

A Prospective Observational Study on the Fetomaternal Outcome in Term Pregnancies with Breech Presentation

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Abstract: Background: Breech presentation at term poses significant risks for both mother and child, often necessitating careful management to optimize outcomes. This study aimed to evaluate the fetomaternal outcomes associated with term pregnancies presenting with breech. Methods: A prospective observational study was conducted at the Department of Obstetrics and Gynaecology, BMCRC, Ballari, over a 6 month period. A total of 31 pregnant women with breech presentation at term were included. Data were collected on demographic characteristics, gestational age, mode of delivery, neonatal outcomes, and maternal complications. Statistical analysis was performed using IBM SPSS Version 23.0. Results: The majority of participants were between 21 - 25 years of age (74.2%), and 58.1% were primiparous. Most deliveries occurred between 37 - 39 weeks of gestation (51.6%). A significant portion (83.9%) of the deliveries were conducted via cesarean section (LSCS), with "primigravida with breech" being the most common indication (61.3%). Neonatal outcomes were favorable, with a mean Apgar score of 4.16 at 1 minute and 6.42 at 5 minutes. However, 41.9% of newborns required NICU admission. Maternal outcomes were positive, though 6.4% of women experienced postpartum hemorrhage. Conclusion: This study underscores the importance of cesarean delivery in managing breech presentations, particularly in primiparous women, to minimize risks and improve outcomes. While neonatal outcomes were generally favorable, the need for resuscitation and NICU admission highlights the challenges associated with breech deliveries.

Keywords: Breech presentation, Term pregnancy, Cesarean section, Neonatal outcomes, Maternal complications

1. Introduction

Breech presentation occurs in 3% to 5% of all pregnancies at term, accounting for the greatest proportion of non - cephalic presentations. The incidence of breech presentation decreases as pregnancy progresses, from around 25% at 28 weeks to the aforementioned 3 - 5% at term, indicating the natural tendency for most fetuses to assume a cephalic (head down) position as gestation advances^[1].

Sixty - five to seventy per cent of breech babies are in the frank breech position, in which the baby's legs are flexed at the hip and extended at the knees. Other positions include complete breech and footling. Some babies will spontaneously turn to a cephalic position before birth, and others can be rotated using external cephalic version.

Factors which have been associated with breech presentation include: nulliparity, previous breech birth, uterine anomaly, contracted pelvis, placenta previa; cornual placenta, decreased or increased amniotic fluid volume, multiple pregnancy, prematurity, short umbilical cord, impaired foetal growth, foetal anomaly and foetal death.^[2]

Increased rates of maternal and perinatal morbidity are associated with breech presentation regardless of mode of delivery. Complications like genital tract injuries are more common with breech presentation in both vaginal and caesarean delivery in the case of mother, while, for fetus, the

common risk associated is premature delivery, umbilical cord prolapse and birth trauma.^[3]

Historically, vaginal breech delivery was the norm, with cesarean delivery reserved for specific high - risk cases. However, with the publication of the Term Breech Trial in 2000, which demonstrated significantly lower perinatal and neonatal mortality and morbidity with planned cesarean delivery compared to planned vaginal delivery, there was a global shift towards elective CS for breech presentation at term^[6]. The study highlighted that planned cesarean delivery significantly reduced the risk of adverse perinatal outcomes, including intrapartum asphyxia, birth trauma, and neonatal intensive care unit (NICU) admissions^[7].

2. Materials & Methods

1) Study Design

This study was designed as a prospective observational study aimed at assessing the fetomaternal outcomes associated with breech presentation in term pregnancies. The observational nature of the study allowed for a naturalistic examination of clinical practices and outcomes providing real - world insights into the management of breech deliveries. The study was conducted in accordance with established clinical protocols and guidelines, ensuring that all participants received standard care. By observing and recording the outcomes of pregnancies with breech presentation, the study aimed to

identify trends, complications, and best practices within the hospital setting.

2) Study Setting and Duration

The study was conducted in the Department of Obstetrics and Gynecology at BMCRC, Ballari, spanning over 6 months beginning from 1st August 2023 to 31st January 2024.

