

The Fetomaternal Outcome in Pregnancy beyond 40 Weeks of Gestation at a Tertiary Center

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ABSTRACT

Aims and background: Any pregnancy duration extending beyond 294 days is prolonged. These pregnancies do have higher chances of complications. Pregnancies beyond 40 weeks or 280 days are also associated with compromised fetomaternal outcomes. This study aims to evaluate the fetomaternal outcome in pregnancies after 40 weeks of gestation.

Materials and methods: In this prospective observational study of 14 months duration, both primigravida and multigravida crossing 40 weeks of pregnancy were included. Complicated pregnancies and fetal anomalies were excluded. The spontaneous labor or induction rate, mode of delivery, and fetomaternal complications were evaluated. The statistical analysis was done using SPSS software.

Results: Most primigravidas needed induction of labor compared to multigravida. The induced group had higher cesarean section rates, 59.37%, than the spontaneous group, 19.44%, which is statistically significant. Maternal morbidities at <40 weeks pregnancies are found in 16.58% of cases and 29.6% of cases between 41 and 42 weeks. Perinatal morbidity is seen in 35.7% of pregnancies in less than 41 weeks and 100% of cases crossing 42 weeks.

Conclusion: Pregnancies beyond 40 weeks are associated with higher complication rates, which increase as gestational age (GA) increases.

Clinical significance: All pregnancies beyond 40 weeks should be categorized as high risk and monitored intensively.

Keywords: Beyond 40 weeks of pregnancy, Postdatism, Post-dated pregnancy, Post-term pregnancy, Prolonged pregnancy.

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INTRODUCTION

Pregnancy crossing 40 weeks of gestation is one of the most frequent clinical dilemmas obstetricians face. The definition of post-term pregnancy exceeds 42^{0/7} weeks from the first day of the last menstrual period (LMP).¹

Ratnam et al. reported that the incidence of prolonged pregnancy is 3–14% of all pregnancies.² Hereditary, high standard of living, sedentary habits, fetal anomalies like anencephaly, and elderly pregnancy are factors related to prolonged pregnancy. There is a chance of 50% recurrence if there is a history of post-term pregnancy.³ Fetomaternal morbidity and mortality also increase when any pregnancy crosses beyond the expected date of delivery (EDD). National Birthday Trust Data from Britain revealed that there is an increase in perinatal mortality rate after 42 weeks gestation, which doubles at 43 weeks and increases four times at 44 weeks of pregnancy.^{4,5}

As reported by Ratnam et al., mortality rate is higher in these post-term infants up to two years of age.² So consideration for termination of pregnancy should be done beyond 41 weeks, once the maturity of the fetus is confirmed by history, examination, and investigations. The induction of labor may avoid fetomaternal complications. Maternal complications like oligohydramnios, operative delivery, meconium-stained amniotic fluid, and fetal complications like low Apgar score, neonatal intensive care unit (NICU) admission, meconium aspiration syndrome (MAS), and neonatal deaths are associated with prolonged pregnancy.

The present study is conducted to assess and quantify the effect of pregnancy beyond 40 weeks on the mode of delivery and fetomaternal outcome.

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MATERIALS AND METHODS

Source of Data

Both the primigravida and multigravida who have crossed 40 weeks of gestation were checked for the fulfilment of inclusion and exclusion criteria. After their consent, they were enrolled in the study. They were admitted to the Department of Obstetrics and Gynaecology, Jawaharlal Nehru Hospital and Research Centre. The study was conducted for a period of 14 months.

This study was done to evaluate the following:

- Incidence of spontaneous labor and induction of labor.
- Incidence of cesarean section and its indications.
- Incidence of oligohydramnios.
- Incidence of various fetomaternal morbidities.

Study Design

Prospective observational study.

Sample Size Calculation

P = Proportion of perinatal deaths in post-dated pregnancies from the previous study = 3% = 0.03⁶

$Q = 1 - P = 1 - 0.03 = 0.97$

1.96 = Z value for 5% confidence interval

e = Precision = 0.05

$$n = \frac{1.96^2 \times p \times q}{e^2}$$

$$n = \frac{1.96^2 \times 0.03 \times 0.97}{0.05^2} = 44.71$$

We have taken a sample size of 100.

Descriptive analysis was done using percentage, mean, and standard deviation. The unpaired t test was used to analyze continuous variables. The Chi-square test or Fisher's exact test was used to analyze categorical variables.

