IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 17, Issue 10 Ver. 7 (October. 2018), PP 25-29
www.iosrjournals.org

Correlation Between Timing Of Elective Repeat Cesarean Section At Term And Neonatal Outcomes In A Peripheral Tertiary Hospital

Dr. Tamal Kumar Mandal[1] , Dr. Pratima Garain[2] ,
RMO cum Clinical Tutor. Associate Professor.
- Department of Obstetrics and Gynaecology.
Bankura Sammilani Medical College & Hospital, Bankura, West Bengal, India.
Corresponding Author: Dr. Tamal Kumar Mandal

Abstract:
Background: *Births by elective cesarean section (CS) have risen over the last decade worldwide, particularly before 39 weeks' gestation in mothers with previous cesarean deliveries, which may be associated with unacceptably high risk of adverse neonatal outcomes. So the optimal timing of these deliveries needs to be determined with recent recommendations to delay births by elective CS until 39 weeks.*
Aims: *To evaluate the association between the gestational age (GA) at birth and neonatal outcomes after elective repeat CS between 37 and 40 completed weeks, so that timing of elective repeat cesarean section can be mapped out without compromising neonatal and maternal outcomes among the low and middle socio-economic mothers in a peripheral tertiary hospital of West Bengal, India whose outcome was not studied extensively.*
Materials and Methods: *This was a prospective observational comparative study of viable singleton neonates delivered by elective repeat CS at Bankura Sammilani Medical College & Hospital, Bankura, West Bengal, India. During the study period from 1st September 2017 to 31st August 2018 a total of 101 mothers delivered by elective repeat cesarean section at term were stratified into* ***two gestational age groups*** *with* ***early term Group A*** *(between 37weeks, 0day and 38weeks, 6days) compared with the reference group of* ***full term Group B*** *(between 39weeks, 0day and 40weeks, 6days). The neonatal outcomes examined were serious respiratory morbidity (respiratory distress syndrome, Transient tachypnea of new born), depression at birth, neonatal sepsis, nursery admission.*
Results: *Out of 101 elective repeat cesarean deliveries at term, 46.53% were performed between 37weeks, 0day and 38weeks, 6days. 53.46% between 39weeks, 0day and 40weeks, 6days. We found a significant risk in the* ***early term Group A*** *in comparison to the reference group of* ***full term Group B*** *for development of neonatal respiratory complications i.e. respiratory distress syndrome****(RDS) (P=0.031)****, transient tachypnea of new born****(TTN) (P=0.003)****; neonatal sepsis* ***(P=0.031)****, admission in sick newborn care unit* ***(P=0.003)****.*
Conclusion: *Elective repeat CS performed at 37–38 completed weeks is associated with poorer neonatal outcomes compared to those delivered at 39–40 completed weeks. This study supports recent recommendations to delay delivery by elective repeat CS until 39 weeks if possible.*
Keywords*: Previous cesarean delivery, elective repeat cesarean section, neonatal outcomes, respiratory complications.*

Date of Submission: 05-10-2018 Date of acceptance: 20-10-2018

I. Introduction, Review of Literature and Aims & Objectives :

Elective cesarean section i.e. (a delivery performed in the absence of labor or other recognized medical or obstetrical indications for delivery) rates have risen over the last decade worldwide because of increasing maternal age, advanced fetal monitoring, assisted reproductive technology (ART), post cesarean pregnancy, breech delivery and ultimately maternal request. This have the potential for a significant impact on public health and health care costs because of the morbidity associated with this subgroup **(1,2).**

Elective cesarean delivery may be scheduled to accommodate patient and surgeon convenience and there is a risk that it may be performed earlier than is appropriate. Infants born before 39 weeks of gestation are at increased risk for neonatal adverse respiratory outcomes and the risk increases progressively as gestational age at birth declines **(3,4).** As compared with the infants born vaginally, those born by cesarean section are at increased risk for adverse respiratory outcomes, especially when delivery occurs before the onset of labor **(3-6)**. This increased risk persists even in the infants who are delivered by cesarean section at term (i.e. at or beyond 37 completed weeks of gestation).

