage caesarean section were included by non-probability purposive sampling. Fetomaternal outcomes including postpartum haemorrhage, neonatal intensive care unit admission, meconium aspiration, birth asphyxia, sepsis and prolonged labour were assessed. Data were analysed using Statistical Package for Social Sciences version 25. **Results:** Mean age was 28.40 ± 6.62 years and mean gestational age was 38.57 ± 1.73 weeks. Postpartum haemorrhage was observed in 39 (28.3%) patients. Neonatal intensive care unit admission was required in 38 (27.5%) neonates. Meconium aspiration was noted in 29 (21.0%) cases. Sepsis occurred in 16 (11.6%) women and birth asphyxia in 15 (10.9%) neonates. Prolonged labour was seen in 12 (8.7%) patients. **Conclusion:** Second stage caesarean section is associated with high fetomaternal morbidity, particularly postpartum haemorrhage and neonatal intensive care unit admission.

INTRODUCTION

Second-stage cesarean delivery is a surgery that involves delivering an infant when the cervix is completely dilated and the baby's head is usually well-seated inside the pelvis, making it difficult compared to the first-stage Cesarean delivery.[1] The second-stage delivery often features impacted fetal heads that may cause problems in extraction and can result in harm to both the mother and fetus.[2] Second-stage Cesarean is recommended in cases of obstructed delivery, lack of descent, and fetal distress. In addition, it demands more advanced surgical skills and experience because it entails working in a confined area and under limited access; it may also entail extending the uterine incision, damage to other structures, and profuse bleeding during surgery.[3]

Fetomaternal consequences in relation to second-stage cesarean delivery are more detrimental compared to those encountered with procedures performed in earlier stages.[4] One of the problems faced by newborns is their NICU admission, which is due to their compromised state upon delivery.[5] Meconium aspiration is common, as it is caused by fetal distress and a prolonged period of labor that promotes meconium passage while inside the womb.[6] Birth asphyxia is another consequence that results from `delayed delivery and poor oxygenation within the second stage of delivery, which may need resuscitation and close monitoring in the postpartum period.[7] Postpartum bleeding is also more common for mothers who had cesarean delivery in the second stage due to uterine atony and uterine extension during delivery.[8]

Additionally, problems like sepsis among others are common in mothers due to prolonged labor and frequent vaginal examinations before the surgery process begins.[9] There is a high likelihood of infections being acquired because of this, especially since it increases the risk of infection. Prolonged labor causes exhaustion on the part of the mother, dehydration, and sometimes even injuries such as those to the bladder.[10]

The rationale behind conducting the study comes as a result of the relationship between cesarean section delivery in the second stage and an increase in the number of complications both for the mother and baby. Moreover, there is insufficient data in the locality with respect to fetomaternal outcome following cesarean delivery in the second stage of delivery. However, failure to make a quick

decision and poor management skills can worsen the situation even further; thus, it is crucial to evaluate the prevalence of these complications such as admission to NICU, birth asphyxia, post-partum hemorrhage, and sepsis. The objective of this study is to determine the fetomaternal outcome of second stage caesarean section.

METHODOLOGY

This cross sectional study was carried out at the Department of Obstetrics and Gynaecology, GMC/DHQ MTI Dera Ismail Khan, from 02 November 2024 to 02 April 2025. Ethical permission was taken from the hospital ethical committee and research unit of CPSP before start of data collection. The sample size was calculated by WHO sample size calculator by taking expected frequency of prolonged labour 7.1%,[11] margin of error 4.3% and confidence level 95%, giving total sample size 138. Patients were enrolled by non-probability purposive sampling technique.

Inclusion Criteria

Women aged 18 to 45 years, having single alive intrauterine pregnancy confirmed on ultrasound, in second stage of labour and undergoing Cesarean sections, gestational age >36 weeks on LMP/scan, and both primi and multi gravida were included.

Exclusion Criteria

Patients having prior medical disorders, complicated pregnancies such as Gestational Diabetes Mellitus, Pregnancy Induced Hypertension or Eclampsia, pregnancies with congenital anomalies or intrauterine growth restriction (fetal weight and abdominal circumference <10th percentile on ultrasonography), fetal malpresentation on scan and placenta previa on ultrasound were excluded.

