

INFLUENCE OF MODE OF DELIVERY AT TERM ON THE NEONATAL RESPIRATORY MORBIDITY

Masoud Dehdashtian¹, Ehsan Riazi², Mohammad Hasan Aletayeb³

ABSTRACT

Objective: Respiratory morbidity is an important complication of elective cesarean section. Our objective was to find out the incidence of respiratory distress in term neonates delivered by elective cesarean section and compare it with neonates delivered vaginally.

Methodology: We evaluated one thousands infants delivered by elective cesarean section and normal vaginal delivery for respiratory distress.

Results: Among 500 cesarean done, 27 (5.4%) neonates had respiratory distress and among 500 vaginal delivery infants, 8(1.6%) developed respiratory Distress (P<0.001).

Conclusions: The odd ratio for neonatal respiratory distress was 3.38, almost threefold higher in cesarean section group than those delivered vaginally.

KEY WORDS: Cesarean delivery, Term infant, Neonatal respiratory Distress, Transient Tachypnea of Newborn, Catecholamine, Fetal lung Fluid.

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INTRODUCTION

Respiratory morbidity is an important complication of elective cesarean section (ECS) in term infants.¹⁻⁴ The incidence of respiratory distress was reported in 6% of newborns delivered by ECS,⁵ versus 1% in Infants born vaginally.⁶ The presence of labor preceding

cesarean section reduce the risk of respiratory morbidity in the neonatal period.^{2,3} The aim of this study was to determine the incidence of respiratory distress in term neonates delivered by ECS in relation to neonates delivered vaginally.

METHODOLOGY

We did a prospective epidemiological cross – sectional study from May 2006 to November 2006 in private and governmental hospitals of Ahwaz, the center of khozestan province of Islamic republic of Iran. In this study a neonate was considered term if delivery was performed after the end of 37 weeks of first day of last menstrual period, a cesarean section was assumed elective if infants delivered by scheduled surgery and before the onset of labour. Vaginal delivery was supposed normal if the onset of labour was spontaneous, singleton, there was no complication of pregnancy and instrumentation. Furthermore, mothers with

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diabetes mellitus, chronic hypertension, preeclampsia, addiction, renal failure, hemoglobinopathies, heart failure, isoimmunization, multiple gestation, induction, or meconium stained amniotic fluid were excluded.

The infants born by elective cesarean section or vaginal delivery at two academic and two private medical centers were evaluated for respiratory distress during the first day of life. The newborns who needed greater than 40% oxygen concentration were referred to neonatal intensive care unit of Imam Khomeini Hospital of Ahwaz. Data was extracted from charts of mothers and their infants. We estimated that with consideration of 6% Incidence of respiratory distress after ECS at 37 weeks gestation, and 1% after vaginal delivery, 204 deliveries per group was needed. To enhance the value of the study we evaluated 500 deliveries per group. The data were analyzed by SPSS 13. Fisher exact test, chi square test were applied where appropriate. P value, odd ratio and 95% Confidence Interval (CIs) were calculated. A value of $P < 0.05$ was considered significant. The study was approved by the research ethics committee of Ahwaz Jondishapour University of medical science.

RESULTS

The incidence of respiratory morbidity was 5.4% (NO. 27) in infants delivered by ECS and 1.6% (NO. 8) in normal vaginal delivery infants ($P < 0.001$) (Fig-1). The odd ratio for respiratory distress in ECS group Was 3.38 (CI 1.55 – 7.36). Respiratory signs and clinical diagnosis of neonates with respiratory distress are shown in Table-I. Eighteen (2.66%) of the neonates with respiratory distress in cesarean group, and three infants (37.5%) in vaginal delivery group needed oxygen concentration greater than 40% and were admitted to neonatal intensive care unit ($P = 0.001$), (OR: 3.6; CI 1.35 -9.6). Two infants with respiratory distress who delivered by ECS needed mechanical ventilation but none of the vaginal delivery group ($P = 0.5$). The mean duration time of admission was four day in cesarean and three days in vaginal delivery group infants. An infant with respi-

