



## **Short Term Outcomes of Early Term Neonates in a Tertiary Care Centre: A Descriptive Study**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

### **Article Information**

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### **ABSTRACT**

**Introduction:** The number of babies delivered between 37 weeks to 38 weeks and 6 days has been on the rise with increase in lower segment caesarian section (LSCS). These early term neonates have increased risk of developing respiratory distress syndrome, neonatal hyperbilirubinemia, transient tachypnoea, prolonged hospital stays, hypothermia, and feeding difficulty, when compared to a term neonate. An audit of early term neonatal short-term outcomes was undertaken at our institute.

**Methodology:** A retrospective descriptive cross-sectional study was carried out between July 2020 and December 2020 at a private medical college Neonatal Intensive Care Unit. Neonates with a gestation age of 37 weeks and 0 days to 38 weeks and 6 days born were included.

**Results:** A total of 137 early term delivery data were obtained. Hypothyroidism (23%) and gestational diabetes (23%) were found to be the most common associated antenatal problems. The most common morbidity out of 137 early term neonates was neonatal jaundice 91(66.4%) followed by respiratory distress which affected 38 (28%) neonates.

**Conclusion:** This study establishes the high incidence of neonatal jaundice and respiratory morbidities in early term neonates. Hence it is better to avoid elective LSCS before 39 weeks of gestation provided there are no medical indications for the same.

**Keywords:** Early term neonate; neonatal jaundice; respiratory morbidity.

## 1. INTRODUCTION

A child's risk of death is 15 times greater in the first 4 weeks of life [1], which may be due to various causes. It is important to know the various preventable causes of neonatal mortality for timely intervention and reduction of perinatal morbidity. Although prematurity has been the most common cause of perinatal morbidity [2], more recent evidences suggest that early term deliveries contribute to an extent to neonatal morbidity [3,4,5]. American College of Obstetricians and Gynecologist defines early term delivery as delivery of baby between the gestational periods from 37 weeks to 38 weeks and 6 days [6].

Incidence of Respiratory Distress syndrome, Neonatal hyperbilirubinemia, Transient Tachypnoea, prolonged hospital stays, hypothermia, feeding difficulty has been increased [7], when compared to a term neonate. The reason behind these is physiological immaturity of the baby. The indications of elective Lower Segment Caesarian Section (LSCS) in early term pregnancy can range from unavoidable circumstances such as, previous LSCS in labor, breech in labour, cephalopelvic disproportion to avoidable scenarios such as maternal request of LSCS in view of anxiety or wishing to have their child on an auspicious day. According to a study done by Pirjani, R et al, 28% of women requested for LSCS [8].

A study was undertaken at our institute to audit the early term neonatal short-term outcomes. Though it is impossible to drastically decrease the incidence of early term deliveries as there will be absolute indications making an early term delivery inevitable, we can still try and avoid early term deliveries that are done for maternal request or non-medical and non-emergent indications provided if we establish a relationship between bad outcomes and early term neonates.

## 2. METHODOLOGY

A retrospective descriptive cross-sectional study was carried out between July 2020 and December 2020 at a private medical college neonatal intensive care unit. Neonates with a gestation age of 37 weeks and 0 days to 38

weeks and 6 days born during the above period of 6 months were included. The identity details of the babies were obtained from department database.

Information on maternal age, parity, antenatal risk factors, mode of delivery, resuscitation was obtained from case records. The early neonatal outcomes that were studied included incidence of respiratory distress, hypoglycemia, feeding problems including restricted breastfeeding and tube feedings, neonatal jaundice and duration of hospital stay.

The data was compiled using Microsoft Office 365 Excel and analyzed with Microsoft Excel data analysis tool kit. Qualitative data was presented as frequencies and percentages. Mean, standard deviation, median and interquartile range were used to represent quantitative data.

## 3. RESULTS

A total of 137 early term babies were delivered between July 2020 and December 2020. Table 1 shows maternal characteristics. The mean age of the mother who gave birth to early term neonates was 26.8 years [SD  $\pm$ 4.2]. Hypothyroidism (23%) and gestational diabetes (23%) were found to be the most common antenatal problem. 73% of the deliveries were through LSCS.

Neonatal characteristics are given in Table 2. The mean gestational age of the neonates was 37.4 [SD  $\pm$ 0.5] and mean weight of the neonates was 2822g [SD $\pm$ 471]. Out of 137 neonates 80 [58%] of them were male babies and 57 [42%] of them were female babies. The median value for the time taken for giving the first feed was around 30 minutes with interquartile range of 18-36.

Table 3 shows early neonatal outcomes of the study population. The most common morbidity in early term neonates was neonatal jaundice which affected 91 [66.4%] of the neonates, with mean peak bilirubin value of 14.1mg/dl, followed by respiratory morbidity which affected 38 [28%] of the neonates. None of the babies had feeding problem.