3) Participants - Inclusion and Exclusion Criteria

The study included all pregnant women admitted to the Department of Obstetrics and Gynecology at BMCRC, Ballari, who met the following criteria.

- **Inclusion criteria:** All pregnant women with >37 weeks of gestation with breech presentation with singleton pregnancy
- **Exclusion criteria:** Failure to give consent, Women <37 weeks of gestation, Multiple pregnancy

4) Study Sample Size

All the patients admitted in the labour room with diagnosis of labour with breech presentation during the course were considered for the study.

5) Study Parameters

Demographic data such as age, parity, and gestational age at birth were collected to understand the characteristics of the study population. Clinical parameters included the mode of delivery, birth weight, Apgar scores, and the need for neonatal intensive care unit (NICU) admission. Additionally, neonatal morbidity was tracked to identify any complications associated with breech deliveries.

6) Study Procedure

After obtaining informed consent, a detailed history and examination were conducted to record demographic data and clinical parameters. The decision regarding the mode of delivery—whether vaginal or cesarean—was made following standard clinical guidelines and was documented along with the indications for cesarean sections when applicable. Post-delivery, both maternal and neonatal outcomes were closely monitored.

7) Study Data Collection

Data were meticulously collected during the course of hospital admission. Information was recorded in a structured format to ensure consistency and completeness. Data points included demographic information, clinical history, and details of the delivery process, as well as postnatal outcomes. The data collection process was ongoing throughout the study period, with regular checks and updates to ensure accuracy. The collected data formed the basis for the subsequent analysis, providing the necessary information to evaluate the outcomes associated with breech presentation in term pregnancies.

8) Data Analysis

The collected data were analyzed using IBM SPSS Statistics software, Version 23.0. Descriptive statistics, including frequency analysis and percentage analysis, were utilized to summarize categorical variables, such as mode of delivery and NICU admissions. For continuous variables like birth weight, the mean and standard deviation (S. D.) were calculated. To determine the significance of associations

between categorical variables, the Chi - Square test or Fisher's exact test was employed, depending on the data distribution and sample size. This rigorous statistical analysis enabled the identification of key trends and associations in the data, contributing to a better understanding of the outcomes of breech presentations.

9) Ethical Considerations

The study was conducted in strict accordance with the ethical guidelines established by the Institutional Ethics Committee of BMCRC, Ballari. Prior to participation, all eligible women were provided with detailed information about the study's purpose, procedures, and potential risks, and informed consent was obtained. Ethical approval was sought and obtained before the commencement of the study.

3. Results

3.1 Demographic Profile of the Respondents

The age distribution of the study participants shows that the majority of term pregnancies with breech presentation occurred in younger women, particularly in the 21 - 25 age group, which constituted 74.2% of the sample. This indicates that breech presentation at term is more common among women in their early reproductive years. A smaller percentage of women (16.1%) were over 25 years of age, while only 9.7% were aged 20 years or younger.

Table 4.1.1: Age Distribution of Respondents

Age (years)	Frequency	Percent
≤ 20	3	9.70%
21 – 25	23	74.20%
> 25	5	16.10%
Total	31	100.00%

The parity data reveals that a significant portion of the breech presentations occurred in primiparous women, who accounted for 58.1% of the cases. Multiparous women with two previous live births followed with 19.4%. This suggests that breech presentation is notably more common in first-time mothers compared to those who have had multiple previous deliveries.

Table 4.1.2: Parity Distribution of Respondents

Parity	Frequency	Percent
P1	18	58.10%
P2	9	29.10%
P3	3	9.70%
P4	1	3.20%
Total	31	100.00%

3.2 Gestational Age and Mode of Delivery

The distribution of gestational age at the time of delivery indicates that most breech presentations occurred between 37 and 39 weeks of gestation, accounting for 51.6% of the cases. The remaining 48.4% of deliveries occurred between 39 and 41 weeks. This pattern suggests that breech presentation at term is fairly evenly distributed across these gestational age ranges.