STUDY SUBJECTS

Inclusion Criteria

- Pregnant women beyond 40 weeks of gestation. Both primigravida and multigravida were included. Gestational age (GA) was confirmed by the first trimester ultrasonography report.
- Cephalic presentation.
- Singleton pregnancy.

Exclusion Criteria

- Any associated complications like previous lower segment cesarean section (LSCS), malpresentation, hypertensive diseases of pregnancy, gestational diabetes or overt diabetes, placental abruption or previa, anemia, and other medical disorders of pregnancy.
- Anomalies of the fetus.

METHODOLOGY

Total 100 cases coming to the labor room through outpatient department (OPD) or emergency who are willing to be enrolled in the study were included after considering the inclusion and exclusion criteria.

Prolonged pregnancy confirmed by history, physical examination, and investigations. The obstetric examination was done with particular emphasis on detecting any signs of fetal growth abnormality and oligohydramnios. A vaginal examination was done to assess the bishop score and the adequacy of the pelvis. Non-stress test was done to find any signs of fetal compromise, and ultrasonography was done to detect amniotic fluid index (AFI) and any Doppler abnormality.

Fetomaternal morbidity and mortality were recorded by following the patients up to seven days after delivery.

For the sake of comparison, two groups were created.

Group A patients were with prolonged pregnancy with spontaneous onset of labor.

Group B patients were with prolonged pregnancy but not in labor.

In group A patients maternal pulse rate, blood pressure (BP), uterine activity, and fetal heart rate monitoring were done. Artificial rupture of the membrane was done at cervical dilatation of 3–4 cm to rule out meconium. The duration of the stages of labor was

Table 1: Case distribution into spontaneous and induced group according to the parity

Parity	Induced	Spontaneous	Total
Primigravida	52 (70.28%)	22 (29.72%)	74
2nd Gravida	6 (42.86%)	8 (57.14%)	14
3rd Gravida	6 (54.55%)	5 (45.45%)	11
>3rd Gravida	(0%)	1 (100%)	1
Total	64 (63.00%)	36 (37.00%)	100

Table 2: Case distribution according to gestational age vs AFI

GA at LMP (weeks)	AFI			Total, N (%)
	< 5	5–8	> 8	
< 41	2 (2.38%)	9 (10.71%)	73 (85.71)	84 (100%)
41–42	3 (21.42%)	7 (50%)	4 (28.57%)	14 (100%)
> 42	2 (100%)	–	–	2 (100%)
Total	7 (7%)	16 (16%)	76 (76%)	100 (100%)
Significance	$p < 0.0001$			

Table 3: Mode of delivery in induced and spontaneous groups

	Normal vaginal	LSCS	Outlet forceps
Induced	21 (32.8%)	28 (59.37%)	5 (7.81%)
Spontaneous	28 (77.77%)	7 (19.44%)	1 (2.77%)
p -value	0.0013		

recorded. In group B patients, maternal pulse rate, BP, uterine activity, and fetal heart monitoring were also done, and intracervical 0.5 mg dinoprostone (PGE2) gel was applied. Artificial rupture of the membrane was done at cervical dilatation of 3–4 cm to rule out meconium.

Intrapartum monitoring was done using cardiotocography, and partogram were also plotted in both groups. The progress of labor, signs of fetal distress, meconium-stained liquor, and duration of stages of labor were recorded. The mode of delivery was noted.

Any complications during delivery, GA at delivery, date and time of birth, sex, Apgar score, birth weight, neonatal complications, and NICU admissions were noted. The status of both fetus and mother at the end of 7 days was noted. The above data were entered in a pro forma and analyzed in the SPSS software.

RESULTS

The majority of primigravida needed induction of labor, that is, 70.28%. The majority of multigravida underwent spontaneous labor (Table 1), that is, 53.8%.

As evident in Table 2, as GA advances, AFI decreases, and it is statistically significant ($p < 0.0001$).

The induced group had high cesarean section rates compared with the spontaneous group, which is statistically significant (Tables 3 and 4).

Fetal distress was the commonest indication for cesarean section, that is, 62.23%, followed by failed induction 20% in pregnancies beyond 40 weeks (Table 5).

As GA increases, maternal morbidity increases. Maternal morbidities at <40 weeks pregnancies were found in 16.58% of cases and 29.6% of cases between 41 and 42 weeks. Postpartum hemorrhage was the commonest morbidity.

As GA advances, perinatal morbidity increases. Perinatal morbidity at <41 weeks gestation was seen in 35.7% of cases and beyond 42 weeks in 100% of cases (Table 6).