Human lung development begins at early embryonic life (3-7weeks) and it continues through several stages up to the early childhood. Period of saccular development extends from 24th to 28th weeks. Final developmental of alveolar period extends from 36th weeks to 2 years after birth. The main determinants of extrauterine survival are with two issues. First is formation of surfactant, the phospholipids secreted by the Type II pneumocytes, situated in the pulmonary alveoli. Several hormones and growth factors regulate the surfactant synthesis of which glucocorticosteriod is the most important to accelerate the process. The second important issue is the transition in the mechanics of breathing from intermittent fetal to continuous in neonatal life following the process of birth. Here comes the role of chest wall respiratory muscles and the diaphragm. For effective gas exchange to occur, alveolar spaces must be cleared of excess fluid and pulmonary blood flow must be increased to match ventilation with perfusion. Failure of either of these events can jeopardize neonatal transition and cause the infant to develop respiratory distress- transient tachypnea of new born and hyaline membrane disease **(7)**. The ability of a neonate to self-resuscitate itself at birth after remaining "submerged" in fluid for much of its life is truly remarkable, considering victims of near-drowning faced with similar amounts of fluid in the lungs do so poorly. Bland RD et al, Jain L et al **(8,9)** said that Amiloride-sensitive sodium transport by lung epithelia through epithelial sodium channels (ENaC) has emerged as a key event in the transepithelial movement of alveolar fluid. Canessa CM et al **(10,11)** said indeed, cDNAs that encode amiloride-sensitive sodium channels in other sodium transporting epithelia have also been cloned from airway epithelial cells**.** The lung epithelium is believed to switch from a predominantly chloride secreting membrane at birth to a predominantly sodium absorbing membrane after birth. We are still far from a complete understanding of the mechanisms by which fetal lungs are able to clear themselves of excessive fluid at birth.

The evidenced based management of term pregnancy with a history of previous cesarean section is cesarean delivery but the timing of such delivery at term has been a subject of debate in obstetrics. Obstetricians need to consider several areas while deciding the timing of delivery. The few important issues are:

a) Risk of mother and newborn if the pregnancy continued.

b) The resources available at the place of delivery and even after discharge for such neonates and finally,

c) The benefits of delivery need to be weighed against the risk to the mother or the newborn or the mother and the newborn both. Ultimately the decision of delivery is based on individual woman.

Approximately 40% of the 1.3 million cesarean deliveries performed annually in the United States are repeat procedures and the number of cesarean deliveries continues to rise, so the timing of elective cesarean delivery has increasingly important public health implications **(12,13)**. A major reason for this increase is the decline in the rate of attempted vaginal birth after cesarean delivery **(14)**. Alan T.N. Tita et al **(15)** said that delivery at 37-38 completed weeks as compared with delivery at 39 weeks (for neonatal benefit) is not associated with improved composite adverse maternal outcomes. A composite of severe adverse maternal outcomes only that included maternal death, uterine rupture or need for hysterectomy was also not decreased by earlier delivery compared with elective delivery at 39 weeks. Tita et al **(15)** also noticed those elective repeat cesareans before 39 weeks of gestation are common and are associated with respiratory and other adverse neonatal outcomes. Early elective delivery was associated with a 2-fold increased frequency of maternal hospitalization for 5 days or more, as compared to elective delivery at 39 weeks. Additional analyses suggested that this increase in prolonged maternal hospital stay may be more attributable to prolonged neonatal hospitalization (women remain longer in the hospital because of their babies) than to increased maternal morbidity.

With the recent trend of increasing elective repeat CS rates, it is important to confirm and quantify the impact on neonatal outcomes. The aim of this study was to report the effect of the timing of elective repeat CS deliveries at term on neonatal outcomes. The results will provide further evidence to guide the policy on the optimal timing of these deliveries.

II. Materials & Methods

A prospective observational comparative study was carried out in the department of Obstetrics & Gynaecology in Bankura Sammilani Medical College & Hospital, Bankura, West Bengal, India from 1st September 2017 – 31st August 2018. During the study period the mothers with gestational age between 37 weeks, 0days to 40weeks, 6days with a history of one previous cesarean section; not in labor, without scar tenderness, with Hb % ≥ 10 gm%, haemodynamically stable(normal maternal pulse rate & BP) with a singleton live fetus in cephalic presentation without any congenital anomaly with adequate liquor were included in the study. Patients with gestational age <37 weeks, 0day and >40weeks, 6days, more than one previous cesarean sections, with scar tenderness, multifoetal pregnancy, malpresentation, scanty liquor, IUGR, IUFD , Antepartum haemorrhage, Hb% < 10 gm%, haemodynamically unstable(maternal tachycardia, low or high BP), PIH, heart disease, chronic renal disease, liver disease were excluded. All the mothers were assessed by history, clinical examination and ultrasonography for fetal maturity. Data about socio-demographic variables, detailed

