International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Agrawal N et al. Int J Reprod Contracept Obstet Gynecol. 2023 Jul;12(7):2057-2061
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20231910

Original Research Article

Feto-maternal outcome in early-term, full-term, late-term and post-term pregnancies at a tertiary centre in India

Nisha Agrawal[1], Jyoti Nath Modi[2]*

[1]Department of Obstetrics and Gynaecology, Shri Balaji Institute of Medical Science, Raipur, Chhattisgarh India
[2]Department of Obstetrics and Gynaecology, All India Institute of Medical Sciences, Bhopal, Madhya Pradesh, India

Received: 08 June 2023
Accepted: 23 June 2023

***Correspondence:**
Dr. Jyoti Nath Modi,
E-mail: modijn@gmail.com

ABSTRACT

Background: The risk of perinatal complications does not remain consistent over the 5-week period between 37-42 weeks taken as 'Term pregnancy'. The American College of Obstetrics and Gynecology (ACOG) has further classified this period into Early term (ET) (37-38+6 weeks), Full term (FT) (39-40+6 weeks) and Late term (LT) (41-41+6 weeks), besides Post term (PT) (>42 weeks). The present study evaluates the feto-maternal outcomes in deliveries at various term gestations as per this new classification in Indian settings.
Methods: This is a retrospective record-based study of women delivering at a tertiary care medical college hospital in central India between 1st January 2014 and 31st December 2017. Low risk spontaneous deliveries with confirmed gestational age of 37 completed weeks or more, with single fetus in vertex presentation were analyzed. Those with incomplete records or complications such as preeclampsia, gestational diabetes mellitus, heart disease, antepartum hemorrhage, etc. were excluded.
Results: Out of 1498 case-records that satisfied the criteria, 722 (48.2%) were ET; 690 (46.1%) were FT; 76 (5%) were LT and 10 (0.7%) were PT. A significantly higher proportion of women who delivered post-term were from rural area, lacked institutional antenatal care visits and had lesser formal education. Caesarean Section (CS) rate was significantly higher in the PT group (60%) compared to the other groups ET (40.9%), FT (39.7%), and LT (39.5%). The PT group also had a significantly higher rate of Meconium-Stained Liquor (MSL), APGAR<7 and still births. The maternal and fetal parameters were not significantly different between the ET, FT and LT groups except birth weight (BW).
Conclusions: The post-term pregnancies have a higher risk of MSL, still birth, APGAR <7, and delivery by CS. Women with lesser education, those from rural areas and who have not received institutional antenatal care are more likely to report in late and PT. Larger studies in our settings are needed to evaluate and compare the maternal and fetal outcomes in pregnancies delivering at ET, FT, LT and PT gestations.

Keywords: Gestational age, Early term, Full term, Late term, Post term, Perinatal, Feto-maternal outcome

INTRODUCTION

The World Health Organization (WHO) and the International Federation of Gynecologists and Obstetricians (FIGO) have defined 'Term delivery' as that occurring between 259 and 294 days i.e. between 37 weeks and 42 weeks period of gestation from the last menstrual period.[1] The pregnancies that continue beyond the Expected Date of Delivery (EDD), i.e. gestational age 40 weeks or 280 days, have been called 'prolonged' pregnancies and those that are 42 weeks and beyond are designated 'Post term (PT)' pregnancies. About 4-15% of pregnancies result in being prolonged depending on the method used to calculate gestational age and region.[2,3] Ultrasonographic dating in 1st trimester improves reliability of gestation estimation and this has corrected or reduced true incidence of PT pregnancy by 50%.[4]

However, it was also observed that the perinatal outcomes are not consistent over the 5-week period 37-41+6 weeks labeled as 'Term'.[5,6] In 2013, American College of Obstetrics and Gynecology has recommended that the label 'Term' to be replaced with following designations to more accurately describe deliveries occurring at or beyond 37 weeks period of gestation.[7]

Early term: 37 weeks through 38 weeks 6 days period of gestation

Full term: 39 weeks through 40 weeks 6 days period of gestation

Late term: 41 weeks through 41 weeks 6 days period of gestation

Post term: 42 weeks of gestation and beyond.

