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COMPARATIVE STUDY OF PERINATAL OUTCOME IN ELECTIVE CESAREAN DELIVERY AT 38 WEEKS GESTATION FOLLOWING A COURSE OF CORTICOSTEROIDS VERSUS ELECTIVE CESAREAN DELIVERY AT 39 WEEKS

Gynaecology

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ABSTRACT

Introduction: British and American societies in obstetrics recommend elective cesarean section to be scheduled after 39 completed weeks of gestation[1,2]. However, approximately 16.5% of women, go into labor during the 38th gestational week, which then requires an emergency cesarean before the scheduled date, giving rise to increased maternal and fetal morbidity[6]. Planning cesarean sections at 38 weeks would, therefore, enable these complications to be reduced, albeit at the risk of neonatal respiratory distress syndrome (RDS) and transient tachypnoea of the newborn (TTN)[7].

Materials and method : This is a retrospective study in which data were collected from the records during two months(June and July 2019). Data from 25 women in each group were collected. The primary outcome was the rate of admission to the neonatal intensive care unit for respiratory distress.

Result: 1 baby (4%) from each group was admitted in NICU for respiratory distress. No significant difference were found in the incidence of neonatal sepsis, and neonatal intensive care unit stays between the two groups.

Conclusion: This pilot study suggests that planning an elective repeat cesarean delivery at 38 weeks gestational age with prior steroid dose prevents complications of emergency cesarean delivery and other complications like uterine rupture, fetal distress.

KEYWORDS

cesarean delivery , neonate, transient tachypnoea of newborn, respiratory distress syndrome, neonatal intensive care unit , neonatal sepsis.

INTRODUCTION:

British and American societies in obstetrics recommend elective cesarean section to be scheduled after 39 completed weeks of gestation[1, 2]. This recommendation is based on a subset of several observational studies suggesting a strong association between earlier gestational age at elective cesarean delivery and risk of respiratory morbidity[3-5]. Approximately 16.5% of women, however, go into labor during the 38th gestational week, which then requires an emergency cesarean before the scheduled date, giving rise to increased maternal and fetal morbidity[6]. Planning cesarean sections at 38 weeks would, therefore, enable these complications to be reduced, albeit at the risk of neonatal respiratory distress syndrome (RDS) and transient tachypnoea of the newborn (TTN)[7].

The utility of corticosteroid treatment in reducing the incidence of respiratory distress was demonstrated some time ago for prematurity before 34 weeks and even 37 weeks[7]. In addition, two recent, large cohort studies investigated the timing of elective cesarean section and the incidence of a composite adverse neonatal outcome including neonatal death or any of a series of adverse events. Both showed a decreasing incidence of the composite outcome with increasing gestational age from 37 to 39 completed weeks of gestation. In contrast, any maternal benefit of postponing elective cesarean section to 39 completed weeks has not been shown, but knowledge is sparse when it comes to maternal consequences of elective cesarean section timing[8, 9]. The appropriate gestational age for scheduled cesarean section (CS) has become a topic of interest in prenatal care[10]. For the past four decades, obstetricians and pediatricians, assuming that fetal maturity could be completed at the end of 37 gestational weeks, have defined “the term pregnancy” from that time onwards[11]. However, it has now become clear that even in “the term pregnancy” (37 gestational weeks), neonatal respiratory complications will decrease with an increase in the gestational age to 39 weeks. These findings have challenged the old definition of “the term pregnancy”[12]. Recently , the definition of "the term pregnancy" has changed to cover three categories of an early-term (37 0/7–38 6/7 days), full-term (39 0/7 –40 6/7 days), and late-term (41 0/7 - 41 6/7 days)[13].

Experts recommend that elective cesarean delivery be conducted from 39 weeks onwards so that fetal maturity is complete[14]. Some studies have shown discrepancies in respiratory complications according to the gestational age pattern between Asian and Caucasian ethnicities. The lowest complication rate was observed in 39 gestational weeks in the Caucasians and in 38 gestational weeks in Asians[10]. In developing countries like India where the transport facilities may not be available for patients with post-cesarean pregnancy in labor to reach the hospital in time, pregnant women with 38 weeks may be advised admissions and planned for cesarean section with coverage of maternal steroids for lung maturity. This reduces complications like rupture uterus, PROM leading to ascending infections, etc. accordingly, this study aimed to compare perinatal outcomes in an elective cesarean section at 38 weeks with a course of steroid versus elective cesarean section at 39 weeks.

AIMS & OBJECTIVES:

The objective of the study is to compare perinatal outcome in elective repeat cesarean delivery at 38weeks gestation following a course of steroid versus elective repeat cesarean delivery at 39 weeks.

MATERIALS AND METHODS:

Study design:

This is a retrospective study in which women were divided into two groups

1) Elective repeat cesarean delivery at 38 gestational weeks following a course of corticosteroids (test group)
2) Elective repeat cesarean delivery at 39 weeks(control group)

Participants: Data were collected from the records regarding the two groups. Data from 25 women in each group were collected.

