



FULL LENGTH ARTICLE

The neonatal respiratory outcome in relation to timing of elective cesarean section at 38 versus 39 week gestation: A single center based study[☆]

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Received 18 April 2013; revised 4 June 2013; accepted 26 June 2013

Available online 20 August 2013

KEYWORDS

Respiratory morbidity;
Elective;
Cesarean section;
Timing;
Term neonates

Abstract *Background:* Cesarean delivery per se is a risk factor of respiratory morbidity in term neonates and its timing is an adding factor of increased rates of respiratory complications.

Objective: We aimed to identify the association between elective cesarean delivery at 38 versus 39 week gestation and neonatal respiratory morbidity.

Materials and methods: We selected 200 pregnant women who underwent elective cesarean delivery at 38 or 39 week gestation at the Kasr El-Aini hospital. Mothers were subjected to ultrasound examination. Neonates with respiratory distress were subjected to laboratory investigations and chest X-ray.

Results: We found no association between the development of any type of respiratory distress and maternal age or parity. The prevalence of respiratory morbidity was 25% in group A compared to 11% in group B ($p = 0.01$) and risk estimation showed that delivery at 38 weeks carries 2.7 time risk of having a newborn suffering from respiratory morbidity (95% CI: 1.2–5.8). TTN was observed in 11% of group A compared to 7% of newborns of group B ($p = 0.6$). RDS developed in 3 cases of

[☆] This work was carried out at Obstetrics & Gynecology hospital, Kasr El-Aini School of medicine, Cairo University, Cairo, Egypt.

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Peer review under responsibility of The Egyptian Pediatric Association.



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group A, while none of group B developed RDS ($p = 0.1$). The rate of NICU admission, mechanical ventilation in the 1st 24 h and long hospital stay were insignificantly higher in group A ($p > 0.05$). There were no neonatal deaths in both groups.

Conclusion: Elective cesarean delivery at 39 week gestation is associated with a better neonatal respiratory outcome. Further studies are recommended to identify the best time of elective cesarean delivery associated with the least neonatal and maternal morbidity.

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Introduction

Cesarean section is common and rates are increasing over time in all developed and many developing countries. Adverse health outcomes after cesarean delivery are well documented for a woman and her newborn infant [1]. In the neonates, these adverse events include neonatal respiratory morbidity, hypoglycemia, sepsis, neonatal intensive care unit (NICU) admissions, and hospitalization ≥ 5 days [2]. Neonatal respiratory morbidity which presents clinically as respiratory distress is a common health problem, occurring in up to 7% of newborn infants and results in a significant increase in numbers of term-born infants being admitted to neonatal units [3].

Not only the mode of delivery but also its timing can affect the neonatal outcomes. In general, neonatal outcomes at 37 and 38 weeks are very similar to (or worse than) those at 41 and 42 weeks with best outcomes occur at 39 and 40 weeks. It was reported that neonatal respiratory morbidity associated with elective cesarean delivery at term increases as gestational age at delivery decreases from 39 to 37 weeks [4,5]. Therefore, elective deliveries prior to 39 weeks are discouraged to minimize prematurity-related neonatal complications [6].

In Egypt, like many other developing countries, no reports are available to confirm or oppose this hypothesis. In this study we aimed to assess the association between elective cesarean delivery at 38 versus 39 week gestation and any neonatal respiratory morbidity among our population.

Patients and methods

This was a prospective study conducted at the Kasr El-Aini Hospital, Cairo University, Egypt. Two hundred healthy pregnant women who underwent elective cesarean delivery at 38 or 39 weeks of gestation during the study period (from 1st December 2010 to 31st July 2012) were enrolled in the study after obtaining consents. They were aged 28.2 ± 4.8 years.

All recruited women underwent elective cesarean delivery (i.e., a delivery performed in the absence of labor or other recognized medical or obstetrical indications for delivery) and gave birth to a viable singleton infant at 38 weeks of gestation (group A) or 39 weeks of gestation (group B). Women with diabetes mellitus, hypertension or pre-eclampsia, or intrauterine growth retardation or twin pregnancy, antepartum hemorrhage or ruptured membranes as well as infants with meconium aspiration syndrome, sepsis, or pneumonia were excluded from the study. The study protocol was approved by our Investigational Review Board (IRB) and was conducted in accordance with the Institutional Committee for the Protection of Human Subjects and adopted by the 18th World Medical Assembly, Helsinki, Finland.

All women were subjected to detailed history-taking and thorough clinical examinations. Gestational age was

determined by the date of the last menstrual period and ultrasound examination and took into consideration the clinical history and the results of the earliest ultrasound examination.

All deliveries were attended by the neonatologist; details of the resuscitation at the delivery scene were recorded. After delivery, all neonates were admitted to the intermediate care room and subjected to full clinical examination; neonates with respiratory distress were subjected to further laboratory investigations and chest X-ray.

Main outcome measures were respiratory morbidity including: transient tachypnea of the newborn (TTN), respiratory distress syndrome (RDS), cardiopulmonary resuscitation or ventilator support within 24 h after birth, admission to the NICU, or prolonged hospitalization (5 days or longer) due to respiratory distress.

The diagnosis of respiratory distress syndrome required signs of respiratory distress, consistent radiologic features, and oxygen therapy with a fraction of inspired oxygen (FiO_2) of 0.40 or greater for at least 24 h or until death and transient tachypnea of the newborn was defined by the presence of tachypnea within hours after birth and typical radiologic findings [7].

Statistical analysis

Patients' data were analyzed using SPSS 17.0 for windows 7. Quantitative variables were expressed by mean and SD (Standard deviation), compared using unpaired t-student test and Mann-Whitney test. Qualitative variables were expressed as numbers (frequency) and percent and compared between groups using the Chi-square test. The odds ratio of the primary outcomes of both study groups was calculated. All P values are two tailed and considered to be significant if less than 0.05.

Results

Maternal and neonatal characteristics are shown in Table 1. There were no significant differences in both groups regarding maternal age and parity ($p = 0.6$; 0.8 respectively). Previous cesarean section was the most frequent indication of cesarean section in both groups (Fig. 1); however, the frequency distribution of cases in relation to number of cesarean deliveries was different between both groups ($p = 0.001$).

Among the studied cases, there were no reported neonatal deaths in both groups. The prevalence of respiratory morbidity after delivery was 25% in group A compared to 11% in group B while TTN was observed in 10% of group A compared to 7% of newborns of group B. RDS developed in 3 cases of group A, while none of group B newborns developed RDS. Risk estimation showed that delivery at 38 weeks carries 2.7 time risk of having a newborn suffering from respiratory morbidity, i.e. Odds ratio 2.7 (95% Confidence Interval: 1.2–5.8) (Table 2).

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