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Original Research Article

FETO-MATERNAL OUTCOMES OF INDUCTION OF LABOUR IN WOMEN WITH POST-TERM PREGNANCIES

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Abstract: *Post-term pregnancies are associated with increased risks for both maternal and neonatal complications. Labor induction is a common intervention to reduce these risks; however, its outcomes remain variable. Understanding the fetomaternal outcomes of labor induction in post-term pregnancies is crucial for optimizing clinical management and decision-making.* ***Objective:*** *To evaluate the fetomaternal outcomes of labor induction in women with post-term pregnancies presenting at a tertiary care facility.* ***Methods:*** *This descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynecology from March 2024 to September 2024. A total of 115 women aged 18 to 40 years with postdated pregnancies, regular menstrual cycles, and singleton vertex presentations were enrolled. High-risk pregnancies and those with prior cesarean sections or congenital fetal anomalies were excluded. Labor was induced using sublingual misoprostol (25 µg every four hours for up to four doses). Outcomes, including postpartum hemorrhage (PPH), cesarean delivery, prolonged hospital stay, birth asphyxia, neonatal intensive care unit (NICU) admissions, and meconium aspiration, were assessed.* ***Results:*** *Cesarean sections occurred in 20.9% of cases, and 17.4% experienced PPH. Prolonged hospital stays were recorded in 15.7% of participants. Birth asphyxia was observed in 11.3% of neonates, while 16.5% required NICU admission. Meconium aspiration was noted in 12.2% of cases. No notable associations were found between maternal age or parity and the assessed outcomes ($p > 0.05$).* ***Conclusion:*** *Labor induction in post-term pregnancies is associated with a higher prevalence of cesarean delivery, PPH, and neonatal complications, including NICU admissions and meconium aspiration. These findings highlight the importance of timely interventions and vigilant monitoring to optimize outcomes in post-term pregnancies.*

Keywords: Post-Term Pregnancy, Labor Induction, Cesarean Section, Postpartum Hemorrhage, Neonatal Outcomes, NICU

Introduction

A pregnancy that lasts longer than 42 weeks, measured from the first day of the last menstrual period, as well as 41 weeks as well 3 days from conception, is referred to as post-term pregnancy. Because of the increased risks it presents to the mother and the foetus, post-term pregnancy is a critical obstetric condition. Although post-term pregnancies account for 5-10% of all pregnancies, they have been linked to a number of characteristics, including first pregnancies, prior post-term pregnancies, and maternal obesity, especially advanced maternal age. Inaccurate LMP dates or disparities in ultrasound-based estimations may also lead to miscalculations of the due date, which may result in the perception of a post-term pregnancy (1-4).

Induction of labor is a clinical procedure designed to initiate uterine contractions prior to the onset of spontaneous labor, with the objective of facilitating a vaginal delivery. This intervention is generally undertaken when there are health concerns for the mother or fetus, or when a pregnancy surpasses the ideal duration, particularly in post-term cases, where the likelihood of complications such as fetal distress, macrosomia, and placental insufficiency rises (5). However, a significant area of debate has centered on its advantages for term pregnancies (6). It has been shown that IOL enhances outcomes for both mothers and fetuses in post-term pregnancies (7). Induction is often carried out for social or geographic reasons, lacking a sound medical justification for the procedure. 8 Numerous meticulously designed studies have been carried out to evaluate induction for these various medical causes (9, 10).

The state of the cervix serves as the primary indicator of the probability of success. A non-vaginal delivery is more probable when the cervix has not reached maturity (11). Inducing labor during weeks 37 as well as 41 has the greatest potential to improve neonatal outcomes since gestation lasting more than 37 weeks is associated with an accelerated progression in perinatal death and fetal compromise (12). The choice to induce labor involves a thorough evaluation of the mother's health, the baby's condition, and the readiness of the cervix, aiming to facilitate a safe and effective delivery while reducing the likelihood of complications (13).

