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Original Research Article

Study of maternal and fetal outcome in pregnancy beyond 40 weeks: a prospective observational study at a tertiary institute

Shreedevi Kori^{1*}, Dayanand Biradar², Aruna Biradar¹, Rajasri Yaliwal¹,
Subhashchandra R. Mudanur¹, Neelamma Patil¹, Shivakumar Pujeri¹

¹Department of Obstetrics and Gynecology, Shri BM Patil Medical College Hospital and Research Center, Deemed to be University, Vijayapura, Karnataka, India

²Department of General Surgery, Shri BM Patil Medical College Hospital and Research Center, Deemed to be University, Vijayapura, Karnataka, India

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*Correspondence:

Dr. Shreedevi Kori,

E-mail: shreedevi.kori@bldedu.ac.in

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ABSTRACT

Background: Prolonged pregnancy is one that exceeds 42 0/7 weeks. Management of prolonged pregnancy is very challenging in modern obstetrics.

Methods: It is prospective observational study in department of Obstetrics and Gynecology, Shri B.M Patil medical college and Research center, deemed to be University, Vijayapur, North karnataka. Study period was from January 2018 to January 2019.

Results: Total of 186 pregnant women were included in the study. Results in terms of age, gravidity, gestational age, time of induction, mode of delivery, neonatal outcome and maternal complications.

Conclusion: Pregnancies beyond 40 weeks require early detection, effective fetal monitoring and proper planning of labour. In pregnancies beyond 40 weeks, decision of induction should be taken cautiously as early induction leads to failure of induction and increased rates of lower (uterine) segment Caesarean section (LSCS), while delayed induction leads to increased fetal complications.

Keywords: Late term pregnancy, Post term pregnancy, Fetomaternal complications, Induction of labour, Caesarean section

INTRODUCTION

The internationally accepted definition of prolonged pregnancy, is one that exceeds 42 0/7 weeks, namely, 294 days or more from the first day of the last menstrual period.¹ The prevalence of prolonged pregnancy across the world varies from 3-12%.² Factors that influence the prevalence are maternal age, primiparous women population, incidence of preterm birth, interventions induction of labour/caesarean section and routine ultrasound dating of pregnancy, antenatal health surveillance and accuracy of gestational age estimation.³ Risk factors for post term birth include: primiparity, advanced maternal age, maternal obesity,

heredity, previous post term pregnancy, and a male fetus.^{4,5} Though risk of perinatal complications such as meconium aspiration syndrome (MAS), umbilical cord complications, asphyxia, pneumonia, sepsis, convulsions, shoulder dystocia, traumatic injuries and peripheral nerve damage is higher in post term deliveries than in deliveries at term.⁶

Management plan in patients with pregnancy beyond 40 weeks is controversial, more so with routine use of sonography providing information about amount of amniotic fluid, placental aging and fetal weight. Induction of labour is generally undertaken to reduce maternal and fetal morbidity or mortality i.e. when the

risks of continuing the pregnancy to either mother or fetus are considered greater than the risks associated with planned birth.⁷ Both clinicians and patients are concerned about the risks of induction of labour such as uterine hyper-stimulation, failure of induction and increased in caesarean section rates.⁶

Pregnancies beyond 40 weeks are also associated with increased financial costs due to antenatal monitoring, induction of labour and a source of significant anxiety for the pregnant woman.⁸ While deciding management plan for postdate pregnancy (more than 40 weeks but less than 42 weeks), the first dilemma is whether to deliver patient and, if so, when and by what route. If one decides for expectant management, still there is confusion for method of antepartum fetal surveillance. Present study was undertaken to study maternal and fetal outcome in pregnancies beyond 40 weeks at our tertiary center.

METHODS

Present study is prospective observational study in department of Obstetrics and Gynecology, Shri B. M. Patil medical college and Research center, deemed to be University, Vijayapur, North Karnataka. Study period was from January 2018 to January 2019 (one year). Institutional ethical committee approval was obtained for present study.

