



ASSESSMENT OF FETOMATERNAL OUTCOMES FOLLOWING PRIMARY CAESAREAN SECTION IN MULTIGRAVIDA AT A TERTIARY CARE CENTRE

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ABSTRACT

Background: Primary caesarean section in multigravida women with previous vaginal deliveries presents a significant obstetric challenge. Despite previous uneventful vaginal deliveries, these women may develop complications necessitating operative intervention. The study aimed to evaluate the fetomaternal outcomes in primary caesarean section in multigravida women.

Methods: A prospective, observational study was carried out in the Department of Obstetrics and Gynecology at a tertiary care hospital from July 2024 to December 2025. Multigravida women with > 28 weeks of gestation, having a previous vaginal delivery of a viable neonate and participated willingly were included in the study. All primigravida women, gestational age < 28 weeks, pregnant women with previous abortion, ectopic pregnancy, and previous uterine scar excluded from the study. Demographic details, antenatal profile, obstetric indications, intraoperative findings, postoperative maternal complications, and neonatal outcomes were reordere

Results: A total of 77 women with mean age of 28.97±4.52 years were enrolled in the study, with majority [33 (48.85%)] aged 26-30 years. Most patients were booked [53 (68.83%)], urban residents [47 (61.04%)] and belonged to lower middle socio-economic class [30 (38.96%)]. Emergency caesarean sections accounted for [54 (70.13%)] of procedures. Common indications for caesarean section included breech presentation (11.69%), meconium-stained liquor (10.39%), failed induction of labour (9.09%), oligohydramnios (9.09%), previous two LSCS (9.09%). Intraoperative complications occurred in 5.19% (atonic PPH 3.9%), and postoperative morbidity in 11.69% (secondary PPH 3.9%). Neonatal morbidity was 12.99%, with respiratory distress syndrome (5.19%) being the most common. Perinatal morbidity was 3.66% (3/82 neonates).

Conclusion: Primary caesarean section in multigravida women is associated with significant maternal and neonatal morbidity. Regular antenatal surveillance, timely referral, vigilant intrapartum monitoring, and prompt surgical intervention when required are important for achieving favourable fetomaternal outcomes.

KEYWORDS: Primary Caesarean Section, Multigravida, Vaginal Delivery, Fetomaternal Outcomes, Maternal morbidity.

Introduction

Modern obstetrics is the clinical practice concerned with the health and well-being of both mother and foetus. Cesarean section defines as the delivery of the fetus, membrane, and placenta through abdominal and uterine incisions after fetal viability[1]. Primary caesarean section in a multiparous woman refers to the first caesarean delivery performed in a woman who has previously delivered one or more viable infants vaginally[2].

Traditionally, women with prior vaginal deliveries were considered at low risk for obstetric complications. However, this perception leads to complacency among both the patients and healthcare providers, resulting in neglect of routine antenatal checkups. Multiparity is often associated with factors such as poverty, illiteracy, lack of awareness, inadequate knowledge regarding available antenatal care and family planning services, early marriage, poor socioeconomic status, a prevailing preference for male offspring, and high perinatal mortality[3].

Over the past decades, the rate of caesarean section has risen significantly worldwide. The World Health Organization recommends a caesarean section rate of 10-15%, yet many countries, including India, have rates exceeding these recommendations[4]. The National Family Health Survey-5 reported a caesarean section rate of 21.5% in India[5]. This rising prevalence is attributed to improved surgical techniques, advanced fetal monitoring, better anesthesia, blood transfusion facilities, enhanced neonatal care, delayed childbearing, multiple gestations, maternal request, and defensive medical practice[6-8].

Among multigravida women, antepartum hemorrhage (APH) is the most common indication due to increased risk of abnormal placentation. Cephalopelvic disproportion (CPD) also contributes significantly, with advancing parity potentially causing pelvic changes that reduce the anteroposterior diameter. Studies have shown that fetal factors and placental abnormalities constitute the primary indications for caesarean section in multiparous women[9,10].