DISCUSSION

Most of our study population, that is, 85%, were between 20 and 30 years of age. The mean age of participants was 26.53 years in our study. Singh et al.⁷ study reported that 83.4% of cases were between 20 and 30 years of age which is comparable to our study. The mean age of patients in a study of Mahapatro and Samal⁸ was 24 years, which is close to our study.

Prolonged pregnancy occurred more frequently in primigravida, that is, 74%, than in multigravida, that is, 26%. In a study by Mahapatro and Samal, the incidence of postdated pregnancy in primigravida was 71%, comparable to ours.⁸

In our study population at 40–41 weeks of gestation, 63.1% were induced, and 36.9% underwent spontaneous labor. At 41–42 weeks of gestation, 64.28% were induced and 35.72% had spontaneous labor. At >42 weeks of gestation, 100% were induced. As the GA advances, induction rate also increases. Bhriegu et al.⁹ reported that at 40–41 weeks, 38.6% were induced, 61.40% underwent spontaneous labor, at 41–42 weeks 71.43% were induced and 28.57% underwent spontaneous labor. As the GA advances induction rate also increases, similar to our study. As stated in a study of Mala Galal et al., “When the ongoing risk of stillbirth is weighted against the very low risk of failed induction, it is suggested that elective IOL may be a reasonable option for

such women at 39–41 weeks of gestation.”¹⁰ In a study of Caughey et al., it was stated that “it is a common practice to offer IOL at 41–42 weeks of gestation because it seems that the benefits outweigh the risks of IOL in such patients.”¹¹

As the GA advances, the incidence of oligohydramnios increases. In our study, at 40–41 weeks, the incidence of oligohydramnios was 2.38%, at 41–42 weeks of gestation, it was 21.42%, and at > 42 weeks, it was 100%. A statistically highly significant correlation was found between GA and AFI. In a study of Morris et al.,¹² the prevalence of oligohydramnios was 7.98%, comparable to ours. In a longitudinal study of the AFI in the post-dated pregnancy by Marks and Divon oligohydramnios was found in 11.5% of the study population.¹³ A study by Mahapatro et al. reported the prevalence of oligohydramnios at 21.89%.⁸ In a study by Harwal and Melkundi, the incidence of oligohydramnios was 31%.¹⁴ According to this study, as the GA increased, the incidence of oligohydramnios also increased, which supports our study.

In our study population, the normal vaginal delivery rate in the induction of labor group was 33% and the LSCS rate was 59.37%. The spontaneous group had a normal vaginal delivery rate of 77% and the LSCS rate was 19.44%.

Mahapatro et al.’s study reported that the rate of LSCS was more (36.31%) in the induced group compared with the spontaneous group (21.39%), which is comparable to our study.⁸

In our study population, fetal distress was the commonest indication for LSCS 62.33%, followed by failed induction 20%, nonprogression of labor at 13.33%.

In a Dobariya et al.’s study, indications for LSCS were fetal distress 48% and nonprogress of labor (NPOL) 23%.¹⁵ In the study of Hemalatha et al., fetal distress was the commonest indication for LSCS at 30.6%, which is similar to our study.¹⁶

In the present study, the overall incidence of PPH was 6%; at 40–41 weeks of gestation, it was 5.9%, and at 42 weeks of gestation, it increased to 7.1%. The incidence of fever at 40–41 weeks was 4.76% which was increased to 7.4% at 41–42 weeks of gestation. Similar trend of increased maternal morbidity with increased GA was also found with other morbidities.

In Dobariya et al.’s study incidence of maternal complications in post-dated pregnancy was PPH 5.95%, fever 3.57%, comparable

Table 4: Indications of cesarean section

Indication for LSCS	Primigravida	Multigravida	Total
Fetal distress	21 (61.77%)	7 (63.64%)	28 (62.23%)
Failed induction	7 (20.59%)	2 (18.18%)	9 (20.00%)
Nonprogress of labor	4 (11.76%)	2 (18.18%)	6 (13.33%)
Cephalopelvic disproportion	2 (5.88%)	0 (0%)	2 (4.44%)
Total	34 (100%)	11 (100%)	45 (100%)

