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RESEARCH ARTICLE
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COMPARISON OF FETOMATERNAL OUTCOMES IN TERM PREGNANCIES BEFORE AND AFTER 40 WEEKS

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ABSTRACT

Background: Post-dated pregnancy, defined as gestation extending beyond 40 weeks, is associated with increased maternal and perinatal risks such as oligohydramnios, macrosomia, meconium aspiration, fetal distress, PPH (Post-Partum Haemorrhage), and elevated rates of operative delivery. This study compares fetomaternal outcomes between pregnancies before 40 weeks and those extending beyond 40 weeks in order to guide timely obstetric interventions.

Methods: A prospective cohort study was conducted at the Regional Institute of Medical Sciences, Imphal, from May 2023 to October 2024. A total of 106 adult pregnant women were enrolled and divided into two groups: post-dated pregnancies (>40 weeks) and term pregnancies (37–40 weeks), each comprising 53 participants. Women with medical disorders, prior cesarean section, congenital anomalies, malpresentation, and multifetal gestations were excluded. Data on maternal demographics, type of labor, induction method, mode of delivery, neonatal outcomes, and complications were recorded. Statistical analysis was performed using SPSS v26, with $p < 0.05$ considered significant.

Results: Post-dated pregnancies showed higher rates of induction (49% vs. 22.6%) and cesarean section (35.85% vs. 11.32%). Severe oligohydramnios (36.8%) and cephalopelvic disproportion (26.3%) were the leading indications for caesarean delivery in the >40-week group. Meconium-stained liquor was significantly more common in post-dated pregnancies (65.38% vs. 15.09%, $p < 0.05$). PPH occurred in 34% of post-dated women compared to 7.5% in controls ($p = 0.00185$). The mean birth weight was higher in the post-dated group (3.23 kg vs. 3.05 kg, $p = 0.018$). NICU admissions were significantly increased among post-dated neonates (14 vs. 4, $p = 0.01$), primarily due to meconium aspiration syndrome and birth asphyxia. Lower APGAR scores were more frequent in the post-dated group.

Conclusion: Pregnancies extending beyond 40 weeks are associated with significantly higher maternal and neonatal morbidity, particularly due to increased operative delivery, PPH, meconium

aspiration, and NICU admissions. Timely monitoring and induction around 40 weeks may help reduce adverse outcomes.

Keywords: Post-Dated Pregnancy, Term Pregnancy, Fetomaternal Outcome, NICU Admission, Meconium Aspiration, Cesarean Section, Postpartum Hemorrhage.

INTRODUCTION

At the onset of the SDGs (Sustainable Development Goals) era in 2016, preventable pregnancy-related morbidity and mortality remained unacceptably high.[1] Although considerable progress has been made, further improvements are essential, with emphasis not only on survival but also on optimising overall maternal and neonatal health. Every obstetrician aims to ensure a safe pregnancy culminating in the delivery of a healthy newborn while preserving maternal well-being.[2]

Pregnancy is considered full-term between 37 and 42 weeks, but when it continues beyond 40 weeks, it is termed post-dated, and beyond 42 weeks, post-term.[3] While some pregnancies naturally exceed 40 weeks without adverse events, prolonged gestation is associated with increased risks for both mother and fetus.[4,5] These include fetalmacrosomia, oligohydramnios, meconium aspiration, fetal distress, stillbirth, prolonged labor, higher cesarean section rates, PPH (Post-Partum Haemorrhage), and perineal trauma.[5] Placental insufficiency is a major concern, as it may compromise fetal oxygen and nutrient supply, contributing to these complications.[6]

Globally, 10–15% of pregnancies extend beyond 40 weeks.[7] Factors contributing to post-dated pregnancies include incorrect gestational dating, genetic predisposition, maternal obesity, primiparity, and delayed antenatal registration.[8] Accurate dating is crucial, as miscalculation is the most common cause of prolonged pregnancy.[9] Early-pregnancy ultrasonography improves EDD (Estimated Date of Delivery) accuracy, whereas traditional clinical criteria may overestimate gestational age.[9,10] Clinical presentation varies, ranging from asymptomatic cases to reduced fetal movements, meconium-stained liquor, or abnormal fetal heart rate patterns. Effective management includes close fetal surveillance using Doppler studies, NST (Non-Stress Tests), and judicious decisions regarding induction or cesarean delivery.[11] Evidence suggests that adverse outcomes begin to rise after 41 weeks, likely due to progressive placental insufficiency.[12]

Against this backdrop, the present study conducted at the Regional Institute of Medical Sciences, Imphal, compares fetomaternal outcomes between pregnancies extending beyond 40 weeks and those delivering between 37 and 40 weeks, evaluating parameters such as mode of delivery, cesarean indications, birth weight, NICU admissions, Apgar scores, postpartum complications, and meconium-stained amniotic fluid.