**Table 1. Maternal Characteristics**

<b>Maternal characteristics(n=137)</b>	<b>Frequency (Percentage)</b>
Age, mean (sd)	26.8 (4.2)
Primi, n (%)	63(46)
Multi, n (%)	74(54)
PIH, n(%)	21(15)
GDM, n (%)	31(23)
Hypothyroid, n (%)	32(23)
Mode of delivery	
LSCS, n (%)	100(73)
NVD, n (%)	37(27)

PIH- Pregnancy induced hypertension, GDM - Gestational Diabetes Mellitus, LSCS – Lower Segment Caesarian Section, NVD – Natural Vaginal Delivery, SD – Standard Deviation

**Table 2. Neonatal Characteristics**

<b>Gestational age, mean(SD)</b>	37.4(0.5)
<b>Birth weight, grams, mean(SD)</b>	2822(471)
<b>Male, n(%)</b>	80(58)
<b>Female, n(%)</b>	57(42)
<b>Need for resuscitation, n(%)</b>	8(6)
<b>Positive pressure ventilation, n(%)</b>	8(6)
<b>1 min apgar, mean (SD)</b>	7.5(0.9)
<b>5 min apgar, mean (SD)</b>	8.6(0.6)
<b>First feed initiation, minutes, median(IQR)</b>	30(18-36)

**Table 3. Early Neonatal Outcomes**

<b>Respiratory morbidity, n(%)</b>	38(28)
<b>Hypoglycemia, n(%)</b>	5(3.6)
<b>Hypoglycemia corrected with feeds, n(%)</b>	5(100)
<b>Neonatal jaundice, n(%)</b>	91(66.4)
<b>Maximum bilirubin, mg/dl, median(IQR)</b>	14.1(11-16.3)
<b>Exchange transfusion, n(%)</b>	1(0.7)
<b>Feeding problems, n(%)</b>	Nil
<b>Duration of stay, median (IQR)</b>	7(6-10)

#### 4. DISCUSSION

In our study we aimed to highlight the short term outcomes with early term deliveries and associated risk factors. In our study the mean age of the mothers is 26.8, which is comparatively lower than the study done by Tita ATN et al [9] in which the median age was 30 and is similar to study done by Dilek Ulubaş-Işık et al in which the mean age was 28.2 [10]. According to a study done by Palanivel et al. [11], 73% of the mothers were between the age of 21-30 years. Maternal hypothyroidism (23%), gestational diabetes (GDM) (23%) followed by pregnancy induced hypertension (PIH) (15%) were the antenatal risk factors associated with early term deliveries in our study. These findings are in contrast to the study done by Dilek Ulubaş-Işık et al in where 22% of PIH and 35% of GDM

accounted for early term deliveries [10]. The mode of delivery in our study is 73% via LSCS and 27% by NVD, which implies that early term deliveries are associated with LSCS. Our incidence of LSCS is more than three fourths of total delivery when compared to study done by Sengupta S et al where the frequency of LSCS for early term gestation was 38.4% [12].

According to our study the mean gestational age of the babies is 37.4 weeks and the mean birth weight is 2822 grams which is almost similar to study done by Bulut et al [13] where the mean weight is 3124 grams. This implies that incidence of low birth weight is not that significant in early term according to our study. The frequency of male baby in this study is 58% which is similar to the study done by Dilek Ulubaş-Işık et al [10] in which there was 61 % of male babies. The mean

1-minute APGAR score is 7.5 and 5-minute APGAR score is 8.6 which is lesser when compared to study done by Ozgul Bulut et al where the 1 minute APGAR was 7.9 and 5 minute APGAR was 9.1 [13].

Our study results showed high incidence of respiratory morbidity and neonatal jaundice. The most common adverse outcome was neonatal jaundice which accounted for 66.4% with mean peak bilirubin value of 14.1 mg/dl followed by respiratory morbidity which accounted for 28%. A study done by Ghartey K et al showed that there is 2 fold increase in incidence of respiratory morbidity in early term neonates when compared to term neonates [14] and this fact is also supported by the study done by Thomas J et al [15]. The increase in respiratory morbidity is probably due to decreased clearance of lung fluid which is secondary to delayed pulmonary fluid absorption due to decreased maturity and increased rate of LSCS.

The incidence of neonatal hypoglycemia is 5% which is similar to the study done by Sengupta S et al in which the incidence was 4.9% [12]. In our study population, the low incidence could be due to the practice of first hour feeding. None of the neonates needed intravenous fluids for hypoglycemia correction and correction of feeds along with prescription of pasteurized donor human milk from our human milk bank was sufficient for hypoglycemia correction.

Jaundice is the most common condition requiring medical attention in the neonates. According to a study done by Woodgate P, about 50% of term babies and 80% of preterm babies develop neonatal jaundice. This shows that as the gestational age decreases the incidence of jaundice increases. The incidence of neonatal jaundice in our study is 66.4% which is comparatively higher than the study done by Dilek Ulubaş-Işık et al [10] in which the incidence was 45% which might be due to higher study population. The higher incidence was probably due to decreased feeding ability of early term neonates that is compounded by hepatic immaturity.

The mean duration of hospital stay in our study is 7 which is higher when compared to study done by Ozgul Bulut et al [13], where the mean duration was 4.4. The higher incidence of neonatal jaundice needing phototherapy and respiratory morbidity probably lead on to increase in duration of stay.