obstetrical history, indications for caesarean section were collected in data sheet. Gestational age was determined by treating surgeons with the use of standard criteria **(16)** that took into consideration the clinical history and the results of the earliest ultrasound examination. If the findings on ultrasound examination were consistent with a gestational age based on first date of the last menstrual period, gestational age was determined according to the date of the last menstrual period; if the date of the last menstrual period was uncertain or the findings on ultrasound examination were inconsistent with a gestational age based on the date of the last menstrual period, gestational age was determined according to the results of the ultrasound examination**.** Decision about the timing of cesarean delivery was taken by the respective treating surgeons. Where a conservative approach was taken till an optimum gestational age the mothers were followed up by daily clinical monitoring (maternal pulse rate, BP, pallor & uterine contraction, scar tenderness), daily fetal movement count, twice in a week CTG, routine USG for fetoplacental profile, liquor volume (AFI) and umbilical artery doppler study every after two weeks. Ethical clearance was obtained from College Ethical Committee. Appropriate written consent was taken from the pregnant women and relatives. Data sheets were given to the SNCU and to the operation theatre (OT). All cesarean deliveries were conducted by experienced resident surgeons. After the delivery of the baby, in operation theatre- indication of elective caesarean section, Apgar score at 1 and 5 minutes, resuscitation needed or not, birth weight, need of SNCU admission were documented by resident doctors and submitted to the OT sister-in -charge. Subsequent neonatal outcomes had been documented until the baby was discharged. All the pregnant mothers fulfilling the inclusion criteria were stratified into **two gestational age groups** with **early term Group A** (between 37weeks, 0day and 38weeks, 6days) compared with the reference group of **full term Group B** (between 39weeks, 0day and 40weeks, 6days).

Collected data was put into Microsoft excel version 7 (Microsoft Corporation, Redmond, WA, USA) and analysed by Epi Info version 3.5.1 Software (Centers for Disease Control and Prevention, Atlanta, USA). Categorical data was described as frequency and percentage. The chi-square ($\chi 2$) test was performed to compare categorical data. $P < 0.05$ was considered as statistically significant.

III. Observation & Discussion

In this study, total 101 antenatal mothers with previous one cesarean section with 37 to 40 completed weeks of gestational age were selected for elective cesarean section.

About 46.53% (47/101) cesarean section was done between 37weeks, 0day and 38weeks, 6days i.e at **early term** and 53.46% (54/101) in between 39weeks, 0day and 40weeks, 6days i.e at **full term (table1, figure1)** and this is supported by Tita et al. **(15)** who showed that 35.8% of cesarean section was performed before 39 completed weeks of gestation and 49.1% at 39 weeks of gestation.

Table 1: Distribution of mothers according to gestational age.

Gestational age	No of mothers	Percentage(%)
Group A	47	46.53
Group B	54	53.46

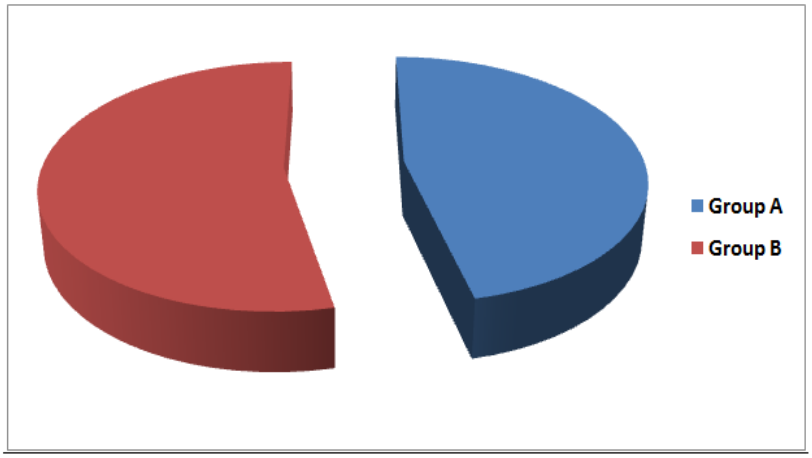

Figure 1: Pie diagram showing distribution of mothers according to Gestational age

