

## Study of Maternal and Fetal Outcomes between 37 To 42 Weeks of Pregnancy.

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### Abstract:

**Background :** The ACOG in 2013 redefined term pregnancy as Early term: 37 0/7 weeks through 38 6/7 weeks, Full term: 39 0/7 weeks through 40 6/7 weeks, Late term: 41 0/7 weeks through 41 6/7 weeks and Post term: 42 0/7 weeks and beyond. Recent data demonstrate that maternal and neonatal adverse outcome rates are not the same across the 5-week gestational age range that constitutes term. Rather, the frequency of adverse outcome is U-shaped with the nadir around 39 weeks 0 days through 40 weeks 6 days gestation.

**Aim :** to assess maternal and neonatal outcomes between 37 to 42 completed weeks of pregnancy and to determine the mean duration of normal pregnancy in regional population with reference to the incidence of reassuring fetal status.

**Methods :** observational study of 460 singleton pregnancies with well documented dates by clinical history and early USG dating.

**Results:** Of the 460 cases included in the study 40% were in 40-41wks of gestational age group followed by 34% in 39-40wks of gestational age, 1.7% are >42 wks gestational age. 75% of pregnancies delivered spontaneously within  $\pm 1$  week of EDD. Among the primigravida 40% delivered at gestational age 40-41wks followed by 32% in 39-40wks of gestational age. Instrumental deliveries are maximum at 41 – 42 wks of gestation (36.5%). Expectant management at 40 to 41 wks was associated with lower incidence of C.sections as compared to induction of labour. (10.6% vs 26.2%). At 41-42 weeks of gestational age induction of labour decreased caesarean section rate (11% in the induction group compared with 45% in the expectant group). The incidence of meconium stained liquor increased from 13.5% at 38 +6days to 65.5% at 40+6 days. The incidence of NICU admissions increased from 17% to 56.2% between 38 wks to 41 wks of gestation.

**Conclusion:** As gestation age advances from 37 to >42 wks, rate of normal vaginal deliveries decreases and rate of instrumental vaginal deliveries and caesarean section increases. Adverse fetal outcome increases as gestation advances from 37 to >42 weeks of gestation with meconium stained liquor seen in 13% of pregnant women delivered at 37 weeks of gestation as compared with 100% at 41 + wks of pregnancy.

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### I. Introduction

The duration of a pregnancy is a significant determinant of its outcome. The International Classification of Diseases defines term pregnancy as delivery between 37 weeks 0 days and 41 weeks 6 days. Recent data demonstrate that maternal and neonatal adverse outcome rates are not the same across the 5-week gestational age range that constitutes term. To address the lack of uniformity in neonatal outcome between 37 0/7 weeks of gestation and 42 0/7 weeks of gestation, the ACOG in 2013 redefined term pregnancy as 1 : Early term: 37 0/7 weeks through 38 6/7 weeks Full term: 39 0/7 weeks through 40 6/7 weeks Late term: 41 0/7 weeks through 41 6/7 weeks Post term: 42 0/7 weeks and beyond [ 1].

It is well known that only 4% of pregnant women deliver on their expected date of delivery. It has been alternatively shown that fetal maturity may be attained as early as 3 weeks prior to EDD or as late as 2 weeks after the calculated EDD. Persistent ethnic disparities in the average duration of pregnancy have been described [2,3]. There is a study showing that South Indian fetuses may mature early [4]. The incidence of postdated pregnancy decreases as the accuracy of dating criteria used increases and it varies according to the definition used and the population studied. In a study by Blondell et al, the incidence of postdated pregnancy was 7.5% when the diagnosis was based on menstrual dating and the incidence was 2.6% when the dating was based on early ultrasound examination and 1.1% when the ultrasound and menstrual dating coincided [5,6]. Gulmezoglu AM, et al, reviewed 22 trials reporting on 9383 women and showed that a policy of labour induction compared with expectant management in pregnancies beyond 40 wks is associated with fewer perinatal deaths and fewer caesarean sections. Some infant morbidity such as meconium aspiration syndrome were also reduced with a policy of post term labour induction although no significant differences in the rate of NICU admission were seen [7].

