International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Sirsam SS et al. Int J Reprod Contracept Obstet Gynecol. 2025 Dec;14(12):4312-4316
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20253903

Original Research Article

Maternal and fetal outcomes in pregnancy beyond 40 weeks of gestation: an observational study

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Received: 18 October 2025
Revised: 13 November 2025
Accepted: 14 November 2025

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ABSTRACT

Background: Pregnancy beyond 40 weeks, or postdated pregnancy, is associated with increased maternal and perinatal morbidity. The present study aimed to evaluate maternal and fetal outcomes in pregnancies extending beyond 40 weeks of gestation.
Methods: This prospective observational study was conducted among 200 pregnant women with gestational age >40 weeks admitted to the department of obstetrics and gynaecology, government medical college and hospital, Akola, Maharashtra. Data were collected regarding maternal demographics, mode of delivery, onset of labor, complications, and neonatal outcomes. Statistical analysis was performed using descriptive methods.
Results: The mean maternal age was 26.7±3.2 years, with 64.5% being primigravida. Sixty percent of women delivered at term (40-40+6 weeks), 30% at late term (41-41+6 weeks), and 10% beyond 42 weeks. Vaginal delivery occurred in 63.3% and caesarean section in 36.7% of cases. Labor induction was required in 45%, predominantly using prostaglandins. Maternal complications included oligohydramnios (25%), prolonged labor (20.5%), and postpartum hemorrhage (19%). Fetal complications included fetal distress (29%) and meconium-stained liquor (23%). NICU admission was needed in 18% of neonates, mainly for respiratory distress, hypoglycemia, and perinatal asphyxia. Most neonates (81.6%) had normal birth weight (2.5-3.9 kg), with 12.2% macrosomic.
Conclusions: While most postdated pregnancies had favourable outcomes, maternal and neonatal risks increased with advancing gestation. Early identification, timely induction, and vigilant intrapartum monitoring are essential to optimize outcomes in pregnancies beyond 40 weeks.

Keywords: Postdated pregnancy, Maternal outcomes, Fetal outcomes

INTRODUCTION

Pregnancy beyond 40 completed weeks (late-term and post-term pregnancy) remains an important clinical dilemma in obstetrics. Despite advances in antenatal care, prolonged gestation is associated with increased maternal and perinatal risks such as oligohydramnios, fetal distress, operative delivery, meconium aspiration, and stillbirth.[1-3] The physiological basis includes placental aging, reduced amniotic fluid, and increased uteroplacental insufficiency.[4] Several observational studies have demonstrated that the risk of maternal and obstetric complications increases with gestational age beyond term.[5,6] However, optimal timing of induction, monitoring strategies, and management protocols remains controversial.[7]

In the Indian context, resource constraints, variability in obstetric practices, and patient preferences further complicate the decision-making process. There is a paucity of prospective data from tertiary care centers in western Maharashtra on maternal and fetal outcomes in

pregnancies extending beyond term. This study was undertaken to fill this gap by prospectively observing pregnancies beyond 40 weeks in a tertiary hospital and quantifying maternal and fetal outcomes, as well as identifying risk factors for adverse events. Our objectives were (1) to describe maternal complications, mode of delivery, and neonatal outcomes in pregnancies >40 weeks, and (2) to examine associations of gestational age strata (e.g. 40+0–40+6, 41+0–41+6, ≥42+0 weeks) with adverse outcomes.

METHODS

This prospective observational study was conducted in the department of obstetrics and gynaecology, government medical college and hospital, Akola, Maharashtra, over a period of 18 months (March 2023-October 2024). The study included all pregnant women with gestational age beyond 40 weeks, confirmed either by reliable last menstrual period or first-trimester ultrasonography. Women with unknown dates, irregular menstrual cycles, multiple gestations, major fetal anomalies, or significant medical disorders requiring early delivery were excluded. A total of 200 eligible and consenting women were enrolled using universal sampling.

After obtaining institutional ethics committee approval and written informed consent, detailed obstetric and medical histories were recorded, followed by thorough general and obstetric examinations. Gestational age, fetal presentation, amniotic fluid volume, and cervical status were assessed. Women in spontaneous labor were monitored using a partogram and managed according to standard obstetric protocols. Those not in labor were induced after 40 weeks using prostaglandin E_2 gel, oxytocin, or a combination, depending on Bishop's score and obstetric indication. Caesarean delivery indications and intra- or postpartum complications were documented. Maternal outcomes such as mode of delivery, prolonged labor, postpartum hemorrhage, perineal trauma, and need for blood transfusion were recorded. Fetal outcomes included liquor status, Apgar scores, birth weight, meconium aspiration, NICU admission, and perinatal mortality.

All data were compiled in Microsoft excel and analyzed using SPSS version 16. Continuous variables were summarized as mean±standard deviation, and categorical data as frequencies and percentages. Statistical significance of associations between gestational age and outcomes was assessed using Chi-square or Fisher's exact tests, and $p<0.05$ was considered significant.