After taking informed written consent, demographic data were recorded including age, BMI, education status, employment status, residence area and socio economic status. Detailed history was taken and clinical examination was done including obstetric assessment and confirmation of labour stage. All patients underwent Cesarean section in second stage of labour under supervision of consultant having ≥5 years post fellowship experience and were followed till delivery and immediate post-operative period for assessment of fetomaternal outcomes. Data were collected by the trainee herself on structured proforma.

Second stage cesarean sections were considered when surgical delivery was performed after full cervical dilatation of 10 cm on vaginal examination. Fetomaternal outcomes were assessed after delivery and during hospital stay. Postpartum hemorrhage was taken when blood loss was >1000 ml after cesarean section, measured by weighing soaked promed and blutex pads after subtracting dry weight, and clots with 1 gm equal to 1 ml blood. Sepsis was labelled when patient had symptoms like chills, nausea and vomiting along with any ≥2 of fever ≥38°C, tachycardia >90 beats per minute, tachypnea >20 breaths per minute, leukocytosis >12000/µL or leukopenia <4000/µL. Prolonged labor was categorized as labor taking over 2 hours in nulliparous women and over 1 hour in multiparous women. The admission of newborn infants to the NICU was decided in cases where the newborn needed to be moved to the NICU for observation or critical care. Meconium aspiration syndrome was suspected if the neonate had problems such as respiratory distress, cyanosis, grunting, or nasal flaring associated with evidence of atelectasis, hyperinflation, or infiltrates on the chest x-ray. Birth asphyxia was recognized if there were findings like poor muscle tone, lethargy, hypotonia, cyanosis, and respiratory distress associated with an Apgar score of ≤3 after 1 minute and ≤5 after 5 minutes.

Data were analysed using Statistical Package for Social Sciences (SPSS version 25.0, IBM Corporation, USA). Quantitative variables such as age, gestational age and BMI were expressed as mean ± standard deviation after checking normality by Shapiro Wilk test. Categorical variables like fetomaternal outcomes (NICU admission, meconium aspiration, birth asphyxia, post-partum hemorrhage, sepsis, and prolonged labour), education status, employment status, residence area, and socio economic status were presented as frequencies and percentages.

RESULTS

The study enrolled 138 patients with a mean age of 28.40 ± 6.62 years, mean BMI of 28.56 ± 2.45 kg/m^2, and mean gestational age of 38.57 ± 1.73 weeks. Majority of the patients were from low socioeconomic background 67 (48.6%), followed by middle 50 (36.2%) and high socioeconomic class 21 (15.2%). Most of the women were unemployed 105 (76.1%) and uneducated 85 (61.6%). More than half of the patients were from rural areas 81 (58.7%) as compared to urban 57 (41.3%) (Table 1).

Table 1

Patient Demographics

Demographics		Mean ± SD / n (%)
Age (years)		28.40 ± 6.62
BMI (kg/m^2)		28.56 ± 2.45
Gestational Age (weeks)		38.57 ± 1.73
Socioeconomic Status	Low n (%)	67 (48.6%)
	Middle n (%)	50 (36.2%)
	High n (%)	21 (15.2%)
Employment Status	Employed n (%)	33 (23.9%)
	Unemployed n (%)	105 (76.1%)
Education Status	Educated n (%)	53 (38.4%)
	Uneducated n (%)	85 (61.6%)
Residence	Rural n (%)	81 (58.7%)
	Urban n (%)	57 (41.3%)

Regarding the fetomaternal outcomes, postpartum haemorrhage was observed in 39 (28.3%) patients whilst NICU admission were required in 38 (27.5%) neonates. Meconium aspiration were noted in 29 (21.0%) cases. Sepsis were developed in 16 (11.6%) women and birth asphyxia were seen in 15 (10.9%) neonates. Prolonged labour was the least frequent complication, observed in only 12 (8.7%) patients (Table 2).

Table 2

Fetomaternal Outcomes of Second Stage Cesarean Section

Outcome Variables		Frequency	%age
NICU Admission	Yes	38	27.50%
	No	100	72.50%
	Total	138	100%
Meconium Aspiration	Yes	29	21.00%
	No	109	79.00%

	Total	138	100%
Birth Asphyxia	Yes	15	10.90%
	No	123	89.10%
	Total	138	100%
Postpartum Hemorrhage	Yes	39	28.30%
	No	99	71.70%
	Total	138	100%
Sepsis	Yes	16	11.60%
	No	122	88.40%
	Total	138	100%
Prolonged Labour	Yes	12	8.70%
	No	126	91.30%
	Total	138	100%