There is a gradual decline in Amniotic Fluid (AF) volume after 38 weeks of pregnancy, becomes steeper after 41 weeks and nearly four times after 42 weeks. The combination of reduced AF, continued fetal growth and arrested placental growth may lead to decreasing placental nutrient reserve, compromised fetal circulation and eventually fetal distress. Hence there is a rise in perinatal morbidity and mortality with increasing gestational age. The fetal complications may include perinatal death, macrosomia, meconium aspiration, fetal asphyxia, post maturity syndrome, birth trauma to baby and cesarean delivery.[8] The maternal complications include an increase in labor dystocia (9-12% vs 2-7% at term), severe perineal injury (3rd and 4th degree perineal lacerations) related to macrosomia (3.3% vs 2.6% at term), operative vaginal delivery, and a doubling in the rate of cesarean delivery (14% versus 7% at term). The cesarean section is associated with higher risks of complications such as endometritis, hemorrhage as well as thromboembolic disease.[9]

While post-term pregnancy and also prolonged pregnancy are well recognized at-risk conditions for perinatal outcomes, the variation in outcomes when delivered prior to 42 weeks with gestational term as per the new classification has not been studied widely. The present study was conducted with the aim to study and compare the clinico-demographic profile and the feto-maternal outcome at various gestational terms at delivery at our institute. This will help identify the women at risk for prolonged pregnancy, and also in deciding the timing of planned deliveries and intervention.

METHODS

This retrospective record-based study was initiated after obtaining approval from the Institutional Ethics Committee. Data was collected from hospital record of 3 years from 1 January 2014 to 31 December 2016 of women delivered at People's Hospital Bhopal.

Women with regular menstrual cycle with confirmed gestational age by date of last menstrual period and ultrasonography (first or second trimester) with singleton pregnancy with vertex presentation delivered at 37 or more weeks of gestation at our hospital were included in the study.

Patients with incomplete records, unconfirmed gestational age, congenital anomalies, pre-existing or gestational diabetes, heart diseases, hypertensive disorders of pregnancy, antepartum haemorrhage, multiple gestation and non-vertex presentation were excluded from study.

The maternal demographic parameters noted were age, area of residence (rural/urban), and education. The independent variable studied was gestational age at delivery and the groups were allocated accordingly as Early term (ET), Full term (FT), Late term (LT) and PT. The other maternal variables noted were parity (primigravida or multigravida), antenatal care in form of ANC Clinic booking status, and the mode of delivery as a maternal outcome variable. Booked patients were defined as those who attended antenatal clinic in any hospital 3 or more times during pregnancy.

The dependent variables for fetal outcome were presence of Intrauterine Growth Restriction (IUGR), oligohydramnios, Birth Weight (BW), APGAR <7, presence of Meconium Stained Liquor (MSL), need for Neonatal ICU (NICU) admission and still birth.

Data was tabulated and statistically analyzed using MS excel. Chi-square test and Fisher exact test were used to compare proportions in categorical data. Student t test was used to compare the means. P value was considered significant at <0.05.

RESULTS

A total of 1498 case records that fulfilled the inclusion criteria were analyzed of which 722 (48.2%) were ET; 690 (46.1%) were FT; 76 (5%) were LT and 10 (0.7%) were PT as in Figure 1. Frequency of PT pregnancy was 0.7%.

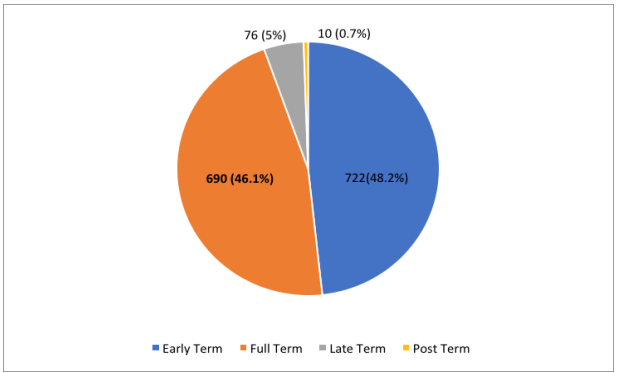

Figure 1: Frequency distribution of gestational age.

The mean age of the women whose records were included was 25.49 years (SD 3.7), and this did not vary significantly between the various gestational term groups (Table 1). Overall, a majority (1028/1498; 68.6%) of women had received institutional antenatal care. However, in the PT group the only 30% of women were booked and this was significantly different from the other three groups, i.e.ET, FT and LT groups (Table 1).

About one fourth of women (24.4%) were residents of rural areas in the entire group, but in the PT group a majority (70%) of women came from rural areas. This was significantly different from other 3 groups (Table 1).