Inclusion criteria: The gestational age was confirmed by patient's first-trimester scan. Post cesarean women with a singleton pregnancy with 38 weeks and 39 weeks in cephalic and breech presentation are included in the study.

Exclusion criteria:

- Twin pregnancy
- Pre-eclampsia
- Rh isoimmunisation
- Chorioamnionitis
- Chronic fetal distress

- Positive HIV serology
- Previous injection of corticosteroids during pregnancy

Group 1: Elective repeat cesarean delivery was done 24 hrs after and within one week after completion of two doses of 12 mg betamethasone 24hrs apart.

Group 2: Elective repeat cesarean delivery at 39 weeks

Cesarean delivery was performed following a homogeneous regional protocol, based on the surgical technique of Misgav-Ladach or Pfannenstiel for women with previous cesarean delivery. Antibiotic prophylaxis with a second-generation cephalosporin was routinely given. Spinal anesthesia was given for all the cesarean deliveries.

OUTCOMES:

The collected data were maternal age, parity, neonatal weight, and neonatal complications. The following criteria were considered to evaluate the neonatal outcomes:

- Transient tachypnea of the newborn (TTN) defined as the presence of tachypnea within hours after birth;
- Respiratory distress syndrome (RDS) defined as the signs of respiratory distress (radiological features and oxygen therapy),
- Sepsis,
- NICU stay, and

- Apgar scores at 1 and 5 minutes of birth.

REVIEW OF LITERATURE:

Terada et al. examined 1951 cases of elective cesarean delivery in Japan and reported that elective cesarean should be performed at 38 weeks and two days or later in order to avoid respiratory complications[15].

In a study of 442,596 South Asian and Black women, Balchin et al. found that the rate of respiratory dysfunction was the lowest in white infants whose mothers underwent C-section after 39 gestational weeks and in South Asian infants whose mothers underwent C-section at 38 gestational weeks[16].

Phaloprakarn et al. in a retrospective study of 1221 singleton pregnant women in Taiwan and Southeast Asia with scheduled cesarean delivery at 38 gestational weeks compared to 39 weeks revealed no statistically significant difference in severe neonatal complications including TTNB, RDS, and NICU admission[10].

Wilmink et al. reported that more than 50% of the elective cesarean sections were done before 39 gestational weeks in the Netherlands 8.3% at 37 gestational weeks and 48.3% at 38 gestational weeks[17].

Zanardo V. et al. reported that about 60% of elective cesarean sections in their hospital were performed before 38 weeks and 6 days. It seems that physicians, regardless of the existing documents, perform a large percentage of CS deliveries before 39 gestational weeks. It may be due to the physician's opinion or practice patterns, maternal request for early CS, birth certificate data, or any other reason[18].

Christopher J. Robinson et al. reported that waiting until 39 gestational weeks to perform an elective CS is cost-effective[19]. However, the likelihood of emergency cesarean delivery and its maternal complications should also be taken into account. As suggested by some studies, the mean gestational age in Asian and black populations is less than the whites, which can be due to fetal prematurity[20]. An emergency cesarean can be followed by complications for mothers and infants[21]

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Stutchfield has also shown that administering corticosteroids prior to an elective term cesarean section halved (from 5.0% to 2.4%) the number of neonatology admissions for respiratory distress, namely by reducing the rates of RDS and TTN.[22]

Statistical analysis:

Maternal, Obstetrical & Fetal characteristics

Maternal characteristics	Test Group (n=25)	Control Group (n=25)
Maternal Age	23.72 +/- 2.85	23.84 +/- 2.74
Parity		
Primiparous	22 (88%)	22 (88%)
Multiparous	3 (12%)	3 (12%)

Obstetrical characteristics	Test Group (n=25)	Control Group (n=25)	Test Criterion	P-Value
Previous caesarean deliveries			0.355	0.552
1	24	23		
2	1	2		
Complications during pregnancy				
During 1st Trimester				
Present	0	0		
Absent	25	25		
During 2nd Trimester				
Present (uti)	2 (8%)	2 (8%)		
Absent	23 (92%)	23 (92%)		
During 3rd Trimester			2.08	0.149
Present (uti)	2	0		
Absent	23	25		
Hypothyroidism			0.166	0.684
Present	4 (16%)	3 (12%)		
Absent	21 (84%)	22 (88%)		
Pregnancy induced Hypertension			1.02	0.312
Present	1 (4%)	0 (0%)		
Absent	24 (96%)	25 (100%)		

Neonatal Characteristics	Test Group (n=25)	Control Group (n=25)	Test Criterion	P-Value
Sex			0.325	0.569
Male	12 (48%)	10 (40%)		
Female	13 (52%)	15 (60%)		
Birth Weight (Grams)	3.03 +/- 0.26	3.17 +/- 0.23	1.94	0.582
APGAR Score				
At 1 Minute (with '7')	25 (100%)	25 (100%)		
At 5 Minutes (with '9')	25 (100%)	25 (100%)		
Complications in new born			0.355	0.552
TTNB	0	1 (4%)		
Respiratory distress	1(4%)	1(4%)		
Absent	24 (96%)	23 (92%)		
Presentation			0.222	0.637
Cephalic	22 (88%)	23 (92%)		
Breech	3 (12%)	2 (8%)		
NICU Stay				
Admitted	1 (4%)	1 (4%)		
Not admitted	24 (96%)	24 (96%)		