One crucial strategy for lowering the dangers of prolonged gestation, which can have detrimental effects on both the mother and the fetus, is the induction of labor in women with post-term pregnancies. The rationale behind examining the feto-maternal outcomes of induction in this population is to identify the most effective timing and techniques for induction, aiming to weigh the advantages of mitigating complications against the possible risks associated with the induction process.

Methodology

This cross-sectional study aimed to assess the outcomes of postdate pregnancies following labour induction in a tertiary

care facility. The research was conducted in the Department of Obstetrics and Gynaecology of Khyber Teaching Hospital Peshawar over a six-month duration, from March 2024 to September 2024 after taking ethical permission from the hospital. A total of 115 women with postdated pregnancies were selected through non-probability consecutive sampling.

Women between the ages of 18 and 40 with regular menstrual cycles, carrying singleton pregnancies in vertex presentation, and presenting uncomplicated antenatal cases beyond 40 weeks of gestation were included in the study. The exclusion criteria included high-risk pregnancies characterised by complications such as diabetes, antepartum haemorrhage, premature rupture of membranes, pregnancy-induced hypertension, heart disease, chronic renal or hypertensive conditions, previous caesarean sections, and congenital foetal anomalies.

Participants who met the inclusion criteria were recruited from the outpatient department. Informed consent was obtained following an explanation of the study's purpose, procedure, risks, and benefits. The principal investigator documented demographic information, encompassing age, residential and educational status, parity, height, weight and body mass index (BMI).

Labour induction utilised sublingual misoprostol at a dosage of 25 µg administered every four hours, with a maximum of four doses over a 24-hour period. The evaluated outcomes comprised postpartum haemorrhage (PPH), caesarean section, extended hospital stay, birth asphyxia, neonatal intensive care unit (NICU) admissions, and meconium aspiration. Postpartum haemorrhage (PPH) is characterised by blood loss surpassing 500 ml following spontaneous vaginal delivery and 1000 ml after caesarean sections, with measurement conducted using a kidney tray. A postpartum hospital stay longer than seven days was categorised as prolonged.

Data were collected through a pre-designed proforma and analysed with SPSS version 24. Continuous variables, including age, height, weight, and BMI, were reported as means with standard deviations or medians with interquartile ranges, as applicable. Categorical data such as NICU admissions, birth asphyxia, meconium aspiration, parity, caesarean sections, PPH, and prolonged hospital stays were reported in terms of frequencies and percentages. Stratification was utilised to account for potential effect modifiers including age, parity, and BMI. A chi-square test was performed following post-stratification to assess statistical significance, with a p-value of ≤ 0.05 deemed significant.

Results

The study population included 115 women aged between 18 and 40 years, with a mean age of 28.71 ± 6.60 years. The average body mass index (BMI) was recorded as 25.66 ± 1.23 kg/m², with values ranging between 23.03 and 28.16.

In terms of maternal outcomes, caesarean sections occurred in 20.9% of cases (24 out of 115), whereas 79.1% (91 out of 115) of participants experienced vaginal deliveries. Postpartum haemorrhage (PPH) occurred in 17.4% (20/115) of participants, while prolonged hospital stays beyond the anticipated duration were recorded in 15.7% (18/115).

Foetal outcomes revealed that birth asphyxia was present in 11.3% (13/115) of neonates, while 88.7% (102/115) exhibited no signs of asphyxia. NICU admissions were necessary for 16.5% (19/115) of neonates, with 12.2% (14/115) experiencing meconium aspiration; conversely, the majority, 87.8% (101/115), showed no signs of aspiration.

In the analysis of maternal outcomes related to age, caesarean sections occurred more frequently in women aged 18 to 30 years (62.5%) than in those aged 31 to 40 years (37.5%). PPH and prolonged hospital stays exhibited a relatively uniform distribution across the two age groups, with no notable statistical differences (p-values of 0.73 and 0.54, respectively). No statistically notable differences related to age were found for NICU admissions, birth asphyxia, or meconium aspiration ($p > 0.05$ for all comparisons).