## II. Materials and Methods

An observational study of 460 antenatal cases with singleton pregnancy, irrespective of parity, with excellent /good dates, with 1<sup>st</sup> trimester dating USG and between 37 to 42 weeks of gestation, were studied between Jan 2014 to November 2015 at Gandhi Hospital, Secunderabad, a tertiary care facility. In women with poor dates 1st trimester ultrasound dating of gestational age was used. In women receiving antenatal care from 1st trimester onwards the date of urine pregnancy testing and antenatal record of fundal height in 2nd trimester were also used. Women with co morbid medical conditions, with previous cesarean deliveries and fetal growth restriction were excluded.

In women presenting beyond 40+6 days (one week after EDD), labour was induced with prostaglandin E2 gel and oxytocin infusion.

## III. Results

The mean age of the study population was 24 years. 34% were in the gestational age group 39-40 wks, 40% between 40-41 wks and 1.7% were beyond 42 wks of pregnancy. In the present study 58.3% of cases are primigravida, Gravida 2 constitute 27%.

**Table 1. Induction of labour at each gestational age**

Gestational age in weeks	Spontaneous onset n (%)	Induction n (%)
37-38wks(n=19)	19 (100%)	
38-39wks(n=53)	53(100%)	
39-40wks(n=158)	158(100%)	
40-41wks(n=184)	104(56.5%)	80(43.5%)
41-42wks(n=38)	11(29%)	27(71%)
>42wks(n=8)	2(25%)	6(75%)

75% of the cases set into spontaneous labour by 40+6 days. As gestational age advances from 37 to 42 weeks of gestation, rate of induced labour increased from no inductions at 37 wks to 71% induced labour at 41+6 wks.

**Table 2: Mode of delivery at each gestational age**

GA	37-38wks	38-39wks	39-40wks	40-41wks	41-42wks	>42wks
Vaginal delivery	18(94.7%)	49(92.5%)	141(89.2%)	141(76.6%)	16(42.1%)	2(25%)
Instrumental delivery	-	1(1.9%)	5(3.2%)	11(6%)	14(36.5%)	2(25%)
Caesarean delivery	1(5.3%)	3(7.5%)	12(7.6%)	32(17.4%)	8(21.4%)	4(50%)

The rate of caesarean deliveries was 9 times more at 41+6 days(50%) as compared to 7.6% at 38+6 days of gestation. There is a statistically significant difference between spontaneous and induced labour leading to either normal vaginal delivery or caesarean section at 41-42 weeks of gestation and more induced pregnant women had normal vaginal delivery (p value is 0.03 calculated using Fisher's exact test). 29.5% of the induced labours underwent C-sections.

**Table 3 : Outcome of expectant management vs. induction of labour at 40-41 wks and 41-42 wks**

Gestational age	Mode of delivery	Expectant group n=104 (%)	Induction n(%)
40 - 41 wks n=184	Vaginal delivery	93	59
	C.Section	11 ( 10.1%)	21(28.2%)
41 -42 wks n=38	Vaginal delivery	6	24
	C.Section	5(45.4%)	3(11%)

There is a statistically significant difference between expectant management and induced labour leading to either normal vaginal delivery or caesarean section at 40-41 weeks of gestation and more induced pregnant women underwent caesarean section (28.2%) (p value is 0.0006 calculated using chi square test).

There is a statistically significant difference between expectant management and induced labour leading to either normal vaginal delivery or caesarean section at 41-42 weeks of gestation and more induced pregnant women had normal vaginal delivery (p value is 0.03 calculated using Fisher's exact test).

The higher C.section rates in the gestational group 40-41 wks under going induction of labour as compared to the 41-42wks group was due to the higher number of failed inductions in the group 40 – 41 wks of gestation.