RESULTS:

25 patients were taken in the corticosteroid group(test group), and 25 patients were taken in the control group. In total, one newborn infant out of the 25 (4.0%) in the corticosteroid group(test group) and 1 out of the 25 (4%) in the control group were admitted to neonatal intensive care because of respiratory distress. Respiratory distress in the control group for which there is NICU admission was found to have meconium-stained liquor during surgery. Peri- and postoperative complications, as well as the type of anesthesia, were similar in both groups.

The mean ± (SD) age of the mothers who delivered between 38 to 39 gestational weeks was 23.72+/- 2.85, and the mean SD of mothers who delivered at > 39 weeks is 23.84+/-2.74. The frequency of breech presentation was 12% and 8 % in test group and control group respectively . Percentage of complications like respiratory distress and meconium-stained liquor and TTNB was 4% in the test group and 8% in the control group. In the APGAR score, there is no statistical difference. No significant differences were found in the incidence of neonatal sepsis, and neonatal intensive care unit stays between the two groups.

DISCUSSION:

In this study, respiratory morbidity of the newborn is comparable in both the groups, i.e., Elective repeat cesarean delivery at 38 weeks after a course of steroid and Elective repeat cesarean delivery at 39 completed weeks without steroids. Moreover, this strategy enabled a

significant reduction in the number of emergency caesareans performed before the scheduled date. Since this was a pilot study, however, it lacked the statistical power to indicate significance.

Other authors such as Glavind et al., in a recent randomized study, have failed to find any significant difference in terms of respiratory distress for elective cesarean section at 38 gestational weeks rather than 39 weeks. Their neonatal intensive care unit admissions were, 13.9% and 11.9% respectively, were however much higher than ours[14]

By planning elective cesarean sections a week earlier, there is a drop in the number of caesareans performed before the scheduled date[23] . It is widely recognized, however, that caesareans performed as emergencies are prone to greater fetomaternal morbidity than elective cesarean sections

For elective cesarean section before 39 gestational weeks, the RCOG recommends administering a course of corticosteroids[24]. Hypotheses advanced to account for the various corticosteroid modes of action are based on surfactant production and stimulation of the sodium channels in the pulmonary epithelium, leading to resorption of pulmonary fluid at the epithelial level[25]. The neurological risks of early and late postnatal corticosteroid therapy administered for respiratory outcomes to premature newborn infants are well known. Antenatal use of corticosteroids raises the issue of their long-term safety for the newborn. Nonetheless, data in the literature concerning the long-term effects of antenatal corticosteroid therapy, mostly assessed in prematurely born infants, are reassuring[32,33]

In the literature, caesareans performed as emergencies during labor are responsible for higher maternal morbidity than elective caesareans (16.3% versus 7.0%, $p < 0.001$), with a greater risk of puerperal fever and operative wound infection in particular[26]. Emergency caesareans performed on the night-shift also appear to have a longer net operative time, a longer time for induction of anesthesia and increased maternal morbidity compared to emergency caesareans performed during the day[27]. With regard to fetal morbidity, an increase in respiratory morbidity and a greater number of admissions to the intensive care unit have been observed for emergency versus elective caesareans[28]. Lastly, accidental fetal injuries also appear to be more common when emergency caesareans are performed during labor[29].

One of the benefits of scheduled cesarean delivery at 38 gestational weeks is the prevention of unexpected fetal death. In our study, there are no unexpected fetal deaths in either group. The risk of unexplained stillbirth at 38 gestational weeks was reported to be about 0.05 per 1000 births among women with the history of cesarean delivery in a Scottish and a Canadian cohort study[30, 31]. Meconium aspiration syndrome is one of the most common causes of neonatal morbidity, which leads to various sequelae, and therefore, it is essential to identify the risk factors in order to prevent the poor outcome. One in every seven pregnancies ends with meconium-stained amniotic fluid (MSAF). MSAF can be harmful to the newborn with short and long-term sequelae. In utero gasping and deep breathing, which occurs with sustained hypoxia predispose to MSAF and aspiration of meconium[34]. Meconium staining of the amniotic fluid (MSAF) occurs in around 4% of deliveries before 37 weeks, 10 - 20% of term deliveries, and up to 30 - 40% of post-term deliveries[35].

CONCLUSION:

This pilot study suggests that planning an elective repeat cesarean delivery at 38 weeks gestational age with prior steroid dose prevents complications of emergency cesarean delivery and other complications like uterine rupture, fetal distress.

In developing countries like India where the transport facilities in rural areas are meager, admitting the patient at 38 weeks and providing steroid dose and planning cesarean section helps in preventing untoward complications as the results in both the groups show no variation. Studies with a larger number of women are required in order to be able to confirm these findings.

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