According to the report by the American College of Obstetricians and Gynecologists (ACOG), the caesarean delivery significantly increases maternal morbidity and mortality compared to vaginal delivery (35.9 vs 9.2 deaths per 100,000 live births)[11]. Elective caesarean section carries a 2.4-fold higher risk of maternal mortality, along with risks inherent to major abdominal surgery due to anesthetic complications, vascular injury, bladder injury, postoperative fever, reduced fertility, increased miscarriage risk, ectopic pregnancy, placental abruption, and placenta previa[12].

In 1934, Dr. Bethel Solomons's paper entitled "The Dangerous Multipara," he stated, "The purpose of this paper, and the reason for its rather striking title, is to dispel once

and for all the common misconception that a primigravida necessarily implies a difficult labour, while a multipara guarantees an easy one." This statement remains still relevant today, as many unforeseen complications occur in women who previously had normal vaginal deliveries. [13]

Therefore, the study was intended to evaluate the indications of fetomaternal outcomes of primary caesarean section in multigravida women, with aim of improving clinical decision-making and reducing maternal and perinatal morbidity and mortality.

Materials and Methods

Study Design and Setting

A prospective observational study was conducted in the Department of Obstetrics and Gynaecology at the tertiary care hospital, Jaipur, Rajasthan, India. The study was carried out over a period of 18 months from 1st July 2024 to 31st December 2025. The study was performed in accordance with the principles of Declaration of Helsinki and the Institutional Ethics Committee approval was obtained (Ref. No.: NIMSUR/IEC/2024/1013, dated 11/05/2024). Written informed consent was obtained from all the participants.

Study Population

Multigravida women (gravida 2 and above) with > 28 weeks of gestation, having a previous vaginal delivery of a viable neonate and participated willingly were included in the study. All primigravida women, gestational age < 28 weeks, pregnant women with previous abortion, ectopic pregnancy, and previous uterine scar excluded from the study.

Sample Size Calculation

The sample size was calculated using the standard formula for prevalence studies:

$$n = \frac{Z_{1-\alpha/2}^2 \times p \times (1 - p)}{d^2}$$

Where Z = 1.96 (at 95% confidence level), p = estimated prevalence ~0.2%, (derived from previous studies), and d = absolute allowable error of 1%

Therefore, $n = \frac{0.00013.8416 \times 0.002 \times 0.998}{0.0001} = 76.67 \approx 77$

A total of 77 eligible women were enrolled in the study.

Data Collection

A detailed history was obtained including demographic data, present pregnancy details, and past obstetric history. Physical & obstetrical examination were performed. Gestational age was determined by using last menstrual period or earliest ultrasonography. Routine investigations, including complete blood count, fasting blood sugar, ABORH, VDRL, HIV, HBsAg, urine complete microscopy, and ultrasound with fetal colour Doppler study (if indicated) were done. Pelvic assessment and Bishop's score were noted.

Labour was monitored by using a partograph. The decision for caesarean section was based on clinical evaluation of the progress of labour, fetal and maternal condition. The type of anaesthesia was decided by the anesthesiologist. All intraoperative details were noted, and complications were managed promptly. Cases were attended by a paediatrician. Postoperative period was monitored, and complication managed accordingly. Mothers with uneventful postoperative recovery were discharged on 5th postoperative day, and a postnatal visit was scheduled after 6 weeks. Newborns were examined daily, and immunisation was done. At the time of discharge, cases without sterilisation were advised a spacing method and mandatory hospital delivery in the next pregnancy.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using SPSS version 16.0. Continuous variables were expressed as mean $\pm$ standard deviation. Categorical variables were

expressed as percentages and proportions. No hypothetical testing was performed.

Results

Socio-demographic Details & Obstetric Profile

Among 77 participants, majority [33 (48.85%)] aged 26-30 years with the mean age of 28.97 ± 4.52 years. Most patients were booked [53 (68.83%)], urban residents [47 (61.04%)], had secondary level of education [40 (51.95%)] and belonged to lower middle socio-economic class [30 (38.96%)]. Gravida 2 women comprised the majority [56 (72.73%)]. Gestational age of 36-39 weeks 6 days was predominant [54 (70.13%)]. Maternal disorders were present in [15 (19.48%)] of participants, with PIH being most common [8 (10.39%)]. Of the participants, vertex fetal presentation was most common [62 (80.52%)]. Table 1 illustrates socio-demographic characteristics and obstetric profile of the participants.