**Table4.Indication for Cesaerean Section at each gestational age**

indications	37-38wks n=19	38-39wks n=53	39-40wks n=158	40-41wks n=184	41-42wks n=38	>42wks n=8
Failed induction	-	-	-	17	2	-
Secondary arrest of dilation	-	1	5	5	1	-
Thick MSLwith fetal distress	1	1	4	5	2	3
CPD	-	1	3	2	1	-
Severe oligohydramnios	-	-	-	3	2	1
Total	1	3	11	32(17.3%)	8(22.3%)	4

Fetal distress in the form of meconium stained liquor or oligoamnios accounted for 50% of the C.sections in pregnancies beyond 42 wks as compared to 4.4% at 40-41 wks.

**Table5: fetal outcome between 37 to 42 wks of pregnancy**

Fetal outcome	37-38wks n=19	38-39wks n=63	39-40wks n=158	40-41wks n=184	41-42wks n=38	>42wks n=8
Low APGAR 1min	3( 15.8% )	9(17% )	15(9.5% )	43(23.4% )	20(53.6%)	6(75% )
Low APGAR 5min	1(5.3%)	5( 9.4 %)	11( 7 %)	36(19.6 %)	17(44.7 %)	6(75 %)
Birth weight >3.5kg	0	3(5.7 %)	9(5.7%)	6(3.3 %)	12(31.6 %)	6(75%)
Meconium stained liquor	1(5.3 %)	7(13.2 %)	33(20.9 %)	120(65.2%)	38(100 %)	8(100%)
NICU admission	3(15.8 %)	9(17 %)	15(9.5 %)	43(23.4 %)	20(52.6 %)	6(75%)
neonatal death	0	0	1	1	3	3

Fetal morbidity increases significantly between 40-41 wks to 41-42 wks

Discussion : Recent data demonstrate that maternal and neonatal adverse outcome rates are not the same across the 5-week gestational age range that constitutes term.

The duration of pregnancy varies according to ethnicity of the mother. Balchin et al found that median gestational age at delivery for a singleton pregnant women was 39 completed weeks in the black and Asian ethnic groups[2] . In another study, Coughy et al noted that ethnic groups like the African American and the Asian population were much less likely to reach 41 and 42 weeks of gestation[7]. There is a study showing that south Indian fetuses may mature early[3]. Therefore, the duration of pregnancy and subsequent management would need to be different for these groups of population[14].In our study the mean gestational age at delivery was 39 wks 5 days.

Present study shows percentage of post term pregnancy is 1.7%. Blondell and colleagues(2002) analysed 44,623 woman for post term pregnancy rates. The proportion of post term births was 6.4% when based on LMP alone, but was 1.9% when based on sonographic measurements alone[4]. Another study conducted by Coughy and co-workers shows that Sonographic pregnancy dating at 12 weeks or less resulted in a 2.7% incidence of post term gestation compared with 3.7% in a group assessed at 13 to 24 weeks[7]

In the present study younger age(<25years)was significantly associated with pregnancies going beyond 40 wks ,whereas in a study by Coughy etal age group 30 -39 is associate more often with post term pregnancy[8]. In the present study percentage of caesarean section are increased from 37 to >42 weeks of gestation .

Rate of C.sections 37 to 42 wks of pregnancy

Gestational age in weeks	Bhat RA et al 2006 <sup>21</sup>	Aaron B Caughey et al 2007 <sup>23</sup>	Cheng YW et al 2009 <sup>24</sup>	Present study
37-38wks	5.8%	9.9%	13.26%	5.3%
38-39wks	8.7%	8.2%	12.82%	7.5%
39-40wks	8.4%	8.8%	12.81%	7.6%
40-41wks	14.6%	9%	14.08%	17.4%
41-42wks	20%	14%	19.83%	21.4%%
>42wks		21.7%	-	50%

In the present study at 41-42 wks 29% cases went into spontaneous onset of labour whereas 71% underwent induction with statistically significant difference in the mode of delivery. Induction of labour resulted in significant decrease in the percentage of caesarean section compared to spontaneous group(11% in induced group, 45.4% in spontaneous group). This study is comparable to a study conducted by Caughey et al in which 9 randomized controlled trials were included where at or beyond 41 weeks of gestation expectant management of pregnancy was associated with approximately 22% higher rate of caesarean delivery than elective induction of labour[8,11].