Table 4.2.1: Gestational Age at Delivery

Gestational Age (weeks)	Frequency	Percent
37 - 39 weeks	16	51.60%
39 - 41 weeks	15	48.40%
Total	31	100.00%

The mode of delivery data shows a strong preference for cesarean sections (LSCS) in cases of breech presentation, with 83.9% of the respondents undergoing LSCS. Only 16.1% of the deliveries were conducted vaginally. This suggests that cesarean section is the preferred mode of delivery in breech presentations at term, likely due to the associated risks of vaginal breech delivery.

Table 4.2.2: Mode of Delivery

Mode of Delivery	Frequency	Percent
LSCS	26	83.90%
Vaginal Delivery	5	16.10%
Total	31	100.00%

3.3 Indications for Cesarean Section

Among the 26 cesarean sections performed, the most common indication was "primi with breech," accounting for 61.3% of cases. Other indications included fetopelvic disproportion (9.7%) and antepartum eclampsia (6.5%). The preference for cesarean delivery in primigravidas with breech presentation reflects clinical caution in managing these cases to avoid complications associated with vaginal breech delivery.

Table 4.3.1: Indications for Cesarean Section (LSCS)

Indication for LSCS	Frequency	Percent
Primi with Breech	19	61.30%
Fetopelvic Disproportion	3	9.70%
Antepartum Eclampsia	2	6.50%
Previous LSCS	1	3.20%
Severe Oligohydramnios	1	3.20%
Total	26	83.90%

3.4 Neonatal Outcomes

The gender distribution of the newborns was fairly balanced, with 48.4% being boys and 51.6% girls. This near - equal distribution indicates no significant gender bias in breech presentations at term.

Table 4.4.1: Neonatal Gender Distribution

Gender	Frequency	Percent
Boy	15	48.40%
Girl	16	51.60%
Total	31	100.00%

Most newborns had a birth weight between 2.6 kg and 3.5 kg, representing 74.2% of the cases, while 25.8% had a birth weight between 1.5 kg and 2.5 kg. This suggests that the majority of breech deliveries resulted in infants with a birth weight within the normal range, although a quarter of the infants were in the lower weight category, potentially indicating a higher risk of complications.

Table 4.4.2: Birth Weight Distribution

Birth Weight (kg)	Frequency	Percent
1.5 kg - 2.5 kg	8	25.80%
2.6 kg - 3.5 kg	23	74.20%
Total	31	100.00%

The Apgar scores recorded at 1 and 5 minutes post - delivery show that most newborns had scores within the normal range. The mean Apgar score at 1 minute was 4.16, and at 5 minutes, it was 6.42. This indicates that while the majority of newborns required some degree of resuscitation, they generally stabilized by 5 minutes.

Table 4.4.3: Apgar Scores

Apgar Score	N	Minimum	Maximum	Mean	Std. Deviation
At 1 minute	31	3	5	4.16	0.523
At 5 minutes	31	5	8	6.42	0.72

In terms of resuscitation, 77.4% of newborns required only tactile stimulation, while 9.7% required bag and mask ventilation. This indicates that while a majority of breech deliveries required some level of intervention immediately after birth, most were manageable with minimal resuscitation efforts.

Table 4.4.4: Neonatal Resuscitation Requirements

Resuscitation Method	Frequency	Percent
Tactile Stimulation	24	77.40%
Bag and Mask	3	9.70%
No Resuscitation Needed	4	12.90%
Total	31	100.00%

NICU admission was required for 41.9% of the newborns, reflecting the high - risk nature of breech presentations. However, 58.1% of the newborns did not require NICU admission, indicating that despite the risks, a majority of the newborns were stable post - delivery.

Table 4.4.5: NICU Admissions

NICU Admission	Frequency	Percent
No	18	58.10%
Yes	13	41.90%
Total	31	100.00%

The study found no neonatal complications in any of the cases, which is a positive outcome, suggesting that the management of breech presentations in this setting is effective in preventing neonatal morbidity.

Table 4.4.6: Neonatal Complications

Neonatal Complications	Frequency	Percent
No	31	100.00%

No neonatal anomalies were noted.