Inclusion criteria

Women with pregnancy with completed 40 weeks of gestation (confirmed by dates or ultrasound findings), maternal age between 18-35 years, singleton, live pregnancy, cephalic presentation, willing to participate in study and follow up were included in the study.

Exclusion criteria

Patients with unknown dates, irregular menstrual period, medical complications as gestational diabetes, anemia, hypertensive disorders of pregnancy, heart disease, malpresentations, antepartum hemorrhage, previous caesarean section, chorioamnionitis, multiple pregnancy, fetal Congenital anomaly were excluded from the study.

Patients admitted in our labour room with more than 40 weeks gestation were considered for present study. A written informed consent was taken for participation in present study. On admission demographic data, general history including medical and obstetric history was taken, followed by general, systemic and obstetric examination.

If patient had spontaneous onset of labor at time of examination, then labour was monitored and necessary augmentation done accordingly. For patients who were not in labour with 40 completed weeks, depending on clinical presentation, obstetric conditions decision of mode of delivery and labour induction was taken. Labor

was monitored closely. Patients with CPD, acute fetal jeopardy were considered for LSCS. Agent of labour induction was as per choice of consultant obstetrician. In our institute we wait for spontaneous labour till 41 weeks.

Parameters noted were mode of delivery, any operative interference, maternal morbidity such as PPH, 4th degree perineal tear, perinatal morbidity by low APGAR score, meconium aspiration syndrome, neonatal intensive care unit (NICU) admission and mortality if any. Maternal and neonatal follow up kept till 7 days after delivery. All maternal and neonatal details were noted in a predesigned proforma.

The qualitative data was expressed in percentages and quantitative data expressed as mean±standard deviation. Student's t test and Chi-square test were used to determine statistical difference between variables. Statistical software (SPSS version 24) was used for analysis. Statistical tests were considered significant if $p < 0.05$.

RESULTS

After applying inclusion and exclusion criteria of study, total 186 pregnant women were taken into consideration and pregnancy outcomes assessed. Pregnancies were distributed as per recommendations from Spong CY.⁹ Out of total 186 pregnancies, 53% were full term (40 0/7 to 40 6/7 weeks), 35% were late term and 12% were post-term (Table 1).

Table 1: Classification of pregnancies.

Term pregnancy	Period of gestation (weeks)
Early term	37 0/7-38 6/7
Full term	39 0/7-40 6/7
Late term	41 0/7-41 6/7
Post-term	42 0/7 and beyond

Most common age group in present study was 21-25 years (45%), followed by age group 26-30 years (23%) and 31-35 years (16%). Similar results were noted in all three subgroups i.e. full term, late term and post-term pregnancies (Table 2).

Primigravida patients (62%) were more than second gravida (31%) and third or more gravida (8%) patients. Primigravida patients were significant in all groups (Table 3).

In present study 53% patients had spontaneous onset of labour, while in remaining 47% patient's decision was taken regarding mode of delivery. 10% patients advised elective LSCS while remaining 38% underwent induction of labour. Induction of labour was significant in late-term ($p < 0.05$) and in post-term ($p < 0.05$) pregnancies (Table 4).

Table 2: Age wise distribution.

Age (years)	Gestational age (weeks)			Total (%)
	Full term (%)	Late term (%)	Post-term (%)	
19-20	9 (5)	2 (1)	1 (1)	12 (6)
21-25	43 (23)	31 (17)	10 (5)	84 (45)
26-30	20 (11)	16 (9)	6 (3)	42 (23)
31-35	16 (9)	10 (5)	4 (2)	30 (16)
>35	11 (6)	6 (3)	1 (1)	18 (10)
Total	99 (53)	65 (35)	22 (12)	

Table 3: According to gravida status.

Gravida status	Gestational age (weeks)			Total (%)
	Full term (%)	Late term (%)	Post term (%)	
Primigravida	59 (32)	42 (23)	14 (8)	115 (62)
Second gravid	32 (17)	19 (10)	6 (3)	57 (31)
Third and more gravida	8 (4)	4 (2)	2 (1)	14 (8)

P value 0.0230.

Table 4: Correlation with decision of induction of labour.