We found that there was significantly higher risk in the early cesarean group **(early term Group A)** of various neonatal outcomes including respiratory complications. In the early cesareans group the respiratory complications are statistically significant, manifested most often as respiratory distress syndrome**(85.7%)(P=0.031)**, transient tachypnea of the newborn **(84.6%)(P= 0.003)** and this risk decreased as advancing the gestational age **(table2, figure2)** that is in line with those found by Tita et al **(15)**, Signore et al **(17)**, Wilmink et al **(18),** Levine EM et al **(6)**, Van den Berg A et al **(19)**.

Table 2 : showing different neonatal outcomes between two groups

Parameters	GroupA (%)	GroupB (%)	Total (%)	Chi-square P value
1. TTN:				
Yes	11(84.6)	2(15.4)	13(100)	
No	36(40.9)	52(59.1)	88(100)	0.003
2. Apgar score at 5 minutes :				
< 7 at 5 min	5(71.40)	2(28.60)	7(100)	0.171
≥ 7 at 5 min	42(44.70)	52(55.30)	94(100)	
3. Birth asphyxia:				
Yes	5(62.5)	3(37.5)	8(100)	0.346
No	42(45.2)	51(54.8)	93(100)	
4. SNCU admission :				
Yes	11(84.65)	2(15.40)	13(100)	0.003
No	36(40.90)	52(59.10)	88(100)	
5. RDS:				
Yes	6(85.7)	1(14.3)	7(100)	0.031
No	41(43.6)	53(56.4)	94(100)	
6. Neonatal sepsis:				
Yes	9(81.8)	2(18.2)	11(100)	0.013
No	38(42.7)	52(57.3)	90(100)	

TTN= Transient tachypnea of newborn; SNCU= Sick newborn care unit; RDS= Respiratory distress syndrome.

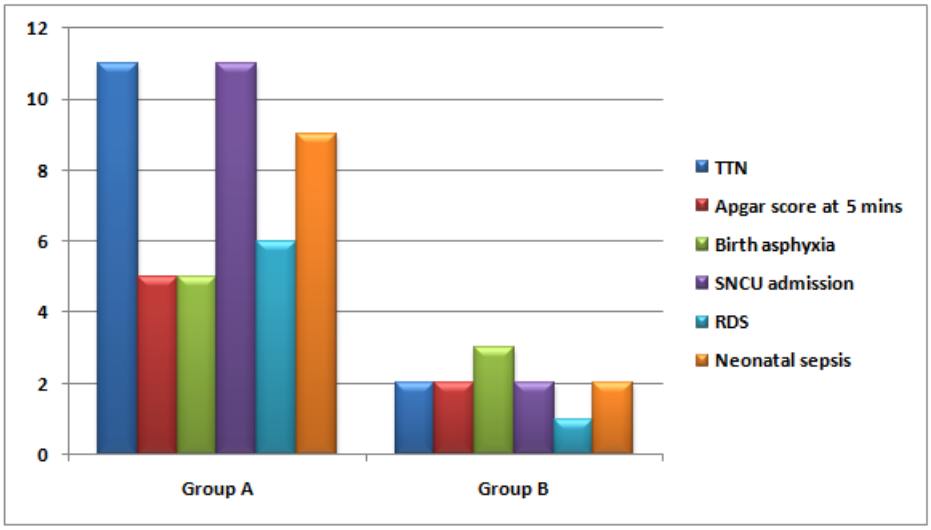

Figure 2 : showing different neonatal outcomes between two groups

Our data did not find any difference in apgar score at 5 minutes (P=0.171) or birth asphyxia (P=0.345) between early and late cesareans. In this study we found a very significant association between early cesareans group and neonatal sepsis **(81.8%)(P=0.013)** and subsequent admission in sick newborn care unit **(84.65%)(P=0.003).** This is also supported by Wilmink et al **(18)**.

IV. Conclusion

This study focuses the light on a new dark corner of neonatal morbidities secondary to unjustified early elective repeat cesarean section. Conversely a significant reduction in the neonatal morbidities may be obtained if the timing of planned elective repeat cesarean section postponed till or beyond 39 weeks of gestation if possible. It seems to be the first logical step in reducing iatrogenic prematurity and excess risk of respiratory distress in newborns. Of course thanks to the presence of a sick newborn care unit nearby.