3.5 Maternal Outcomes

In terms of maternal outcomes, 93.5% of the women had no complications post - delivery. However, 6.4% experienced postpartum hemorrhage (PPH), highlighting a significant, albeit low, risk of maternal complications associated with breech delivery.

Table 4.5.1: Maternal Complications

Maternal Outcome	Frequency	Percent
No Complications	29	93.50%
PPH	2	6.40%
Total	31	100.00%

In terms of mullerian anomalies, 90.3% of the women had no anomalies noted. However, 10.7% had mullerian anomalies, highlighting a significant, albeit low, association between breech presentation and mullerian anomaly.

Table 4.5.2: Mullerian anomalies in Mother

Mullerian Anomalies	Mode of Delivery (Vaginal)	Total
Yes	3	10.70%
No	28	90.30%
Total	31	100.00%

Type of Mullerian Development Anomaly

Of the 3 cases who had mullerian anomalies, two of them had bicornuate uterus and one of them had septate uterus.

3.6 Vital Statistics of APGAR and Delivery Mode

The Apgar scores, stratified by the mode of delivery, show that there was no significant difference between LSCS and vaginal deliveries. The mean Apgar score at 1 minute for LSCS was 4.15, while for vaginal delivery, it was 4.20. Similarly, at 5 minutes, the mean scores were 6.42 for LSCS and 6.40 for vaginal delivery, indicating that the mode of delivery did not significantly impact neonatal vitality as measured by Apgar scores.

Table 4.6.1: APGAR Scores by Mode of Delivery

Mode of Delivery	N	Mean	Std. Deviation
APGAR at 1 min (LSCS)	26	4.15	0.543
APGAR at 5 min (LSCS)	26	6.42	0.758
APGAR at 1 min (Vaginal)	5	4.2	0.447
APGAR at 5 min (Vaginal)	5	6.4	0.548

The association between age and mode of delivery was statistically significant (Pearson chi - square = 8.630, p - value = 0.013). Women aged 21 - 25 years were more likely to undergo LSCS compared to those aged ≤ 20 years or > 25 years, who had a higher proportion of vaginal deliveries. This suggests that younger women in the middle age range (21 - 25 years) may be more likely to be managed with cesarean sections in breech presentations.

Table 4.6.2: Association Between Age and Mode of Delivery

Age (years)	Mode of Delivery (LSCS)	Mode of Delivery (Vaginal)	Total
> 25	2	3	5
≤ 20	3	0	3
21 - 25	21	2	23
Total	26	5	31

4. Discussion

This study aims to evaluate the fetomaternal outcomes in term pregnancies with breech presentation, a condition associated with increased risks for both mother and child. The demographic profile of the study participants revealed that the majority of the women (74.2%) were aged between 21 and 25

years, suggesting that breech presentation is more prevalent among younger women. This age group was followed by women aged over 25 years (16.1%) and those aged 20 years or younger (9.7%). These findings are consistent with the understanding that younger women, particularly those in their early reproductive years, are more likely to experience breech presentations. The relatively lower prevalence in women aged over 25 years may be due to higher parity or a different distribution of risk factors in older women.

The parity distribution further supports the association between breech presentation and primiparity. In this study, 58.1% of the women were primiparous, indicating that first-time pregnancies are more likely to result in breech presentation. Multiparous women with two previous live births accounted for 19.4% of the cases, while other parity groups were less represented.

Gestational age at the time of delivery was another critical parameter examined in this study. The data indicated that breech presentations occurred almost equally between 37 - 39 weeks (51.6%) and 39 - 41 weeks (48.4%) of gestation. This distribution highlights the unpredictability of breech presentation timing, which can occur throughout the latter stages of pregnancy. It also underscores the importance of timely prenatal care and monitoring to identify and manage breech presentations effectively before delivery.