AIMS AND OBJECTIVES

The study aimed to evaluate and compare the maternal and fetal outcomes of uncomplicated singleton term pregnancies delivering before 40 weeks with those extending beyond 40 weeks. Specifically, it seeks to assess differences in mode of delivery, indications for cesarean section, birth weight, Apgar scores, NICU admissions, postpartum complications, and the incidence of meconium-stained amniotic fluid, thereby providing evidence to guide optimal management of prolonged pregnancies.

MATERIALS AND METHODS

Study Design

This prospective cohort study was conducted over 1.5 years, from 1st May 2023 to 31st October 2024, at the Departments of Obstetrics and Gynaecology and Paediatrics, Regional Institute of Medical Sciences (RIMS), Imphal, Manipur. It was a tertiary care hospital–based study involving adult pregnant women with uncomplicated singleton term pregnancies who attended antenatal clinics at RIMS and were subsequently admitted for delivery during the study period. The study compared maternal and fetal outcomes among those delivering before 40 weeks and those delivering beyond 40 weeks of gestation.

Inclusion and Exclusion Criteria

The study included adult pregnant women with uncomplicated singleton pregnancies in vertex presentation who were willing to participate and had regular menstrual cycles with a known last menstrual period or early ultrasonographic dating. Participants were divided into two groups: the study group comprised post-dated women with gestational age beyond 40 weeks, while the control group consisted of women with term pregnancies between 37 and 40 weeks. Women were excluded if they had a previous cesarean section, malpresentation, placenta previa, multifetal gestation, any known congenital anomaly, or medical complications such as diabetes, hypertension, heart disease, thyroid disorders, or preterm pregnancy.

Sample Size Calculation

The sample size was calculated using the formula

$$n\ (each\ group) = \frac{(p_0 q_0 + p_1 q_1)(z_{1-\alpha/2} + z_{1-\beta})^2}{(p_1 - p_0)^2}$$

- p_0 - proportion of the control group
- p_1 -the proportion of the study group
- q_0 - $(1\text{-}p^0)$
- q_1 - $(1\text{-}p^1)$
- $Z(1\text{-}\alpha/2)$ -confidence interval
- $Z(1\text{-}\beta)$ - power of the study

Taking the proportion of PPH into consideration**,**

Group-1: proportion of PPH in >40 weeks (study group): 33.3%

Group-2: proportion of PPH in 37-40 weeks (control group): 60.2%

(Data taken from a study conducted by Fukami T, Koga H, and Goto M)[13]

Power: 80%

Error: 5%

Applying the above values in the formula, the total sample size calculated was 106, which was divided into

Group- 1 (study group): 53

Group -2 (control group): 53

Data Collection Procedure

Data collection was initiated after obtaining ethical clearance from the Institutional Ethical Committee, RIMS, Imphal, and written informed consent from all willing participants. Eligible women were screened according to the inclusion and exclusion criteria, and detailed information was recorded in a predesigned proforma. This included demographic details, antenatal booking status, medical history, and possible causes of post-dated pregnancy. A comprehensive clinical evaluation-covering general, systemic, abdominal, and pelvic examinations—was performed, followed by routine investigations such as complete hemogram, blood grouping and Rh typing, coagulation profile, thyroid, liver and kidney function tests, blood sugar levels, VDRL, hepatitis B and C, HIV screening, and urine analysis. Maternal and neonatal outcomes, including mode of delivery, complications, fetal status, and NICU admissions, were documented at appropriate stages during the course of pregnancy and delivery.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using SPSS Statistics software version 26 (IBM SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to summarize demographic variables and clinical characteristics. Categorical variables were analyzed using the chi-square test, while continuous variables were compared using the Independent T-test. A p-value of <0.05 was considered statistically significant for all analyses.