Table 1: Socio-demographic Characteristics & Obstetric Profile

Variable		Total no of participants [n (%)] = 77
Socio-demographic Details		
Age group (years)	21-25	18 (23.37)
	26-30	33 (48.85)
	31-35	19 (24.67)
	> 36	7 (9.09)
Mean $\pm$ SD		28.97 $\pm$ 4.52 years
Area of Residence	Urban	47 (61.04)
	Rural	30 (38.96)
Education Level	Illiterate	2 (2.6)
	Primary	5 (6.49)
	Secondary	40 (51.95)
	Senior Secondary	28 (36.36)
	Graduation	2 (2.6)
Socioeconomic Class	Upper middle	8 (10.39)
	Lower middle	30 (38.96)
	Upper lower	22 (28.57)
	Lower	17 (22.08)
Obstetric Profile		
Case Booking Status	Booked	53 (68.83)
	Unbooked	24 (31.17)
Referral Status	Referred	12 (15.58)
	Not referred	65 (84.42)
Gravidity	G2	56 (72.73)
	G3	11 (14.29)
	G4	7 (9.09)
	G5	3 (3.90)

Gestational Age	28-31 weeks 6 days	5 (6.49)
	32-35 weeks 6 days	7 (9.09)
	36-39 weeks 6 days	54 (70.13)
	≥ 40 weeks	11 (14.29)
Maternal Disorder	Pregnancy-induced hypertension (PIH)	8 (10.39)
	Anemia	3 (3.90)
	Hypothyroidism	2 (2.6)
	Gestational diabetes mellitus (GDM)	1 (1.3)
	Heart disease	1 (1.3)
Total		15 (19.48)
Fetal Presentation	Vertex	62 (80.52)
	Breech	8 (10.39)
	Transverse lie	2 (2.6)
	Twins (Breech-Breech)	2 (2.6)
	Twins (Vertex-Breech)	2 (2.6)
	Twins (Transverse-Breech)	1 (1.3)

Indications for Caesarean Section

The most common indications for caesarean section were breech presentation [9 (11.69%)], meconium-stained liquor [8 (10.39%)], failed induction of labour [7 (9.09%)], oligohydramnios [7 (9.09%)], previous two LSCS [7 (9.09%)]. Figure 1 illustrates the indication for caesarean section among the participants.