Table 5: Maternal morbidity at various gestational age

GA	Maternal morbidity						Total N (%)
	Episiotomy wound extension	Postpartum hemorrhage	Fever	Wound infection	Cervical tear	Perineal tear	
<41 weeks	1 (1.19%)	5 (5.95%)	4 (4.76%)	2 (2.3%)	1 (1.19%)	1 (1.19%)	84 (100%)
41–42 weeks	–	1 (7.4%)	1 (7.4%)	1 (7.4%)	1 (7.4%)	0	14 (100%)
>42 weeks	–	–	–	–	–	–	2 (100%)
Total	1 (1%)	6 (6%)	5 (5%)	3 (3%)	2 (2%)	1 (1%)	100 (100%)

Table 6: Distribution of cases according to perinatal outcomes

GA	Perinatal morbidity						Total N (%)
	MSL	MAS	TTN	RDS	Neonatal jaundice	Neonatal convulsions	
<41 weeks	16 (19.04%)	–	4 (7.14%)	3 (3.57%)	3 (3.57%)	1 (2.38%)	84 (100%)
41–42 weeks	5 (35.71%)	3 (21.42%)	2 (14.28%)	1 (7.14%)	1 (7.14%)	–	14 (100%)
>42 weeks	–	2 (100%)	–	–	–	–	2 (100%)
Total	21 (22%)	5(5%)	6 (6%)	4 (4%)	4 (4%)	1 (1%)	100 (100%)

MAS, meconium aspiration syndrome; MSL, meconium stained liquor; RDS, respiratory distress syndrome; TTN, transient tachypnea of the newborn



to our study.¹⁵ In Kana Odedara et al.'s study, the PPH was the commonest complication.¹⁷

In our study population, incidence of meconium-stained liquor was 26%. The incidence of MAS was 5%. The incidence of respiratory distress syndrome (RDS) was 4% and incidence of transient tachypnea of newborn was 6%.

As the GA advances, perinatal complications also increase. In the Dobariya et al. study, the incidence of MAS was 7.14%, and RDS was 3.57% which is comparable to our study.¹⁵ In the Hemalatha and Priya Shankar study, the incidence of MAS was 5.9%.¹⁶ In Verma et al.'s study, the incidence of MAS was 6.41%.¹⁸ In the Mahapatro and Samal study, the incidence of MAS was 8.57% and RDS was 11.42%.⁸ In post-term pregnancies and pregnancy that crosses 41 weeks gestation, the perinatal morbidity increases. This includes MAS, meconium-stained liquor, and large for date fetus.

As described in the study of Caughey et al., some complications, like stillbirth, neonatal acidemia, and passage of meconium, are greater at 41 and even at 40 weeks of gestation in comparison to 39 weeks gestation.¹¹

From the findings of our study and many other studies, it is derived that the incidence of LSCS, and maternal and neonatal morbidity increased as the pregnancy crosses beyond 40 weeks. Although the definition of post-term pregnancy exceeds 42^{0/7} weeks from LMP, the pregnancy and delivery complication increase once it crosses 40 weeks.

The strength of our study is that we have excluded the high-risk pregnancies; otherwise, that would have influenced the outcome. The limitation is the short duration of follow-up.

CONCLUSION

The dating scan is recommended in all antenatal patients, particularly those with irregular cycles, to estimate GA and EDD.

Induction of labor should be allowed in properly selected prolonged pregnancies with informed counseling regarding the chance of failure and maternal and fetal complications. These patients should be monitored intensively.

Ultrasonography should be done in all prolonged pregnancies to detect oligohydramnios before induction.

Partographic management and electronic fetal monitoring should be done to detect any abnormalities. Early artificial rupture of membrane (ARM) at 3–4 cm should be done to rule out meconium-stained liquor.

Prolonged pregnancy should not be the sole indication for cesarean section. Patients with other obstetric indications may be taken for cesarean section.

Maternal and neonatal complications are not limited to pregnancy beyond 42 weeks, but also seen in 40–42 weeks of gestation. So, all pregnancies beyond 40 weeks should be taken under special care pregnancy.

All prolonged pregnancy cases should be monitored and managed in a tertiary care center with a facility for electronic fetal monitoring, round the clock availability of emergency obstetric care. Particularly trained obstetricians should be available for the conductance of instrumental deliveries and emergency cesarean sections along with an anesthetist and a good NICU.

Further research is needed with a larger sample size and a prolonged follow-up. The inclusion of high-risk pregnancies in the

study may give a more comprehensive outcome, which will help in the proper management of high-risk prolonged pregnancies and will guide for the labor induction at a suitable GA.

Clinical Significance

The present and related studies found that pregnancy beyond 40 weeks is associated with more fetomaternal complications. These pregnancies should be monitored intensively and induction may be planned accordingly.

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