References

[1]. Ramachandrappa A, Jain L. Elective cesarean section: its impact on neonatal respiratory outcome. Clin Perinatol 2008; 35: 373–393, vii.
[2]. Martin JA, Hamilton BE, Ventura SJ et al. Births: final data for 2009. Natl Vital Stat Rep 2011; 60: 1–70.
[3]. Morrison JJ, Rennie JM, Milton PJ. Neonatal respiratory morbidity and mode of delivery at term: influence of timing of elective caesarean section. Br J Obstet Gynaecol 1995;102:101-6.
[4]. Zanardo V, Simbi AK, Franzoi M, Soldà G, Salvadori A, Trevisanuto D. Neonatal respiratory morbidity risk and mode of delivery at term: influence of timing of elective caesarean delivery. Acta Paediatr 2004;93:643-7.
[5]. Richardson BS, Czikk MJ, daSilva O, Natale R. The impact of labor at term on measures of neonatal outcome. Am J Obstet Gynecol 2005;192:219-26.
[6]. Levine EM, Ghai V, Barton JJ, Strom CM. Mode of delivery and risk of respiratory diseases in newborns. Obstet Gynecol 2001;97:439-42.
[7]. Jain L, Eaton DC. Alveolar fluid transport: a changing paradigm. Am J Physiol Lung Cell Mol Physiol 2006;290:L646. [PubMed: 16531565]
[8]. Bland RD. Loss of liquid from the lung lumen in labor: more than a simple "squeeze". Am J Physiol Lung Cell Mol Physiol 2001;280:L602. [PubMed: 11237999]
[9]. Jain L, Chen XJ, Ramosevac S, et al. Expression of highly selective sodium channels in alveolar type II cells is determined by culture conditions. Am J Physiol Lung Cell Mol Physiol 2001;280:L646. [PubMed: 11238004]
[10]. Canessa CM, Horisberger JD, Rossier BC. Epithelial sodium channel related to proteins involved in neurodegeneration [see comments]. Nature 1993;361:467. [PubMed: 8381523]
[11]. Canessa CM, Schild L, Buell G, et al. Amiloride-sensitive epithelial Na+ channel is made of three homologous subunits. Nature 1994;367:463. [PubMed: 8107805]
[12]. Menacker F. Trends in cesarean rates for first births and repeat cesarean rates for low-risk women: United States, 1990- 2003. Natl Vital Stat Rep 2005;54(4):1-8.
[13]. Menacker F, Declercq E, Macdorman MF. Cesarean delivery: background, trends, and epidemiology. Semin Perinatol 2006; 30:235-41.
[14]. Gregory KD, Curtin SC, Taffel SM, Notzon FC. Changes in indications for cesarean delivery: United States, 1985 and 1994. Am J Public Health 1998;88:1384-7.
[15]. Tita ATN, Landon MB, Spong CY. et al. Timing of Elective Repeat Cesarean Delivery at Term and Neonatal Outcomes. N Engl J Med 2009; 360:111-120.
[16]. American Academy of Pediatrics, American College of Obstetricians and Gynecologists. Guidelines for perinatal care. 6th ed. Elk Grove Village, IL: American Academy of Pediatrics, 2007.
[17]. Signore C, Klebanoff M. Neonatal Morbidity and Mortality after Elective Cesarean Delivery. Clin Perinatol 2008; 35: 361–371.
[18]. Wilmink FA, Hukkelhoven CWPM, Lunshof S, et al. Neonatal outcome following elective cesarean section beyond 37 weeks of gestation: a 7-year retrospective analysis of a national registry. Am JGynecol Obstet 2010; 250: 1-8.
[19]. Van den Berg A, van Elburg RM, Van Geijn HP, Fetter WP. Neonatal respiratory morbidity following elective cesarean section in term infants: a 5-year retrospective study and a review of the literature. Eur J Obstet Gynecol Reprod Biol 2001; 98:9-13.

Dr. Tamal Kumar Mandal. "Correlation Between Timing Of Elective Repeat Cesarean Section At Term And Neonatal Outcomes In A Peripheral Tertiary Hospital" IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 17, no. 10, 2018, pp 25-29.