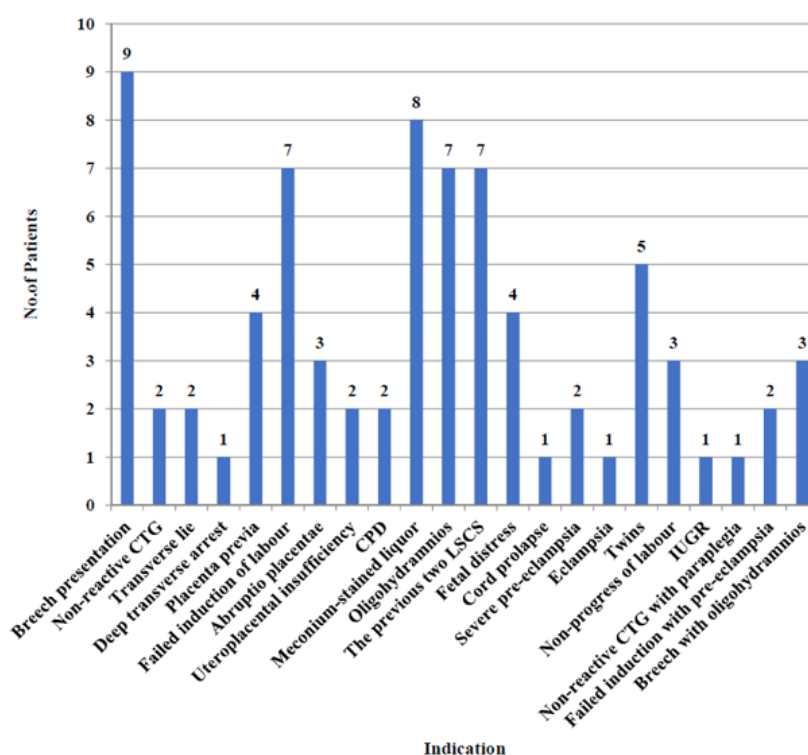


Figure 1: Indications for Caesarean Section

Surgical and Contraceptive Profile

Among the participants, emergency caesarean sections accounted for 54 (70.13%) of procedures. Spinal anesthesia was predominantly used [72 (93.51%)]. The majority [52 (67.53%)] did not use any contraceptive method during caesarean section, shown in Table 2.

Table 2: Perioperative and Contraceptive Profile of Study Participants

Characteristics		Total no [n (%)]
Type of Lower Segment Caesarean Section (LSCS)	Emergency	54 (70.13)
	Elective	23 (29.87)
Type of Anaesthesia	Spinal	72 (93.51)
	General	5 (6.49)
Contraceptive Method	IUCD*	7 (9.09)
	Sterilization	18 (23.38)
	No Contraceptive	52 (67.53)

*IUCD: Intrauterine Contraceptive Device

Intraoperative and Postoperative Complications among the Participants

Intraoperative complications occurred in [4 (5.19%)] of cases, with atonic PPH being most common [3 (3.9%)]. Postoperative morbidity was observed in [9 (11.69%)] of cases, where secondary PPH was most common [3 (3.9%)], followed by febrile morbidity [2 (2.6%)], shown in Table 3.

Table 3: Intraoperative Complications & Postoperative Morbidity

Complications		Total no [n (%)]
Intraoperative Complications	Atonic Postpartum Hemorrhage (PPH)	3 (3.9)
	Extension of uterine incision	1 (1.3)
Total		4 (5.19)
Postoperative Morbidity	Secondary PPH	3 (3.9)
	Febrile morbidity	2 (2.6)
	Wound infection	1 (1.3)
	Urinary tract infection (UTI)	1 (1.3)
	Respiratory tract infection	1 (1.3)
	Muscle hematoma	1 (1.3)
Total		9 (11.69)

Table 4: Distribution of Neonatal Outcomes

Distribution of Characteristics		Total no [n (%)] = 82
APGAR Score: ≥ 7	At 1 minute	68 (82.93)
	At 5 minutes	72 (87.80)
APGAR Score: < 7	At 1 minute	14 (17.07)
	At 5 minutes	10 (12.20)
Birth Weight (kg)	1.0-1.5	2 (2.44)
	1.5-2.5	20 (24.39)
	2.5-3.5	46 (56.10)
	> 3.5	14 (17.07)
Neonatal Morbidity	Respiratory distress syndrome (RDS)	4 (5.19)
	Birth asphyxia	2 (2.6)
	Septicemia	1 (1.3)
	Meconium aspiration syndrome (MAS)	1 (1.3)
	RDS with septicemia	1 (1.3)
	Neonatal jaundice	1 (1.3)
Total		10 (12.99)
Mean Duration of NICU stay (days)		7.1 $\pm$ 2.8

Causes of Neonatal Mortality (n = 3)	Meconium aspiration syndrome (MAS)	1 (33.33)
	Septicemia	1 (33.33)
	RDS with septicemia	1 (33.33)

Neonatal Outcomes

A total of 82 neonates were born from 77 participants. Among 82 neonates, at one minute, 82.93% had APGAR ≥ 7 ; at five minutes, this improved to 87.8%. The majority of newborns weighed 2.5–3.5 kg (56.1%). Neonatal morbidity was 12.99%, with respiratory distress syndrome (5.19%) being the most common. The mean length of NICU stay was 7.1 ± 2.8 days. Perinatal morbidity was 3.66% (3/82 neonates), with equal contribution from MAS, septicemia, and RDS with septicemia (Table 4).