## 5. CONCLUSION

Our study is limited by the sample size used and long-term data, which is being done as a follow up project in our unit. This study establishes the high incidence of neonatal jaundice and respiratory morbidities in this population. This will in turn cause maternal anxiety, mother child separation and increased hospital stay. Hence it is better to avoid elective LSCS before 39 weeks of gestation provided there are no medical indications for the same.

## CONSENT

It is not applicable.

## ETHICAL APPROVAL

Institutional Ethical Committee approval was obtained prior to retrieving case records from Hospital Medical Records Department.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Sources: World Health Report: Make Every Mother and Child Count (WHO) and The Lancet's Newborn Survival Series (2005) and UNICEF (2008); 2005.
2. Beck S, Wojdyla D, Say L, Bertran AP, Merialdi M, Requejo JH, et al. The worldwide incidence of preterm birth: a systematic review of maternal morbidity and mortality. *Bull World Health Organ.* 2010;88(1):31–8. DOI:10.2471/BLT.08.062554. Epub 2009 Sep 25.
3. Engle WA. Morbidity and mortality in late preterm and early term newborns: a continuum. *Clin perinatol* 2011;38:493-516.
4. Seikku L, Gissler M, Andersson S, Rahkonen P, Stefanovic V, Tikkanen M, Paavonen J, Rahkonen L. Asphyxia, neurologic morbidity, and perinatal mortality in early-term and postterm birth. *Pediatrics.* 2016;137(6).
5. Sengupta S, Carrion V, Shelton J, Wynn RJ, Ryan RM, Singhal K, Lakshminrusimha S. Adverse neonatal outcomes associated with early-term birth. *JAMA pediatrics.* 2013;167(11):1053-9.

6. Spong CY. Defining "term" pregnancy: recommendations from the Defining "Term" Pregnancy Workgroup. JAMA. 2013;309(23):2445-6. DOI: 10.1001/jama.2013.6235. PMID: 23645117
7. Murray SR, Shenkin SD, McIntosh K, Lim J, Grove B, Pell JP, Norman JE, Stock SJ. Long term cognitive outcomes of early term (37-38 weeks) and late preterm (34-36 weeks) births: A systematic review. Wellcome Open Res. 2017;2:101. DOI: 10.12688/wellcomeopenres.12783.1. PMID: 29387801; PMCID: PMC5721566.
8. Pirjani R, Afrakhteh M, Sepidarkish M. et al. 'Elective caesarean section at 38–39 weeks gestation compared to >39 weeks on neonatal outcomes: a prospective cohort study. BMC Pregnancy Childbirth 2018;18:140. Available: <https://doi.org/10.1186/s12884-018-1785-2>
9. Tita ATN, Jablonski KA, Bailit JL, Grobman WA, Wapner RJ, Reddy UM, Varner MW, Thorp JM Jr, Leveno KJ, Caritis SN, Iams JD, Saade G, Sorokin Y, Rouse DJ, Blackwell SC, Tolosa JE; Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. Neonatal outcomes of elective early-term births after demonstrated fetal lung maturity. Am J Obstet Gynecol. 2018 Sep;219(3):296.e1-296.e8. DOI: 10.1016/j.ajog.2018.05.011. Epub 2018 May 22. PMID: 29800541; PMCID: PMC6143365.
10. Ulubaş-Işık D, Erol S, Demirel N, Kale Y, Çelik İH, Tapısız ÖL, Yırcı B, Baş AY. Early-term delivery and adverse neonatal outcomes at a tertiary center in Turkey. Turkish Journal of Pediatrics. 2015;57(6).
11. Palanivelraja T. Immediate Neonatal Outcomes in Early Term Birth in Tertiary Care Hospital, Tirunelveli Medical College and Hospital (Doctoral dissertation, Tirunelveli Medical College, Tirunelveli).
12. Sengupta S, Carrion V, Shelton J, et al. Adverse Neonatal Outcomes Associated With Early-Term Birth. JAMA Pediatr. 2013;167(11):1053–1059. DOI:10.1001/jamapediatrics.2013.2581
13. Bulut O, Buyukkayhan D. Early term delivery is associated with increased neonatal respiratory morbidity. Pediatrics International. 2021;63:60-64. Available: <https://doi.org/10.1111/ped.14437>
14. Gharvey K, Coletta J, Lizarraga L, Murphy E, Ananth CV, Gyamfi-Bannerman C. Neonatal respiratory morbidity in the early term delivery. Am J Obstet Gynecol. 2012;207(4):292.e1-4. DOI: 10.1016/j.ajog.2012.07.022. Epub 2012 Jul 20. PMID: 22902075.
15. Thomas J, Olukade TO, Naz A, Salama H, Al-Qubaisi M, Al Rifai H, Al-Obaidly S. The neonatal respiratory morbidity associated with early term caesarean section - an emerging pandemic. J Perinat Med. 2021;49(7):767-772. DOI: 10.1515/jpm-2020-0402 PMID: 33962503.

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