Parity analysis indicated no notable differences in fetomaternal outcomes between women with a parity of 0 to 3 and those with a parity exceeding 3. The incidence of PPH was 60.0% in the 0-to-3 parity group, whereas it was 40.0% in the higher parity group ($p = 0.54$). Prolonged hospital stays, caesarean sections, birth asphyxia, NICU admissions, and meconium aspiration exhibited no notable differences among the parity groups ($p > 0.05$ for all outcomes).

The findings indicate a high occurrence of caesarean deliveries, postpartum haemorrhage, NICU admissions, and meconium aspiration within the study cohort, with no notable associations observed related to age or parity for these outcomes.

Table 1: Descriptive statistics

Descriptive Statistics	Minimum	Maximum	Mean	Std. Deviation
Age (Years)	18	40	28.71	6.597
BMI	23.03	28.16	25.6647	1.22808

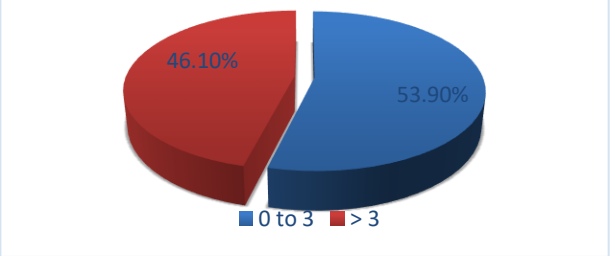

Figure 1 Parity distribution of the patients

Table 2: Maternal outcomes

Maternal outcomes		Frequency	%
Caesarean section	Yes	24	20.9%
	No	91	79.1%
Postpartum Hemorrhage	Yes	20	17.4%
	No	95	82.6%
Prolonged hospital stay	Yes	18	15.7%
	No	97	84.3%

Table 3: Fetal outcomes

Fetal outcomes		Frequency	%
Birth asphyxia	Yes	13	11.3%
	No	102	88.7%
NICU admission	Yes	19	16.5%
	No	96	83.5%
Meconium aspiration	Yes	14	12.2%
	No	101	87.8%

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Table 4: Association of fetomaternal outcomes with age

Fetomaternal outcomes		Age distribution (Years)				P value
		18 to 30		31 to 40		
		N	%	N%	Row N %	
Postpartum Hemorrhage	Yes	12	60.0%	8	40.0%	0.73
	No	53	55.8%	42	44.2%	
Prolonged hospital stay	Yes	9	50.0%	9	50.0%	0.54
	No	56	57.7%	41	42.3%	
Caesarean section	Yes	15	62.5%	9	37.5%	0.50
	No	50	54.9%	41	45.1%	
Birth asphyxia	Yes	7	53.8%	6	46.2%	0.83
	No	58	56.9%	44	43.1%	
NICU admission	Yes	9	47.4%	10	52.6%	0.27
	No	56	58.3%	40	41.7%	
Meconium aspiration	Yes	6	42.9%	8	57.1%	0.37
	No	59	58.4%	42	41.6%	

Table 5: Association of fetomaternal outcomes with parity

Fetomaternal outcomes		Parity				P value
		0 to 3		> 3		
		N	%	N	%	
Postpartum Hemorrhage	Yes	12	60.0%	8	40.0%	0.54
	No	50	52.6%	45	47.4%	
Prolonged hospital stay	Yes	9	50.0%	9	50.0%	0.71
	No	53	54.6%	44	45.4%	
Caesarean section	Yes	13	54.2%	11	45.8%	0.97
	No	49	53.8%	42	46.2%	
Birth asphyxia	Yes	8	61.5%	5	38.5%	0.55
	No	54	52.9%	48	47.1%	
NICU admission	Yes	10	52.6%	9	47.4%	0.90
	No	52	54.2%	44	45.8%	
Meconium aspiration	Yes	7	50.0%	7	50.0%	0.75
	No	55	54.5%	46	45.5%	

Discussion

The current study sought to evaluate fetomaternal outcomes in cases of post-term pregnancies with labor induction. Our findings, which include significant rates of cesarean delivery, postpartum hemorrhage (PPH), prolonged hospital stays, neonatal complications, and other adverse outcomes, are consistent with those reported in various studies in the literature. In our study, caesarean delivery occurred in 20.9% of cases. This is consistent with the findings of Kazi S et al., who documented a caesarean section rate of 13% among women undergoing labour induction for post-term pregnancies (14). Thangarajah et al. observed a caesarean section rate of 33.8% for induced post-term pregnancies, in contrast to 21.1% for spontaneously managed cases, indicating that labour induction may increase the likelihood of operative delivery (15). The discrepancies in caesarean section rates across various studies can be ascribed to variations in patient characteristics, induction protocols, and criteria for clinical decision-making.