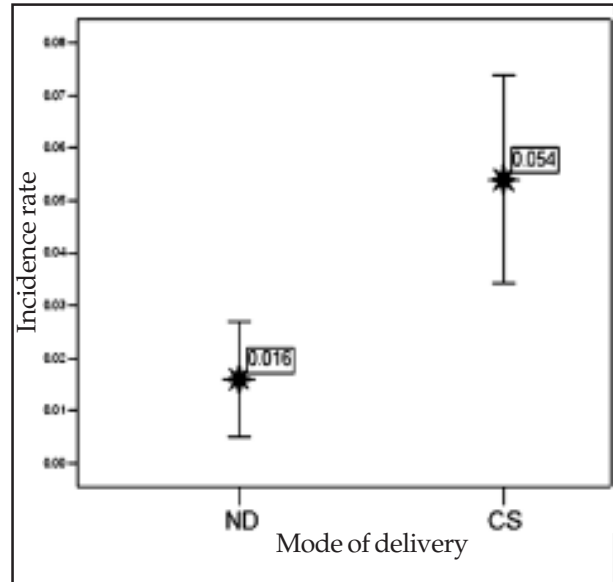


Fig-1: The incidence of respiratory distress in relation to mode of delivery

ratory distress in ECS group died due to persistent pulmonary hypertension of newborn. There was no death in vaginal delivery group, but one of them was discharged with diagnosis of hypoxic ischemic encephalopathy. The relation between route of delivery and respiratory distress syndrome, persistent pulmonary hypertension of newborn and hypoxic ischemic encephalopathy was evaluated ($P = 1$). The relation between route of delivery and need for admission to neonatal intensive care unit was significant ($P = 0.001$), (OR: 6.33; CI 1.89 – 21.3). There was no significant relation between delivery route and mortality rate ($P = 1$).

Table-I: Respiratory signs of neonates with respiratory distress

Respiratory signs	No. of patients (total 35)	%
Grunting	30	85.7
Tachypnea	25	71.43
Nasal flaring	11	32.43
Intercostal retraction	8	22.86
Cyanosis	5	14.29
Apnea	1	2.86

Table-II: Clinical diagnosis of newborns with respiratory distress

<i>Respiratory disease</i>	<i>Vaginal delivery group</i>	<i>Cesarean section group</i>
Transient tachypnea of newborn	7 (87.5%)	25 (92.5%)
Respiratory distress Syndrome	—	1 (3.75%)
PPHN*	—	1 (3.75%)
Hypoxic-ischemic Encephalopathy	1 (12.5%)	—
Total	8 (100%)	27 (100%)

*PPHN: Persistent pulmonary hypertension of newborn

DISCUSSION

In our study the incidence of respiratory morbidity in term neonates following ECS increased significantly compared with vaginal delivery. These results are in agreement with previous findings.^{7,8} Previous studies suggests that significant respiratory morbidity in term cesarean deliveries may be the result of iatrogenic prematurity.⁹ In our study, respiratory distress of the newborn was prevalent, despite the exclusion of poorly dated pregnancies and deliveries less than 37 weeks. In this study the incidence of respiratory morbidity in term infants born vaginally was 1.6%, which is similar to previous study.^{2,3}

Labor and delivery enhance neonatal lung adaptation. An explanation for this finding is possibly that labor and delivery induce a surge of catecholamines in the fetus,¹⁰ which is important for postnatal lung adaptation.¹¹ Infants born vaginally have higher catecholamine concentration at birth than infants born by ECS.¹² Catecholamines stimulate the absorption of fetal lung fluid, inhibit secretion of fetal lung fluid, and increase the release of surfactant.¹³ Infants born by elective cesarean section has a less pronounced perinatal catecholamine surge than infants born vaginally, possible cause being the absence of labor.⁷ However, there are lot of studies that show ECS increases the respiratory morbidity in term infants and the prevalence of cesarean delivery has increased dramatically in Islamic Republic of Iran during the past decade.¹⁴⁻¹⁶ The increased rate of ECS result in a considerable number of neonate who need respiratory

support, a diagnostic workup predisposing to additional morbidity and separation of the baby from the mother and probably increasing neonatal mortality rate.

CONCLUSIONS

The decision to undergo elective cesarean delivery appear to have negative impact on immediate neonatal outcome. Improvement of prenatal care and fetal monitoring toward reducing of gynecologist fear of perinatal Asphyxia, discussion of benefits of vaginal delivery for pregnant women and dangers of cesarean section for neonate and maternal well-being would be effective in reducing the rate of elective cesarean section.

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