RESULTS

Labor characteristics and mode of delivery

Spontaneous onset of labor occurred in 55% of women, while 45% required induction, most commonly using prostaglandins (51.1%) followed by oxytocin (40%). The mean induction-to-delivery interval was 10.6±3.5 hours. Vaginal delivery occurred in 63.3% of cases, whereas 36.7% underwent caesarean section. The caesarean rate increased with gestational age-30% at 40-40+6 weeks, 40% at 41-41+6 weeks, and 65% beyond 42 weeks (p=0.03). The most frequent indications for caesarean delivery were fetal distress (28%) and meconium-stained liquor (22%).

Table 1: Demographic and baseline characteristics of study participants, (n=200).

Parameters	Category	N	Percentage (%)
Age (in years)	22-25	83	41.5
	26-29	79	39.5
	30-33	33	16.5
	34-37	5	2.5
Mean±SD	26.7±3.20 years		
Parity	Primigravida	129	64.5
	Multigravida	71	35.5
Gestational age (in weeks)	40-40+6	120	60
	41-41+6	60	30
	≥42	20	10

Table 2: Mode of delivery and labor characteristics, (n=200).

Parameters	N
Spontaneous labor	110 (55%)
Induced labor	90 (45%)
Vaginal delivery	127 (63.3%)
Caesarean section	73 (36.7%)
Failed induction	25 (12.5%)

Maternal outcomes

Maternal complications were observed in 69% of cases. The most common were oligohydramnios (25%), prolonged labor (20.5%), and postpartum hemorrhage (19%). Perineal and cervical tears occurred in 13.5% and 6%, respectively. Wound infection was seen in 8%, while 10.5% required blood transfusion. Severe complications such as obstructed labor (4.5%), ICU admission (3%), and hysterectomy (0.5%) were rare. The overall maternal morbidity was significantly higher in pregnancies extending beyond 41 weeks.

Table 3: Maternal complications, (n=200).

Complications	N	Percentage (%)
Oligohydramnios	50	25.0
Prolonged labor	41	20.5
Postpartum hemorrhage	38	19.0
Perineal tear	27	13.5
Wound infection	16	8.0
Need for blood transfusion	21	10.5
ICU admission	6	3.0

Fetal and neonatal outcomes

Fetal distress was the most frequent complication, occurring in 29% of cases, followed by meconium-stained liquor (23%). Low Apgar scores (<7 at 1 minute) were recorded in 17%, and 6% had Apgar <7 at 5 minutes. NICU admissions were required in 18% of neonates, primarily for respiratory distress (39%), hypoglycemia (33%), and perinatal asphyxia (31%). There were two perinatal deaths (1%), one due to meconium aspiration and one from severe asphyxia.

Table 4: Neonatal outcomes, (n=200).

Outcomes	N	Percentage (%)
Fetal distress	58	29
Meconium-stained liquor	46	23
NICU admission	36	18
Meconium aspiration syndrome	10	5
Neonatal hypoglycemia	16	8
Low Apgar (<7 @ 1 min)	34	17
Perinatal death	2	1

Birth weight distribution

Among live births (n=196), the majority (81.6%) had normal birth weight (2.5-3.9 kg), 12.2% were macrosomic (≥ 4 kg), and 6.1% were low birth weight (<2.5 kg). Macrosomia was significantly associated with gestational age beyond 41 weeks (p=0.01).

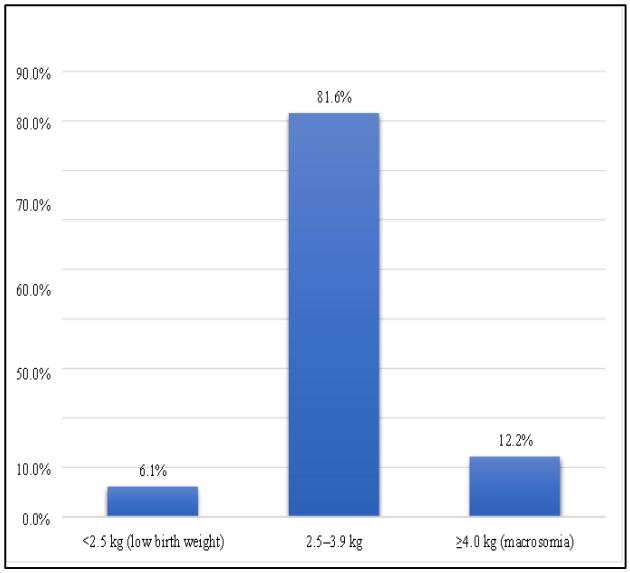

Figure 1: Distribution of birth weight among live births, (n=196).

Correlation with gestational age

With advancing gestation, both maternal and fetal complications increased proportionally. The rate of caesarean section, meconium-stained liquor, fetal distress, and NICU admissions rose significantly in pregnancies ≥41 weeks ($p<0.05$). Postpartum hemorrhage and oligohydramnios were also more frequent after 41 weeks, reflecting deteriorating placental function and labor inefficiency.