Postpartum hemorrhage was observed in 17.4% of women in our cohort. This value is consistent with reports by Botcha H et al., who emphasized that PPH remains a significant maternal complication, especially in post-term pregnancies where prolonged labor and macrosomia may increase risks (16). Kandalgaonkar VP et al. also supported these findings, stating that PPH is a frequent outcome of postdated pregnancies due to uterine atony or prolonged second-stage labor (17). The slightly lower or higher frequencies reported across studies could reflect differences in patient populations or institutional protocols for managing PPH.

The incidence of extended hospitalisation in our study was 15.7%. This finding supports the work of Kazi S et al., who reported a comparable rate of prolonged hospitalisation (17%), mainly attributed to maternal or neonatal complications following delivery (14). Extended hospitalisations frequently correlate with surgical deliveries and neonatal admissions, as evidenced by various studies. Kandalgaonkar VP et al. observed that extended hospitalisation was more prevalent in cases necessitating NICU admissions or associated with maternal morbidities, including PPH or perineal trauma (17). In our study, neonatal outcomes indicated that 11.3% of neonates experienced birth asphyxia, and 16.5% required admission to the NICU. Meconium aspiration occurred in 12.2% of neonates. The findings align with those of Botcha H et al., who reported a significant increase in neonatal morbidity after 41 weeks of gestation, with prevalent complications such as birth asphyxia, NICU admissions, and meconium aspiration syndrome (16). Suliman AA et al. reported a 14.5% incidence of foetal complications in post-term pregnancies, encompassing birth asphyxia and meconium aspiration, frequently associated with prolonged labour and intrauterine stress (18). Thangarajah F et al. highlighted the relationship between gestational age and NICU admissions,

noting a significant increase in the risk of adverse neonatal outcomes beyond 41 weeks (15). The findings underscore the significance of prompt interventions in the management of post-term pregnancies to reduce neonatal morbidity.

Comparing maternal outcomes with respect to age in our study, we found no statistically significant associations between age groups and outcomes such as PPH, cesarean delivery, or prolonged hospital stays. Similarly, Kazi S et al. reported that maternal age was not a significant determinant of most maternal outcomes in induced labors (14).

Parity analysis in our cohort also did not reveal significant differences in maternal or neonatal outcomes between low-parity (0–3) and high-parity (>3) groups. This is in line with findings by Kandalgaonkar VP et al., who observed that parity was not a major determinant of outcomes such as cesarean delivery, PPH, or neonatal morbidity (17).

In summary, our findings align with the body of literature emphasizing the heightened risks associated with post-term pregnancies and labor induction. The high rates of cesarean delivery, PPH, NICU admissions, and neonatal complications observed in our study highlight the need for vigilant monitoring and timely interventions.

Conclusion

The study concludes that labour induction in women with post-term pregnancies correlates with higher rates of caesarean delivery, postpartum haemorrhage, and extended hospital stays, as well as notable neonatal complications including birth asphyxia, meconium aspiration, and NICU admissions. The findings underscore the necessity for prompt intervention, tailored management, and careful monitoring to enhance fetomaternal outcomes in post-term pregnancies.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate
Approved by the department Concerned.

Consent for publication
Approved

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Not applicable

Conflict of interest

The authors declared absence of conflict of interest.