RESULTS

Variable	Category	Study Group n (%)	Control Group n (%)
Age	15–19	2 (3.77%)	0 (0%)
	20–24	22 (41.51%)	12 (22.64%)
	25–29	19 (35.85%)	26 (49.06%)
	30–34	6 (11.32%)	12 (22.64%)
	35–39	4 (7.55%)	3 (5.66%)
Socioeconomic (Residence)	Rural	37 (69.81%)	23 (43.40%)
	Urban	16 (30.19%)	30 (56.60%)
Religion	Hindu	31	42
	Muslim	17	7
	Christian	5	4
Table 1: Demographic Characteristics (Age, Socio-Economic Status, Religion)			

Table 1 shows that post-dated pregnancies were more common among younger women (20–24 years) and predominantly from rural backgrounds, whereas the control group had more urban participants.

Variable	Category	Study n (%)	Control n (%)
Gravida	G1	26 (49.06%)	11 (20.75%)
	G2	15 (28.30%)	14 (26.42%)
	G3	5 (9.43%)	20 (37.74%)
	G4	5 (9.43%)	8 (15.09%)
	G5	2 (3.77%)	0 (0%)
Parity	P0	30 (56.6%)	14 (26.42%)
	P1	12 (22.64%)	20 (37.74%)
	P2	6 (11.32%)	15 (28.30%)
	P3+	5 (9.43%)	4 (7.55%)
Gestational Age	40–40+6 w	36 (67.92%)	—
	41–41+6 w	14 (26.42%)	—
	>42 w	3 (5.66%)	—
	37–37+6 w	—	1 (1.9%)
	38–38+6 w	—	27 (50.9%)
	39–39+6 w	—	25 (47.2%)
Table 2: Obstetric Profile (Gravida, Parity, Gestational Age)			

Table 2 illustrates that post-dated pregnancies occurred mainly in primigravida and nulliparous women**,** with two-thirds delivering between 40 and 40+6 weeks**.**

Variable	Category	Study Group n (%)	Control Group n (%)
Type of Labor	Spontaneous	51%	77.36%
	Induced	49%	22.64%
Induction Method	Misoprostol	18 (33.96%)	9 (16.98%)
	Dinoprostone gel	9 (16.98%)	3 (5.66%)
Table 3: Labor Characteristics (Type of Labor & Induction Method)			

Table 3 shows that induction was nearly twice as common in post-dated pregnancies, with misoprostol being the most widely used induction agent.

Variable	Category	Study n (%)	Control n (%)
Mode of Delivery	Vaginal	49.06%	88.68%
	LSCS	35.85%	11.32%
	Ventouse	15.09%	0%
Indications for LSCS	Oligohydramnios	7 (36.8%)	0
	CPD	5 (26.3%)	1 (16.7%)
	Failed induction	3 (15.8%)	0
	Acute fetal distress	2 (10.5%)	2 (33.3%)
	Non-progress of labor	2 (10.5%)	3 (50.0%)
Table 4: Mode of Delivery & Indications for LSCS			

Table 4 demonstrates a markedly higher LSCS rate in post-dated pregnancies, mainly due to oligohydramnios and CPD**,** whereas the control group underwent LSCS mostly for non-progress of labor.

Complication	Study Group n (%)	Control Group n (%)
PPH	18 (34%)	4 (7.5%)
Meconium-Stained Liquor	65.38%	15.09%
Table 5: Maternal Complications (PPH & Meconium-Stained Liquor)		

Table 5 reveals that PPH and meconium-stained liquor were significantly more common in post-dated pregnancies, indicating poorer intrapartum conditions.

Variable	Category	Study Group	Control Group
Mean Birth Weight	—	3.23 kg	3.05 kg
APGAR at Birth	7	7	1
	8	22	6
	9	23	46
Table 6: Neonatal Parameters (Birth Weight & APGAR Score)			

Table 6 shows that post-dated pregnancies had higher birth weights but a greater proportion of low APGAR scores (≤7).