DISCUSSION

In this prospective observational study of 200 women with pregnancies extending beyond 40 weeks, maternal and neonatal complications were found to increase progressively with advancing gestational age. The caesarean section rate rose from 30% at 40-40+6 weeks to 65% beyond 42 weeks, and fetal distress, meconium-stained liquor, and NICU admissions also increased significantly. These findings reaffirm the well-established association between prolonged gestation and adverse fetomaternal outcomes reported by Kori et al, Pipaliya et al, and Botcha et al in similar tertiary care populations across India.[8-10]

The proportion of patients requiring induction of labour (45%) in our study was slightly higher than that reported by Thobbi and Nazish et al and Golait and Soni et al who noted induction rates of 35-40%.[11,12] The most common indications were post-dated pregnancy and oligohydramnios, paralleling the findings of Krishna et al and Patil et al.[13,14] The caesarean rate of 36.7% is comparable with Chhetri et al and Awoyesuku et al who reported rates between 32-40%, with fetal distress and failed induction as the leading indications.[15,16] These results highlight the challenge of achieving vaginal delivery in the setting of declining placental function and reduced amniotic fluid near or beyond 41 weeks.

Among maternal complications, oligohydramnios (25%), prolonged labour (20.5%), and postpartum haemorrhage (19%) predominated. This is consistent with observations by Turkmen et al who linked oligohydramnios to declining placental perfusion, and Caughey et al who demonstrated a steady rise in maternal morbidity beyond term.[1,4] A similar pattern was reported by Galal et al who attributed these complications to placental aging, altered prostaglandin metabolism, and reduced uterine contractility.[2]

Neonatal complications also increased with gestational age. Fetal distress (29%), meconium-stained liquor (23%), and NICU admission (18%) were most common. The incidence of meconium aspiration syndrome (5%) was comparable to that reported by Galal et al and Kay et al.[2,6] He et al noted that the risk of perinatal morbidity doubled beyond 41 weeks, primarily due to meconium aspiration, hypoxia, and macrosomia.[17] In our study, macrosomia (12.2%) was significantly associated with post-term pregnancy, consistent with findings of Kori et al.[8] Perinatal mortality in this study was 1%, similar to the 0.8-1.2% reported by Awoyesuku et al and Turkmen et al but higher than that found in developed settings where continuous

intrapartum surveillance is available.[4,16] Mya et al analysing WHO multicountry data, observed a doubling of stillbirth risk beyond 41 weeks, particularly in low-resource facilities.[18]

The debate regarding optimal timing of induction versus expectant management remains ongoing. ACOG recommends offering induction at 41 weeks to reduce stillbirth and meconium aspiration, while NICE and FIGO suggest induction between 41-42 weeks. The ARRIVE trial found that elective induction between 39-41 weeks decreased perinatal complications without increasing caesarean rates.[19,20] Similarly, the SWEPIS trial reported fewer perinatal deaths and improved neonatal outcomes with induction at 41 weeks compared to expectant management.[21] In India, FOGSI recommends induction by 41+3 weeks, acknowledging limitations in intrapartum monitoring.[7] Our findings support this approach: most adverse outcomes were clustered after 41 weeks.

Physiologically, the complications of post-dated pregnancy are explained by placental senescence, vascular sclerosis, and decreased nutrient exchange leading to intrauterine hypoxia. Caughey et al and Galal et al proposed that hormonal dysregulation-persistent progesterone dominance and diminished oxytocin receptor sensitivity-delays spontaneous labour onset.[1,2] These mechanisms, combined with reduced amniotic fluid and cord compression, predispose to fetal distress and acidosis.

Limitations

This study was limited by its single-center design and relatively small post-term subgroup, which may restrict generalizability. The observational nature of the study also prevents establishing causal relationships. Variations in intrapartum monitoring, clinician judgment, and absence of advanced fetal surveillance tools such as Doppler/ biochemical markers may have influenced outcomes. Larger multicentric studies are needed to validate these findings.

CONCLUSION

Pregnancies extending beyond 40 weeks were associated with a progressive rise in maternal and neonatal complications, particularly after 41 weeks of gestation. Increased rates of oligohydramnios, prolonged labor, postpartum hemorrhage, fetal distress, meconium-stained liquor, caesarean delivery, NICU admissions, and macrosomia highlight the clinical challenges of managing late-term and post-term pregnancies. While most women and neonates had favourable outcomes with timely intervention, advancing gestation clearly correlated with heightened risk. These findings underscore need for vigilant antenatal surveillance, timely decision-making regarding induction of labor and robust intrapartum monitoring. Implementing evidence-based protocols and individualized risk assessment can significantly optimize maternal and neonatal outcomes in pregnancies beyond 40 weeks.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Sirsam SS, Jawir GM, Patil BV, Wahane A, Padole MS. Maternal and fetal outcomes in pregnancy beyond 40 weeks of gestation: an observational study. Int J Reprod Contracept Obstet Gynecol 2025;14:4312-6.