Gestational age (weeks)	Induced labour (n=70) (%)	Spontaneous labour (n=98) (%)	Elective LSCS (n=18) (%)	Total (%)
Full term (n=99)	31 (31)	61 (62)	7 (7)	99 (53)
Late term (n=65)	31 (48)	26 (40)	8 (12)	65 (35)
Post-term (n=22)	8 (36)	11 (50)	3 (14)	22 (12)
Total	70 (38)	98 (53)	18 (10)	186

Chi square 4.342, p value 0.0291.

Table 5: According to mode of delivery.

Mode of delivery	Gestational age (weeks)			Total (n=186) (%)
	Full term (n=99) (%)	Late term (n=65) (%)	Post-term (n=22) (%)	
Vaginal delivery (spontaneous or induced)	58 (59)	36 (55)	11 (50)	105 (56)
Spontaneous vaginal delivery	39 (39)	21 (32)	4 (18)	64 (34)
Induced vaginal delivery	19 (19)	15 (23)	7 (32)	41 (22)
LSCS	29 (29)	22 (34)	9 (41)	60 (32)
LSCS-elective	7 (7)	8 (12)	3 (14)	18 (10)
LSCS-emergency	22 (22)	14 (22)	6 (27)	42 (23)
Instrumental delivery	12 (12)	7 (11)	2 (9)	21 (11)

Chi square 3.8710, p value 0.0491.

In present study 56% patients delivered vaginally, 32% had LSCS and 11% had instrumental delivery. Spontaneous vaginal delivery was noted in total 34% patients while 10% underwent elective LSCS. Rising trend was noted in incidence of LSCS in all groups along with increase in gestational age (Table 5).

Intravaginal Dinoprostone gel with intracervical insertion of Foley's catheter was most common method of induction (61%). Other methods used in present study were dinoprostone gel alone (20%), foley's catheter alone (11%) and 25mcg misoprostol (7 %) (Table 6).

In LSCS cases, most common indication was fetal distress overall (40%) and in each group of full term

(38%), late term (36%) and post-term (56%) pregnancies. Cephalopelvic disproportion (13%), Non-progress of labor (12%), prolonged PROM (10%) and absent liquor (10%) were other common indications for LSCS in pregnancies beyond 40 weeks. A significant incidence of fetal distress was noted in all groups ($p < 0.05$) (Table 7).

Post-partum hemorrhage (10%) was most common maternal complication noted in present study. 10 % patients required Blood transfusion. Other maternal complications were cervical tear (4%), 4th degree perineal tear (3%) and surgical site infection (3%). No near miss maternal mortality or maternal mortality noted in present study (Table 8).

Table 6: According to type of induction.

Type of induction	Gestational age (weeks)			Total (%)
	Full term (n=31) (%)	Late term (n=31) (%)	Post-term (n=8) (%)	
Dinoprostone gel + Foley's catheter	16 (52)	21 (68)	6 (75)	43 (61)
Dinoprostone gel	9 (29)	3 (10)	2 (25)	14 (20)
Foley's catheter	6 (19)	2 (6)	0	8 (11)
Misoprostol (25mcg)	0	5 (16)	0	5 (7)

Table 7: Indications of cesarean section.

Mode of delivery	Gestational Age (Weeks)			Total (%)
	Full term (n=29) (%)	Late term (n=2) (%)	Post term (n=9) (%)	
Fetal Distress	11 (38)	8 (36)	5 (56)	24 (40)
Cephalopelvic disproportion	3 (10)	4 (18)	1 (11)	8 (13)
Non-progress of Labor	4 (14)	3 (14)	0	7 (12)
Prolonged PROM	4 (14)	1 (5)	1 (11)	6 (10)
Absent Liquor	2 (7)	3 (14)	1 (11)	6 (10)
Severe Oligohydramnio	2 (7)	1 (5)	1 (11)	4 (7)
Persistent occipito-posterior	2 (7)	1 (5)	0	3 (5)
Obstructed labour	1 (3)	1 (5)	0	2 (3)

Table 8: Maternal complications.