The education status of women in the PT group was significantly different from the other three groups with only 30% women educated upto class 10 or beyond, compared to 73.3% in ET group, 66.2% in FT group and 65.8% in the LT group. Overall, 69.4% women (1039/1498) had were educated till class 10 or beyond (Table 1).

There was significantly higher proportion of primigravidae in the PT group compared to the other groups (60% versus 36.1% in ET, 42.8% in FT and 39.5% in LT groups respectively). Overall, 39.5% (592/1498) were primigravidae.

The Table 2 shows the mode of delivery in women according to the different gestational terms at delivery. The CS rate for the entire group was 47.7% (614/1498). There was a significant variation in the mode of delivery between the various groups with highest CS rate being for the PT group (60%) compared to ET (49.4%), FT (46.2%) and LT (42.1%).

The frequency of IUGR and oligohydramnios at delivery among various gestational term groups is shown in Table 3. Overall, 1.9% (29/1498) had IUGR and 6.3% (94/1498) had oligohydramnios at delivery. The frequency of IUGR did not vary significantly among the various groups. However, the frequency of oligohydramnios was significantly different in the various groups with the highest being in PT group (50%).

Overall, the majority of neonates had BW of 2.5-3 kg (848/1498; 56.6%), while 18.6% (278/1498) had BW <2.5 kg. The variation of BW was significantly different in the four gestation term groups with a consistent increase in BW with increasing gestation (Table 4).

The frequency of neonatal APGAR <7 was 3.3%, MSL 3.1%, need for NICU admission 3.6% and still birth in 3.3% pregnancies for the entire study group (Table 4). The proportion of neonatal APGAR score <7 at birth was significantly higher (40%) in the PT group than in the other three groups. Similarly, the presence of MSL was observed with a significantly higher frequency (30%) in the PT group than in the other 3 groups. The rate of NICU admission did not vary significantly among the groups. Still birth was observed with a significantly higher frequency in the PT group (Table 4).

Table 1: Demographic characteristics of women delivering at various gestational terms.

Gestational term at delivery	Mean age (in years) (± SD)	No. of women who were booked antenatal at PH, (%)	No. of women residing in rural area, (%)	No. of women with literacy till class 9, (%)	No. of women with literacy upto class 10 or higher, (%)	No. of primi-gravida, (%)	No. of multi-gravida, (%)
ET, (n=722)	25.89 (4.05)	518 (71.7)	165 (22.9)	193 (26.7)	529 (73.3)	261 (36.1)	461 (63.9)
FT, (n=690)	25.25 (3.9)	453 (65.7)	176 (25.5)	233 (33.8)	457 (66.2)	295 (42.8)	395 (57.2)
LT, (n=76)	25.68 (3.8)	54 (71.1)	17 (22.4)	26 (34.2)	50 (65.8)	30 (39.5)	46 (60.5)
PT, (n=10)	25.17 (3.1)	3 (30)	7 (70)	7 (70)	3 (30)	6 (60)	4 (40)
Total, (n=1498)	-	1028 (68.6)	365 (24.4)	459 (30.6)	1039 (69.4)	592 (39.5)	906 (60.5)
Test statistic p value*	NS	12.28, 0.006	12.84, 0.005	16.11, 0.001		8.20, 0.419	

*P value significant at <0.05.

Table 2: Mode of delivery of women delivering at various gestational terms.

Gestational term at delivery	Number of women who delivered vaginally, (%)	Number of women who delivered by emergency CS, (%)	Number of women who delivered by elective CS, (%)	Total number of women who delivered by CS, (%)
ET, (n=722)	365 (50.6)	295 (40.9)	62 (8.6)	357 (49.4)
FT, (n=690)	371 (53.7)	274 (39.7)	45 (6.5)	319 (46.2)
LT, (n=76)	44 (57.9)	30 (39.5)	2 (2.6)	32 (42.1)
PT, (n=10)	4 (40)	6 (60)	0	6 (60)
Total, (n=1498)	784 (52.3)	605 (40.4)	109 (7.3)	714 (47.7)
Test statistic p value*		12.28, 0.006	12.84, 0.005	16.11, 0.001

*P value significant at <0.05

Table 3: Frequency of IUGR and oligohydramnios in pregnancies delivered at various gestational terms.

Gestational term at delivery	Number of pregnancies with IUGR, (%)	Number of pregnancies with oligohydramnios, (%)
ET, (n=722)	14 (1.9)	47 (6.5)
FT, (n=690)	15 (2.2)	38 (5.5)
LT, (n=76)	0	4 (5.3)
PT, (n=10)	0	5 (50)
Total, (n=1498)	29 (1.9)	94 (6.3)
Test statistic p value*	3.41, 0.332	33.34, <0.001

*P value significant at<0.05

Table 4: Fetal outcome in women delivering at various gestational terms.