Author Contribution

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Conception of Study, Study Design, and Data analysis.
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Review of literature

References

1. Vayssière C, Haumonte JB, Chantry A, Coatleven F, Debord MP, Gomez C, et al. Prolonged and post-term pregnancies: guidelines for clinical practice from the French College of Gynecologists and Obstetricians (CNGOF). Eur J Obstet Gynecol Reprod Biol. 2013;169(1):10-6.
2. Galal M, Symonds I, Murray H, Petraglia F, Smith R. Postterm pregnancy. Obstet Gynaecol. 2012;4(3):175-9.
3. Behrens I, Basit S, Melbye M, Lykke JA, Wohlfahrt J, Bundgaard H, et al. Risk of post-pregnancy hypertension in women with a history of hypertensive disorders of pregnancy: nationwide cohort study. BMJ. 2017.
4. Bricker L, Medley N, Pratt JJ. Routine ultrasound in late pregnancy (after 24 weeks' gestation). Cochrane database of systematic reviews. 2015.
5. Vogel JP, Souza JP, Gülmezoglu AM. Patterns and outcomes of induction of labour in Africa and Asia: a secondary analysis of the WHO global survey on maternal and neonatal health. PloS one. 2013;8(6):e65612.
6. Suchika G, Usha S, Premlata M, Madhu M. To study the fetomaternal outcome and progress of labour among induced versus spontaneous labour in nulliparous women (using modified WHO partograph). Sch J App Med Sci. 2014;2(5A):157780.
7. Guerra GV, Cecatti JG, Souza JP, Faúndes A, Morais SS, Gülmezoglu AM, et al. World Health Organisation 2005 Global Survey on Maternal and Perinatal Health Research Group. Factors and outcomes associated with the induction of labour in Latin America. Int J Obstet Gynaecol. 2009;116(13):1762-72.
8. Lu L, Qu Y, Tang J, Chen D, Mu D. Risk factors associated with late preterm births in the underdeveloped region of China: A cohort study and systematic review. Taiwan J Obstet Gynecol. 2015;54(6):647-53.
9. Akinsipe DC, Villalobos LE, Ridley RT. A systematic review of implementing an elective labor induction policy. J Obstet Gynecol Neonat Nurs. 2012;41(1):5-16.
10. Alavifard S, Meier K, Shulman Y, Tomlinson G, D'Souza R. Derivation and validation of a model predicting the likelihood of vaginal birth following labour induction. BMC Pregnancy Childbirth. 2019;19:1-9.
11. Coates D, Makris A, Catling C, Henry A, Scarf V, Watts N, et al. A systematic scoping review of clinical indications for induction of labour. Plos One. 2020;15(1):e0228196.
12. Stock SJ, Ferguson E, Duffy A, Ford I, Chalmers J, Norman JE. Outcomes of elective induction of labour compared with expectant management: population based study. BMJ. 2012.
13. Coates R, Cupples G, Scamell A, McCourt C. Women's experiences of induction of labour: qualitative systematic review and thematic synthesis. Midwifery. 2019;69:17-28.
14. Kazi S, Naz U, Naz Sr U, Hira A, Habib A, Perveen F. Fetomaternal Outcome Among the Pregnant Women Subject to the Induction of Labor. Cureus. 2021;13(5):e15216.
15. Thangarajah F, Scheufen P, Kirn V, Mallmann P. Induction of Labour in Late and Postterm Pregnancies and

its Impact on Maternal and Neonatal Outcome. Geburtshilfe Frauenheilkd. 2016;76(7):793-798.
16. Botcha H, Agrawal S, Dora AK. The Fetomaternal Outcome in Pregnancy beyond 40 Weeks of Gestation at a Tertiary Center. J South Asian Feder Obst Gynae. 2023;15(3):278–282.
17. Kandalgaonkar VP, Kose V. Fetomaternal outcome in postdated pregnancy. Int J Reprod Contracept Obstet Gynecol. 2019;8(5):1899-1906.
18. Suliman AA, Abdelrahman GM, Ahmed HSI, Ibrahim AS, Hammad KMA, Omer EAS. Postdate Pregnancy Maternal and Fetal Outcomes among Sudanese Women. Clin J Obstet Gynecol. 2023;6(4):165-171.