Discussion

Primary caesarean section in a multigravida woman presents a unique clinical challenge, as previous normal vaginal deliveries often create an expectation of uncomplicated subsequent births. However, changing obstetric trends, evolving maternal demographics, and improved fetal surveillance have contributed to an increasing incidence of primary caesarean section even among women with prior vaginal deliveries. Understanding the indications, intra-operative and post-operative maternal complications, and neonatal outcomes helps in identifying risk factors and improving clinical decision-making. Therefore, this study aims to critically analyse the fetomaternal outcomes associated with primary caesarean section in multigravida women in a tertiary care setting.

In our study, the majority of participants were aged 26–30 years (48.85%), followed by 31–35 years (24.67%) and 21–25 years (23.37%). Only 9.09% were above 36 years. Similarly, Sams S et al., reported maximum number of women undergoing primary caesarean section in multigravida were in the age group of 25–29 years (51.60%), 11.37% women were 20–24 years, 28.43% were 30–34 years and 7.58% women were of age 35 years or more,¹⁴ Khandaker SS et al., reported that among 89 cases, the majority were 18–25 yrs (40.4%), followed by 26–30 yrs (34.8%), while 24.7% were >30 yrs, indicating predominance of younger women.¹⁵ Likewise, Kaur K et al., observed in 476 patients that most belonged to 20–29 yrs (64.7%), also followed by 30–39 yrs (35.51%); in contrast, only 2.52% were 40–45 yrs and 1.26% were <20 yrs.¹⁶ Overall, the predominance of younger age group indicates the typical reproductive age demographic in India.

In our study, the majority of participants (61.04%) belonged to urban areas. Similarly, Tripathy B et al., observed higher LSCS rates in urban populations; for example, Telangana (60.7%), Tamil Nadu (44.9%), and Kerala (42.4%) showed urban predominance.¹⁷ In contrast, Khandaker SS et al., reported that among 89 respondents, 53.9% were from rural areas, while 46.1% belonged to urban areas, showing slight

rural predominance.¹⁵ Several northern and northeastern states recorded lower LSCS rates (5.2–20%), indicating clear urban–rural and regional variation.

In our study, most participants had secondary education (51.95%) and belonged to lower middle class (38.96%) socio-economic status. Similarly, Kumar P et al., reported that 53.08% had secondary education, forming majority, while only 1.42% were illiterate, suggesting most women had at least basic educational attainment. He also reported that 42.18% belonged to lower middle class, followed by 30.33% were from upper lower class.¹⁸ In contrast, Rajput N et al., found that majority of women belonged to upper lower (54.1%).¹⁹

In our study, majority of patients (68.83%) were booked cases, which is higher than Kumar R et al., who reported only 32.52% booked.²⁰ This difference may reflect better awareness and healthcare access in urban populations. However, Samal R et al., reported 97.1% booked cases, suggesting that institutional variations significantly impact booking status.¹⁰

Gravida 2 women comprised the majority (72.73%) in our study, similar to studies by Himabindu P et al., with 63.9%,²¹ Sams S et al (2017) with 67.8%,¹⁴ and Rajput N et al., with 49.73% in second gravida.¹⁹ This consistent pattern indicates that primary caesarean in multigravida is most common in second pregnancies.

Term gestation (36–39+6 weeks) predominated (70.13%), comparable to Kaur K et al., who reported 47.90% in 37–40 weeks and Kumar P et al., with 68.25%.¹⁶ Maternal disorders were present in 19.48%, with PIH (10.39%) being most common. Kaur K et al., reported varied complications with blood transfusion being most common (58 cases).¹⁶ This variation may reflect different study populations and definitions of maternal disorders.