Variable	Category	Study Group	Control Group
NICU Admissions	Total admitted	14	4
Indications	Meconium Aspiration Syndrome	10 (71.43%)	3 (75%)
	Birth Asphyxia	4 (28.57%)	1 (25%)
Table 7: NICU Admissions & Indications			

Table 7 illustrates that NICU admissions were significantly higher in post-dated babies, mostly due to MAS and birth asphyxia**.**

DISCUSSION

In the present study, post-dated pregnancies demonstrated a clear association with increased fetomaternal morbidity when compared to term pregnancies, consistent with previously published literature. The predominance of primigravida among post-dated women aligns with several studies, including Sonaliet al.[14]and Sinha et al.[15] who also reported a higher incidence of prolonged pregnancy in primigravida. This pattern may be attributed to physiological and cervical factors that delay the onset of spontaneous labor.

A significantly higher proportion of women in the post-dated group required induction of labor in the current study, similar to the findings of Sonali et al.[14] and Chaudhari et al.[16] who reported increased

induction rates in pregnancies exceeding 40 weeks. Misoprostol was the most frequently used induction agent in our cohort, which is consistent with its widespread use in other studies such as Rajendran and Parikh[17] and Pipaliya et al.[18]. Increased induction rates in prolonged pregnancies may reflect concerns over placental insufficiency, reduced amniotic fluid, and fetal compromise.

Cesarean delivery was significantly more common among post-dated pregnancies, comparable with findings from Singh et al.[19] Kumar et al.[20] and Nimbargi et al.[21] In our study, the principal indications for cesarean section were oligohydramnios, cephalopelvic disproportion, and failed induction-all recognized consequences of advancing gestational age. Similar indications were reported by Dobariya et al.[22] Daisy et al.[23] and Joshi et al.[24] The increased LSCS rate in post-dated pregnancies is also attributed to fetalmacrosomia and non-reassuring fetal status, which have been widely described in prior literature.[20]

The incidence of meconium-stained amniotic fluid was significantly higher beyond 40 weeks in our study, supporting earlier reports from Usher et al.[25] Hovi et al.[26] and Mehrnoush et al.[27] who identified increasing MSL rates as gestation extends. This rise reflects the higher likelihood of fetal distress, placental aging, and decreased amniotic fluid volume seen in prolonged pregnancies.

Neonatal outcomes in our study further reinforce these associations. A higher proportion of neonates with low Apgar scores and increased NICU admissions was observed in the post-dated group. These results are consistent with those of Sinha et al.[15] Singh et al.[19] and Daisy et al.[23] who reported increased asphyxia, respiratory distress, and meconium aspiration in prolonged pregnancies. MAS was the leading cause of NICU admission in our cohort, matching observations by Farhat et al.[28] and Sarmah et al.[29]

Birth weight was significantly higher in post-dated pregnancies in our study, reflecting the well-established link between prolonged gestation and fetalmacrosomia. Similar findings have been documented by Kumar et al.[20] Mehrnoush et al.[27] and Marahatta et al.[30] Macrosomia contributes to complications such as shoulder dystocia, obstructed labor, and operative interventions, as observed by Nishar.[31]

Among maternal outcomes, postpartum hemorrhage was significantly more frequent in the post-dated group, aligning with studies by Bishnoi et al.[32] Chaudhari et al.[16] and Gandotra and Gupta.[33] Uterine atony, prolonged labor, and operative deliveries likely contributed to the increased PPH incidence.

Overall, the findings of the present study strongly support existing evidence that pregnancies extending beyond 40 weeks are at significantly higher risk for adverse fetomaternal outcomes. As recommended by multiple authors, including Rajaniet al.[34] Pipaliya et al.[18] timely induction-preferably around 40 to 41 weeks-and close fetal surveillance are essential in reducing perinatal morbidity and preventing preventable complications. The present study reinforces the need for accurate gestational dating, early identification of risk factors, and vigilant monitoring to ensure optimal outcomes in post-dated pregnancies.

CONCLUSION

Post-dated pregnancy, defined as gestation beyond 40 weeks, is associated with increased maternal and fetal risks, including higher rates of obstetric interventions, antepartum and intrapartum complications, and NICU admissions. This study demonstrates that prolonged pregnancies require classification as high-risk and should be managed with vigilant monitoring, early identification of complications, and timely intervention. With appropriate care, many adverse outcomes can be prevented. Given the elevated risks observed, induction of labor after 41 weeks appears beneficial in reducing complications and improving overall maternal and neonatal outcomes.

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