The mode of delivery in breech presentations is a subject of considerable clinical debate, with cesarean sections (LSCS) often being preferred due to the associated risks of vaginal breech delivery. In this study, a significant majority of the deliveries (83.9%) were conducted via LSCS, with only 16.1% being vaginal deliveries. This strong preference for cesarean sections reflects the cautious approach often taken by obstetricians to minimize the risks of complications such as birth trauma and asphyxia, which are more common in vaginal breech deliveries. The high rate of cesarean sections in this study is in line with global trends, where LSCS is the recommended mode of delivery for breech presentations in many clinical guidelines.

The indications for cesarean section in this cohort were predominantly "primi with breech" which accounted for 61.3% of the cases. This finding suggests that clinicians are particularly cautious with primigravidas presenting in breech, opting for cesarean delivery to avoid complications associated with vaginal breech birth. Other indications included fetopelvic disproportion (9.7%), antepartum eclampsia (6.5%), and severe oligohydramnios (3.2%). The diverse range of indications highlights the complexity of clinical decision - making in breech presentations, where multiple factors must be considered to ensure the safest delivery outcome for both mother and child.

Neonatal outcomes were closely monitored in this study, birth weight, Apgar scores, resuscitation needs, NICU admissions, and complications. The gender distribution of newborns was nearly equal, with 48.4% boys and 51.6% girls, indicating no gender - related predisposition to breech presentation. Birth weight analysis revealed that 74.2% of the newborns weighed between 2.6 kg and 3.5 kg, a range considered within normal limits, while 25.8% weighed between 1.5 kg and 2.5 kg,

potentially indicating a higher risk of neonatal complications. However, despite these variations in birth weight, the study found no significant neonatal complications, with all 31 newborns surviving without major issues.

Apgar scores, which are critical indicators of neonatal well-being immediately after birth, showed that most newborns had scores within the normal range. The mean Apgar score at 1 minute was 4.16, improving to 6.42 at 5 minutes, indicating that while some newborns required initial resuscitation, most stabilized shortly after birth. The need for resuscitation was observed in 77.4% of the cases, with tactile stimulation being the most common intervention, followed by bag and mask ventilation (9.7%). Despite these interventions, 41.9% of the newborns required NICU admission, reflecting the inherent risks associated with breech delivery, even in the absence of complications.

The association between maternal age and mode of delivery was statistically significant, with a Pearson chi - square value of 8.630 and a p - value of 0.013. Women aged 21 - 25 years were more likely to undergo LSCS compared to those aged \leq 20 years or $>$ 25 years. This finding suggests that younger women, particularly those in their early 20s, may be managed more conservatively with cesarean sections in cases of breech presentation, possibly due to concerns about the risks associated with vaginal delivery in this age group.

Maternal outcomes were positive with 93.5% of the women experiencing no complications post - delivery. However, 6.4% of the women developed postpartum hemorrhage (PPH), a known risk in breech deliveries due to factors such as uterine atony or trauma during delivery. The relatively low incidence of PPH in this study is encouraging, indicating that with appropriate management, the risks associated with breech delivery can be minimized.

Despite the evidence favoring cesarean delivery, the decision - making process for the mode of delivery in breech presentations is complex and influenced by multiple factors, including maternal preferences, obstetrician experience, and institutional policies^[9]. The safety and feasibility of vaginal breech delivery remain subjects of considerable debate, with some studies suggesting that with proper selection criteria, experienced obstetricians, and appropriate facilities, vaginal breech delivery can be a safe option^[10]. However, the declining experience and training in vaginal breech delivery among obstetricians due to the predominance of cesarean sections have raised concerns about the availability of skilled practitioners capable of safely managing such deliveries^[11].

The management of breech presentation also involves the consideration of external cephalic version (ECV), a procedure in which the fetus is manually turned to a head - down position before labor begins. In this study however, ECV was not done.

5. Conclusion

The findings in this study highlight the high prevalence of cesarean sections in managing breech deliveries, particularly in primigravidas, and underscore the need for careful monitoring and timely intervention to ensure positive

outcomes. While the neonatal outcomes were favorable, the significant number of NICU admissions and the need for resuscitation emphasize the importance of preparedness even in LSCS with correct breech extraction techniques. This study contributes to the growing body of evidence supporting the operative management of breech deliveries to minimize risks and optimize both maternal and neonatal outcomes.

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