This is also comparable to the study of Gulmezoglu AM et al ,who reviewed 22 trials reporting on 9383 women. Compared with a policy of expectant management, a policy of labour induction was associated with fewer (all-cause) perinatal deaths: risk ratio (RR) 0.31, 95% confidence interval (CI) 0.12 to 0.88; 17 trials, 7407 women. There was one perinatal death in the labour induction policy group compared with 13 perinatal deaths in the expectant management group. The number needed to treat to benefit (NNTB) with induction of labour in order to prevent one perinatal death was 410 (95% CI 322 to 1492).

For the primary outcome of perinatal death and most other outcomes, no differences between timing of induction subgroups were seen; the majority of trials adopted a policy of induction at 41 completed weeks (287 days) or more.

Fewer babies in the labour induction group had meconium aspiration syndrome (RR 0.50, 95% CI 0.34 to 0.73; eight trials, 2371 infants) compared with a policy of expectant management. There was no statistically significant difference between the rates of neonatal intensive care unit (NICU) admission for induction compared with expectant management (RR 0.90, 95% CI 0.78 to 1.04; 10 trials, 6161 infants). For women in the policy of induction arms of trials, there were significantly fewer caesarean sections compared with expectant management in 21 trials of 8749 women (RR 0.89, 95% CI 0.81 to 0.97).

The authors concluded that a policy of labour induction compared with expectant management is associated with fewer perinatal deaths and fewer caesarean sections. Some infant morbidities such as meconium aspiration syndrome were also reduced with a policy of post-term labour induction although no significant differences in the rate of NICU admission were seen[6].

As gestational age advances from 37 to 42 weeks of gestation, rate of normal vaginal deliveries decreased from 94.7% at 37 wks to 25% at >42wks

The incidence of perineal lacerations increased from 0.6% at 38 -39 wks as compared to 25% at 41+6 wks.The incidence of postpartum haemorrhage increased from 3.8% to 13.8% between 38 to 41 wks of gestation.

Complications such as chorioamnionitis, severe perineal lacerations, caesarean delivery, postpartum haemorrhage increase progressively after 39 weeks of gestation[8,9,10] .

Of more concern as the pregnancy goes past dates is condition of the fetus in utero and the neonate. Meconium passage in utero is both physiological and pathological. Meconium passage is a manifestation of normal maturation and increased myelination and responsiveness of the fetal gastrointestinal tract . It was hypothesized that evidence of meconium stained amniotic fluid increases with each week of gestational age and may vary among ethnic groups[12,13,15] .

**Meconium staining of liquor:**

Gestational age in weeks	Bhat RA et al 2006 <sup>21</sup>	Cheng YW et al 2008 <sup>24</sup>	Present study
37-38wks	-	2.27%	13.2%
38-39wks	9.6%	3.24%	20.9%
39-40wks	13.8%	5.2%	65.2%
40-41wks	26.3%	7.39%	100%
41-42wks	30%	10.33%	100%

Meconium stained amniotic fluid was recorded even at 37 weeks of gestation but the proportion increased significantly as gestational age advances from 37 to >42 wks. In the present study, the percentages are far higher as compared to other studies, which may be due to the small sample size of cases beyond 41 wks of gestation

**IV. Conclusion**

The incidence of postdated pregnancy in this study was 1.7%. Mean gestational age at the onset of labour was 39 weeks 5 days. There is significant difference in the rate of C-section between 37 to 42 wks (5.3% and 50% respectively) of gestation. Expectant management at 40 to 41 wks was associated with lower incidence of C-sections as compared to induction of labour (10.6% vs 26.2%). At 41-42 weeks of gestational age induction of labour decreased caesarean section rate (11% in the induction group compared with 45% in the expectant group). Adverse fetal outcome increases as gestation advances from 37 to >42 weeks of gestation with meconium stained liquor seen in 13% of pregnant women delivered at 37 weeks of gestation as compared with 100% at 41 + wks of pregnancy.

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