Gestational term at delivery	BW-<2.5 kg, (%)	BW-2.5-3 kg, (%)	BW-3.1-4 kg, (%)	Apgar score <7, (%)	MSL, (%)	NICU admission, (%)	Still birth, (%)
ET, (n=722)	170 (23.5)	418 (57.9)	134 (18.6)	21 (2.9)	17 (2.4)	20 (2.8)	1 (0.1)
FT, (n=690)	100 (14.5)	384 (55.7)	206 (29.9)	23 (3.3)	23 (3.3)	31 (4.5)	2 (0.3)
LT, (n=76)	8 (10.5)	39 (51.3)	29 (38.2)	1 (1.3)	3 (3.9)	2 (2.6)	1 (1.3)
PT, (n=10)	0	7 (70)	3 (30)	4 (40)	3 (30)	1 (10)	3 (30)
Total, (n=1498)	278 (18.6)	848 (56.6)	372 (24.8)	49 (3.3)	46 (3.1)	54 (3.6)	7 (0.5)
4 group comparison: test statistic p value*	23.27, <0.001			43.86, <0.001	25.96, <0.001	4.40, 0.222	190.845, <0.001
3 group comparison (ET, FT, LT): test statistic p value*	22.544, <0.001			1.014, 0.602	1.524, 0.467	3.231, 0.199	3.576, 0.167

*P value significant at <0.05

A shown in Table 4, when only three gestational term groups (ET, FT, LT) between 37-41 weeks were analysed, no significant difference was observed between the groups for fetal outcome variables of APGAR <7, presence of MSL<NICU admission and still birth. However, the BW varied significantly between the groups with highest proportion of BW<2.5 kg in the ET group followed by the FT and the LT groups.

DISCUSSION

The present study is a 3-year retrospective record-based study in tertiary care setting of a teaching hospital in central India. Of the total 1498 women, 48.2% were ET, 46.1% were FT, 5% were LT and 0.7% were PT. The frequency of PT pregnancy was less than that reported by other studies, (8.3%) by Ingemarsson et al; 7.6% by Ahanya et al.[10,11] Zeitin et al studied the variation in rates of PT pregnancies in Europe and found the incidence as 0.4 to 7.1% with an average of 3.7%.[12]

The low frequency (0.7%) of post-term pregnancy observed is possibly because of urban setting with antenatal clinic and majority of women being from urban areas and booked for institutional antenatal care. A significantly higher proportion of women in the PT group was from rural areas, with lesser level of education (class 9 or less) and unbooked at ANC clinic. This could explain the reluctance of women to seek regular antenatal care and timely care for prolonged pregnancy. Maternal age, education, marital status, parity, and prenatal care usage were associated with ethnic group-specific PT delivery rates according to Collins et al.[13] Some variability in these rates may also be due to difference in methods for determining gestational age, which has broader implications for international comparisons of gestational age, including rates of PT and preterm births and small-for-gestational-age newborns, etc.

Among 1498 women, 52.3% delivered vaginally and 47.7% by CS with the highest CS rate being in the PT group. Similar finding was also observed in a study conducted by Luckas et al which compared outcomes of spontaneous labor in uncomplicated term and post-date pregnancy.[14] The higher CS rate in PT pregnancies may be due to big baby, presence of MSL and placental maturation leading to fetal jeopardy during labor.[15-18]

An increased rate of neonatal morbidity was observed in the PT gestational term group in our study: MSL in 30%, APGAR of score <7 in 40%, NICU admission in 10% and still birth in 30%. Similar results reported by Adhikari et al.[18] A study from Denmark by Olessen et al showed the risk of perinatal and obstetric complications to be high in PT delivery compared with term delivery with the risk of perinatal death being 1.33.[17] Aspiration of meconium was reported as a leading cause of perinatal death by Kistka et al.[19]

A key finding in our study also has been that the fetal outcome parameters did not vary significantly between the ET, FT and LT groups when the analysis was done after excluding the PT group. Hence the variation or gradient in feto-maternal outcomes was not observed at gestations prior to 42 weeks as has been seen in earlier studies.[5,6] Larger prospective studies with a bigger sample size are needed to explore in-depth the difference in maternal and fetal outcomes when delivery occurs in ET, FT and LT gestational terms.

