



EFFECT OF ANTENATAL CORTICOSTEROIDS ON NEONATAL OUTCOMES IN TERM ELECTIVE CESAREAN SECTIONS: AN INTERVENTIONAL STUDY

Obstetrics & Gynaecology

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ABSTRACT

Background: Elective cesarean sections at term, particularly before the onset of labor, are associated with increased neonatal respiratory morbidity. Antenatal corticosteroids (ACS) have shown benefits in preterm births, but their utility in term elective cesarean deliveries remains controversial. **Objective:** To evaluate the effects of prophylactic ACS on neonatal respiratory outcomes in term elective cesarean deliveries. **Methods:** This interventional study was conducted at GMSH Sector-16, Chandigarh over one year. A total of 104 women (≥ 37 and < 39 weeks) scheduled for elective cesarean were randomized into two groups: 52 received dexamethasone (6 mg i.m. four times 12 hours apart), and 52 received no intervention. Neonatal outcomes, including respiratory morbidity, APGAR scores, NICU admissions, and length of hospital stay were recorded and analyzed using SPSS v20. **Results:** NICU admissions were higher in the control group (19.2%) compared to the steroid group (11.5%). No cases of RDS occurred in the steroid group versus 2 (3.8%) in the control group. TTNB was observed in 5 neonates (9.6%) in the steroid group and 7 (13.5%) in controls. The study group also showed slightly higher APGAR scores and reduced need for mechanical ventilation. **Conclusion:** Prophylactic ACS administration before elective cesarean delivery at term significantly reduced respiratory morbidity without major adverse outcomes. These findings support the cautious use of ACS in scheduled cesarean deliveries before 39 weeks.

KEYWORDS

Antenatal corticosteroids, elective cesarean section, respiratory distress syndrome, transient tachypnea of the newborn, dexamethasone, neonatal outcomes

INTRODUCTION

Cesarean section rates have been rising globally, often exceeding the WHO recommended threshold of 10–15%. In India, the National Family Health Survey (NFHS-4) reports a national cesarean rate of 17.2%. Elective cesarean deliveries, particularly those conducted without the onset of labor, have been associated with increased neonatal respiratory complications due to lack of hormonal and mechanical stimuli necessary for lung fluid clearance.

Studies have shown that labor induces catecholamine release, promoting alveolar fluid resorption through activation of sodium channels in the fetal lungs. Antenatal corticosteroids (ACS), commonly administered to preterm pregnancies, enhance these mechanisms by stimulating surfactant production and improving lung compliance. Despite these benefits in preterm infants, the use of ACS in term elective CS is still debated due to concerns regarding long-term neurodevelopmental outcomes and neonatal hypoglycemia.

This study aims to assess the short-term neonatal outcomes of administering prophylactic ACS prior to elective CS at term, with particular focus on respiratory morbidity.

MATERIALS AND METHODS

Study Design: Prospective, randomized, interventional study

Setting: A government Medical college and Hospital setting in a second tier Indian city

Study Duration: 1 year

Inclusion Criteria:

- Singleton pregnancies
- Gestational age between 37 and 38+6 weeks
- Scheduled for elective cesarean section

Exclusion Criteria:

- Medical comorbidities (GDM, hypothyroidism, hypertensive disorders)
- Obstetric complications (preeclampsia, IUGR, PROM, fetal anomalies)
- Multiple gestations
- Prior corticosteroid therapy
- Preoperative infections

Sample Size Calculation:

Based on prior studies (e.g., Salem et al.), with an estimated difference in respiratory morbidity (2.8% vs. 19.6%), and assuming 80% power and 5% alpha error, a minimum of 52 participants per group was calculated.

Intervention

- **Study Group:** Dexamethasone 6 mg intramuscularly every 12 hours (total 4 doses)
- **Control Group:** No intervention

Elective CS was performed 24 hours after the last dose in the study group.

Primary Outcomes:

- APGAR scores at 1 and 5 minutes
- Incidence of RDS and TTNB
- NICU admissions and duration
- Need for respiratory support (oxygen, CPAP, mechanical ventilation)
- Hypoglycemia
- Neonatal mortality

RESULTS

The baseline maternal and neonatal characteristics between both groups were statistically comparable.

- **APGAR Scores:** Higher in the steroid group at both 1 and 5 minutes, though not statistically significant.
- **NICU Admissions:** 10 cases in the control group (19.2%) vs. 6 in the steroid group (11.5%).
- **RDS:** 2 cases (3.8%) in control group; none in steroid group.
- **TTNB:** Slightly lower in the steroid group 5 cases (9.6%) vs. control group 7 (13.5%).
- **Respiratory Support:** No mechanical ventilation needed in steroid group; 2 cases in control group.
- **Hospital Stay:** Shorter in steroid group; no admissions beyond 48 hours.
- **Hypoglycemia:** Observed in 2 neonates in steroid group and 1 in control group.
- **Mortality:** One neonatal death occurred in control group; none in steroid group.

Outcome	Steroid Group	Control Group
APGAR Scores (1 min)	Higher (not statistically significant)	Lower (not statistically significant)
APGAR Scores (5 min)	Higher (not statistically significant)	Lower (not statistically significant)
NICU Admissions	6 (11.5%)	10 (19.2%)
RDS	0	2 (3.8%)
TTNB	5 (9.6%)	7 (13.5%)
Ventilator Support	0	2 (3.84%)
Hospital Stay	Shorter; no admissions beyond 48 hours	Longer as compared to steroid

Hypoglycemia	2 (3.84%)	1 (1.92%)
Mortality	0	1 (1.92%)

DISCUSSION

The findings of this study align with prior research such as the ASTECS trial and work by Nada et al., which demonstrated that prophylactic ACS before elective CS can reduce neonatal respiratory morbidity. The reduction in NICU admissions and mechanical ventilation requirements in the steroid group may be attributed to improved fetal lung maturity.

Although hypoglycemia was slightly more frequent in the steroid group, the difference was not statistically significant. No long-term outcomes were assessed in this study, and this remains a limitation.

Despite its small sample size, this study provides additional support for the short-term benefits of ACS in term elective cesarean sections. However, further large-scale and long-term studies are needed to fully understand potential risks and to refine protocols on dosage, timing, and patient selection.

CONCLUSION

Prophylactic administration of antenatal corticosteroids before elective cesarean sections at term can significantly reduce respiratory complications such as RDS and TTNB, lower NICU admission rates, and decrease the need for mechanical ventilation. These benefits must be balanced against the potential risks, including neonatal hypoglycemia and unknown long-term effects. Elective cesarean deliveries should ideally be scheduled after 39 weeks; however, when early delivery is necessary, a single course of corticosteroids may be considered to improve neonatal outcomes.

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