Mode of delivery	Gestational Age (Weeks)			Total (%)
	Full term (n=99) (%)	Late term (n=65) (%)	Post-term (n=22) (%)	
PPH	7 (7)	8 (12)	4 (18)	19 (10)
Blood transfusion required to patient	9 (9)	6 (9)	3 (14)	18 (10)
Cervical tear	4 (4)	2 (3)	1 (5)	7 (4)
4th degree Perineal tear	2 (2)	3 (5)	1 (5)	6 (3)
Surgical site infection	3 (3)	2 (3)	1 (5)	6 (3)
Shoulder dystocia	0	1 (2)	1 (5)	2 (1)
Septicemia	1 (1)	0	0	1 (1)

Table 9: Distribution according to birthweight.

Birth weight (kg)	Gestational Age (Weeks)			Total (%)
	Full term (n=99) (%)	Late term (n=65) (%)	Post-term (n=22) (%)	
<2.5	3 (3)	2 (3)	0	5 (3)
2.5-3.49	63 (64)	39 (60)	11(50)	113 (61)
3.5-4	22 (22)	14 (22)	8 (36)	44 (24)
≥4	11 (15)	10 (15)	3 (14)	24 (13)

2.5-3.49 kg birthweight group was most common overall (61%) and in each group of full term (64%), late term (60%) and post-term (50%) pregnancies. Significant incidence of macrosomia (birth weight >4 kg) noted in full term (15%), late term (15%) and post-term (14%) pregnancies ($p<0.05$) (Table 9).

We noted APGAR scores at 1 minute and 5 min for each

birth. Score less than 7 was noted in of full term (11%), late term (19%) and post-term (28%) pregnancies at 1 minute. After neonatal resuscitative measures we noted 5-minute APGAR Score less than 7 in full term (8%), late term (14%) and post-term (18%) pregnancies. Significant incidence of fetal distress was noted with increasing gestational age ($p<0.05$) (Table 10).

Table 10: APGAR score.

Birth weight (kg)	Gestational age (weeks)			Total (%)
	Full term (n=99) (%)	Late term (n=65) (%)	Post-term (n=22) (%)	
At 1 min				
>7	88 (89)	53 (82)	16 (73)	157 (84)
4-7	5 (5)	5 (8)	3 (14)	13 (7)
<4	6 (6)	7 (11)	3 (14)	16 (9)
At 5 min				
>7	91 (92)	56 (8)	18 (82)	165 (89)
4-7	5 (5)	5 (8%)	2 (9)	12 (6)
<4	3 (3)	4 (6)	2 (9)	9 (5)

Table 11: According to early neonatal complications.

Early neonatal complication	Gestational Age (weeks)			Total (%)
	Full term (n=99) (%)	Late term (n=65) (%)	Post-term (n=22) (%)	
Neonatal jaundice	11 (11)	14 (22)	6 (27)	31 (17)
Birth asphyxia	5 (5)	6 (9)	3 (14)	14 (8)
Meconium aspiration syndrome	3 (3)	5 (8)	4 (18)	12 (6)
Birth injuries	1 (1)	0	0	1 (1)
Neonatal convulsions	2 (2)	1 (2)	1(5)	4 (2)
Still birth	2 (2)	1 (2)	0	3 (2)
Perinatal death	3 (3)	2 (3)	1 (5)	6 (3)

During study period total 22% babies required NICU admission for various causes. Average duration of neonatal stay was 3.42 ± 2.55 days. Most common causes for NICU admission were neonatal jaundice (17%), birth asphyxia (8%) and meconium aspiration syndrome (6%). In present study we noted total 3 still births and overall, 6 perinatal deaths (Table 11).