The most common indications in our study were breech presentation (11.69%), meconium-stained liquor (10.39%), failed induction (9.09%), previous two LSCS (9.09%), and oligohydramnios (9.09%). These findings differ from several other studies: Khandaker SS et al., reported fetal distress (20.2%), malpresentation (16.9%), severe pre-eclampsia/eclampsia (15.7%),¹⁵ Kaur K et al., reported fetal distress (26.47%), malpresentation (21.43%),¹⁶ Sams S et al., reported non-reactive CTG (27%), breech (20.4%),¹⁴ and Rao JH et al., reported cephalopelvic disproportion (CPD) (18.5%), fetal distress (17%), placenta previa (15%).²² This variation highlights the diverse nature of indications across different populations and settings.

Emergency caesarean sections accounted for 70.13%,

consistent with studies by Sams S et al., with 81.5%,¹⁴ Rajput N et al., with 72.28%,¹⁹ and Prakash SA et al. with 75%,²³ Singh SM et al., with 74.7%.²⁴ This predominance of emergency sections reflects the unpredictable nature of obstetric emergencies in multigravida women. Spinal anesthesia for caesarean sections predominated (93.51%), comparable to Sams S et al. with 94.8%¹⁴ and Adhikari KM et al., with 95.16%.²⁵ This preference for regional anesthesia aligns with current recommendations favoring spinal over general anesthesia in caesarean sections, to minimize maternal and fetal risks.

Intraoperative complications occurred in 5.19% of cases, with atonic PPH being most common (3.9%), consistent with Kumar P et al. reporting 4.73%.¹⁸ Extension of uterine incision was noted in 1.3%, contrasting with Das SK et al., who reported 30.9% in second-stage LSCS.²⁶ This difference may reflect the lower proportion of prolonged/obstructed labor cases in our study. Postoperative morbidity observed in 11.69%, with secondary PPH being most common (3.9%). Kumar R et al. reported higher morbidity (fever 9.48%),²⁰ while Sams S et al., reported 7.58%.¹⁴ Desai E et al. reported febrile morbidity in 11.63% and wound infection in 10.47%.² The variations reflect different definitions of morbidity, hospital settings, and patient populations.

The majority (56.1%) of the neonates weighed 2.5-3.5 kg, similar to Khandaker SS et al., with 71.9% ≥ 2500 g,¹⁵ Kaur K et al., with 49.02%,¹⁶ and Himabindu P et al., with 75.8%.²¹ At 5 minutes, 87.8% had APGAR ≥ 7 , which is higher than Khandaker SS et al. who reported 36% with APGAR ≥ 7 .¹⁵ Kumar R et al., reported 72.33% with APGAR ≥ 7 .²⁰ The differences may reflect varying emergency- elective ratios and intrapartum monitoring quality. Neonatal morbidity observed in 12.99%, with RDS being most common (5.19%), contrasting with Khandaker SS et al. who reported 60.7% morbidity,¹⁵ and Kumar R et al. with 46.24%.²⁰ Neonatal mortality occurred in 3 cases (3.66%). Kotwal YS et al. reported prematurity (24.2%), septicemia (18.2%) as leading causes.²⁷

The majority (67.53%) used no contraception, with sterilization (23.38%) preferred over IUCD (9.09%). Shekhar C et al., reported 33.3% non-use, 37.9% sterilization;²⁸ Ewerling F et al. reported 71.8% modern method use, 76.1% sterilization.²⁹ The low contraceptive uptake in our study reflects the need for improved postpartum family planning counseling.

However, the present study has certain limitations. The single-centric study design, small sample size, convenience sampling technique, lack of a comparison group, short duration (18 months), and absence of long-term follow-up may limit generalizability and preclude assessment of rare complications and chronic outcomes.

Conclusion

This study concludes that primary caesarean section in

multigravida women at a tertiary care centre is commonly performed due to obstetric complications such as fetal distress, cephalopelvic disproportion, malpresentation, and hypertensive disorders. Timely decision-making and improved surgical techniques contribute to favourable maternal and neonatal outcomes. However, increased risks of intraoperative blood loss, postoperative complications, and NICU admissions remain significant concerns. Proper antenatal care, early risk identification, and skilled obstetric management are essential to reduce morbidity and improve fetomaternal outcomes in multigravida women undergoing primary caesarean section.

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Conflict of Interest

The authors do not have any conflicts of interest.

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