DISCUSSION

The findings of this study were showing that both maternal and neonatal complications were considerably high in this group of patients. Postpartum haemorrhage were the most common maternal complication, observed in 39 (28.3%) patients. This can be explained by the fact that in second stage, the lower uterine segment becomes thin and poorly contractile due to prolonged stretching, which leads to uterine atony and excessive blood loss after delivery. Thirty-eight out of 138 babies (27.5%) needed NICU admission due to poor newborn health status at birth. Delayed delivery of the baby causes constant compression of the fetal head and umbilical cord, leading to fetal hypoxemia and acidosis requiring intensive care of the baby after delivery. The study found meconium aspiration in 29 cases (21.0%). When the fetus is subjected to fetal distress due to prolonged delivery of the baby, it causes vagal stimulation, which facilitates the passage of meconium in utero; meconium aspiration results in severe respiratory problems in the baby. The occurrence of sepsis in 16 women (11.6%) is another major complication of prolonged labor. Infection in the uterus is caused by a prolonged period of ruptured membranes and frequent vaginal exams. Fifteen babies experienced birth asphyxia (10.9%). The brain tissue receives reduced blood supply when the fetal head is under constant pressure during the prolonged delivery process.

Postpartum haemorrhage were observed in 39 (28.3%) patients in the present study, which were comparable to findings of Moin *et al.* [12] who reported atonic postpartum haemorrhage in 32% cases and Das *et al.* [13] who found even higher rate of 72.4%. The higher rate in Das *et al.* [13] study can be attributed to higher proportion of cephalopelvic disproportion cases leading to more impacted foetal heads and difficult uterine extraction, causing greater uterine trauma and atony. The relatively similar rate in present study and Moin *et al.* [12] suggests that prolonged second stage universally compromises uterine contractility regardless of setting.

NICU admission were required in 38 (27.5%) neonates in present study, which were closely comparable to Khanam *et al.* [14] who reported 24% NICU admissions and Shivadarshan *et al.* [15] who found approximately one-third neonates required NICU care. However, Das *et al.* [13] reported considerably higher NICU admission rate of 63.8%, which may be because their cohort had significantly worse neonatal condition at birth with APGAR less than 5 in 56.9% cases, suggesting more advanced foetal compromise before operative delivery was undertaken.

Meconium aspiration were found in 29 (21.0%) cases in present study, which were in agreement with Dahiya *et al.* [16] who reported meconium aspiration in 14.1% and Dugar *et al.* [17] who found meconium aspiration syndrome as the leading cause of NICU admissions in 48.7% of admitted neonates. The variation in rates across studies can be explained by differences in threshold for diagnosis and varying duration of second stage before caesarean section was performed.

Sepsis were developed in 16 (11.6%) women in present study, which were somewhat comparable to postpartum febrile illness reported by Yadav *et al.* [18] in 30.7% and Fatima *et al.* [19] in 29.41% cases using push method. The lower sepsis rate in present study as compared to these studies may be due to differences in definition used, as febrile illness and clinical sepsis are not entirely same condition. Nevertheless, prolonged rupture of membranes and repeated vaginal examinations during second stage remains the common underlying mechanism across all studies.

Birth asphyxia were seen in 15 (10.9%) neonates, which were comparable to Dahiya *et al.* [16] reporting birth asphyxia in 16% and Moin *et al.* [12] finding hypoxic-ischaemic encephalopathy in 32% of NICU admitted neonates. The difference can be explained by the fact that Moin *et al.* [12] reported asphyxia only amongst admitted neonates rather than total cohort, making direct comparison difficult. Overall, the pattern of birth asphyxia across studies consistently reflects the detrimental effect of prolonged foetal head compression during impacted second stage on neonatal cerebral perfusion.

This current study is a one-center study. Therefore, the generalizability of the results from this study cannot be applied beyond this center to other populations. The number of participants in this study was small with only 138 participants, which can affect its conclusion. This study was an observational study and did not use a control group, thus making it difficult to draw a causal link between second-stage cesarean delivery and the results of the study. Information on certain confounders that could have affected fetomaternal outcome was missing from this study, such as the length of second-stage labor, head engagement, and experience of surgeons.

CONCLUSION

According to the present study, it was found that second stage of labor delivery is linked with severe morbidity, which includes postpartum hemorrhage, admission to newborn intensive care unit, meconium aspiration, sepsis, and birth asphyxia. This increased incidence is due to negative impacts of prolonged second stage of labor on both maternal and fetal well-being.

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