DISCUSSION

The first decision that must be made when managing a postdates pregnancy is whether or not to deliver. The World Health Organization (WHO) recommended induction of labour (IOL) on pregnant women with 41 completed weeks of pregnancy without spontaneous onset of labour.¹⁰ Induction of labour is recommended to prevent well known complications of prolonged pregnancy, such as increased incidence of perinatal mortality, stillbirth, meconium aspiration syndrome and macrosomia.^{11,12} But induction of labour itself carries the risk of uterine hyperstimulation, increased instrumental delivery, Caesarean section, uterine rupture and fetal distress.¹⁰

In present study from 186 pregnancies, 53% were full term (40 0/7 to 40 6/7 weeks), 35 % were late term and 12% were post-term. Our findings are comparable to the studies by Madhuri Gupta et al, and Kandalgaonkar et al, Madhuri Gupta et al in their study with 150 women,

54.7% were from 40-41 weeks group, followed by 37.3% in 41-42 weeks group and 8.0% in ≥ 42 weeks group.^{13,14}

Spontaneous delivery rate was 44.0%, delivery rate among induced women was 34% and cesarean section rate was 22.0% was noted in the study by Madhuri Gupta et al¹³. In present study elective LSCS rate was 10%. While in another Indian study maximum patients (53.7%) underwent spontaneous vaginal delivery, 9.5% patients required instrumental delivery and 37% patients underwent caesarean section.¹⁵

Dakshnamurthy et al in their study observed a minimal increase (7%) in the incidence of babies with increased birth weight (>3.6 kg) in the post-dated women at 41 weeks compared to 4% increase among 50 cases of post-dated women with labor induction at 40 weeks taken as controls. Kandalgaonkar et al noted that majority (80.2%) of the babies born weighed between 2.5 to 3.5 kg, in present study 61.2% were from birth weight between 2.5 to 3.5 kg.^{14,16}

Punya et al reported that as the gestational age increased after 40 weeks, an increase in maternal morbidities such as emergency LSCS, postpartum hemorrhage, instrumental delivery, etc. is noted.¹⁷ Similar findings were noted in present study. Perinatal mortality is defined as the prevalence of stillbirth and neonatal mortality within 7 days after birth. In present study we noted 3% perinatal mortality.

Studies supported the policy of induction of labor at 41 weeks gestation as a cost-effective method with lower rates of adverse obstetric outcomes including neonatal demise, shoulder dystocia, meconium aspiration and severe perineal lacerations without increasing the cesarean delivery rate when compared to a policy of expectant management until 42 weeks gestation.¹⁸ A recent systematic review concluded that “Women having IOL beyond 41-42 weeks is associated with fewer perinatal deaths and reduced CS rates, even though the number needed to treat to prevent perinatal mortality is high (approx. 450)”.¹⁹

However, studies compared outcomes from induction at 41 weeks gestation and expectant management until 42 weeks gestation and found not only an increased risk of interventions but a higher cesarean delivery rate in the group that underwent induction at 41 weeks.^{20,21}

Cochrane review concluded that policy of labor induction compared with expectant management is associated with fewer perinatal deaths and cesarean sections. But they also suggested that “women should be appropriately counseled in order to make an informed choice between scheduled induction for a late-term pregnancy and expectant management”.²²

As with every intervention in the natural birth process, the decision to induce labour must be made with caution, as the expected benefits should outweigh possible adverse effects for both mother and child.²³ Fetal macrosomia can lead to maternal and fetal birth trauma and arrest of labor, both the first and the second stages. So estimated fetal weight should be documented prior to beginning a postdates induction either by ultrasound examination or by abdominal examination.

The major limitation of present study were observational design and lack of randomization. Patients were allocated to a particular course of care, decision to proceed to cesarean delivery by their attending obstetrician, rather than being randomly assigned. In our institute, we encourage vaginal delivery. Different methods for IOL, cervical ripening methods, oxytocin augmentation protocols used during study period, so randomization was not possible, and this may have introduced selection bias and influenced our results. Larger, multicentric, prospective clinical trials are needed to compare the policy of labor induction compared with expectant management in patients with postdated pregnancy.

CONCLUSION

Pregnancies beyond 40 weeks require early detection, effective fetal monitoring and proper planning of labour. In pregnancies beyond 40 weeks, decision of induction should be taken cautiously as early induction leads to failure of induction and increased rates of LSCS, while delayed induction leads to increased fetal complications.

Pregnancy can be continued till 41 completed weeks with careful fetal monitoring and AFI measurement.

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