CONCLUSION

The post-term pregnancies have a higher risk of MSL, still birth, APGAR <7, and delivery by CS. Women with lesser education, those from rural areas and who have not received institutional antenatal care are more likely to report in late and PT. Larger studies in our settings are needed to evaluate and compare the maternal and fetal outcomes in pregnancies delivering at Early term, Full term and Late term gestations.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. World Health Organization (WHO). International Classification of Diseases, Eleventh Revision (ICD-11), (2019) Available at: https://icd.who.int/browse11/l-m/en#/http%3A%2F%2Fid.who.int%2Ficd%2Fentity%2F1864248550. Accessed on 3 May 2023.
2. Spong CY. Defining term pregnancy: recommendations from the defining term pregnancy workshop. JAMA. 2013;309:2445-6.
3. Singh N, Misra D, Srivastava S. Postdated pregnancy: its maternal and fetal outcome. Int J Reprod Contracept Obstet Gynecol. 2020;9:3223-7.
4. Ingenmarsson I, Heden L. Cervical score and onset of spontaneous labour in prolonged pregnancy dated by second trimester ultrasound scan. Obstet Gynecol. 1989;74:102-5.
5. Reddy UM, Bettegowda VR, Dias T, Yamada-Kushnir T, Ko CW, Willinger M. Term pregnancy: a period of heterogeneous risk for infant mortality. Obstet Gynecol. 2011;117:1279-87.
6. Tita AT, Landon MB, Spong CY, Lai Y, Leveno KJ, Varner MW et al. Timing of elective repeat cesarean delivery at term and neonatal outcomes. Eunice Kennedy Shriver NICHD Maternal-Fetal Medicine Units Network. N Engl J Med. 2009;360:111-20.
7. Definition of term pregnancy. Committee Opinion No. 579 (Reaffirmed 2022). American College of Obstetricians and Gynecologists. Obstet Gynecol. 2013;122:1139-40.
8. Postterm Pregnancy. In: Cunningham F, Leveno KJ, Bloom SL, Dashe JS, Hoffman BL, Casey BM, Spong CY, eds. Williams Obstetrics, 25th ed, New York, NY. 2018.
9. Treger M, Hallak M, Silberstein T. Post-term pregnancy: should induction of labor be considered before 42 weeks? J Maternal Fetal Neonatal Med. 2002;11(1):50-3.
10. Ingemarsson I, Kallen K. Stillbirths and rate of neonatal deaths in 76,761 post term pregnancies in Sweden, 1982-1991: a register study. Acta Obstet Gynecol Scand. 1997;76:658-62.
11. Ahanya SN, Lksmanan J, Morgan BL, Ross MG. Meconium passage in utero-mechanisms consequences, and management. Obstet Gynecol. 2005;60:45-56.
12. Zeitlin J, Blondel B, Alexander S, Breart G. Variation in rates of post term birth in Europe: reality or artifact. BJOG. 2007;1.
13. Collins JW, Schulte NF, George L, Drolet A. Post term delivery among African Americans, Mexican Americans and Whites in Chicago. Ethinic Dis. 2001;11:181-7.
14. Luckas M, Buckett W, Alfirevic Z. Comparison of outcomes in uncomplicated term and post-term pregnancy following spontaneous labor. J Perinat Med. 1998;26:475.
15. Anner K, Evgenij B, Jon O, Andrej M. Secular trend in pregnancy outcome in 1980-1999 in Komi republic, Russia. Int J Circumpolar Health. 2007;5:66-8.
16. Kassis A, Mazor M, Leiberman JR, Cohen A, Insler V. Management of post-date pregnancy: a case control study. Israeal J Med Sci. 1991;27:82-6.
17. Olesen AW, Westergaard JG, Olsen J. Perinatal and maternal complications related to post term delivery: a national registerbased study, 1978-1993. Amer J Obstet Gynecol. 2003;189:222-7.
18. Adhikari M, Gouwse E, Velaphi SC, Gwamanda P. Meconium aspiration syndrome: Importance of monitoring of labour. J Pperinatol. 1998;18:55-60.
19. Kistka ZA, Palomar L, Baslaugh SE, Debaun MR, Defranco EA, Muglia LJ. Risk of post term delivery after post term delivery. Amer J Obstet Gynecol. 2007;196:241-6.

Cite this article as: Agrawal N, Modi JN. Feto-maternal outcome in early-term, full-term, late-term and post-term pregnancies at a tertiary centre in India. Int J Reprod Contracept Obstet Gynecol 2023;12:2057-61.