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ORIGINAL ARTICLE

Use of Antenatal Steroids Treatment to Reduce Neonatal Respiratory Morbidity Prior to Cesarean Section in Preterm Birth

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ABSTRACT

Objective: To compare the rate of neonatal respiratory morbidity between individuals who received prenatal corticosteroids before to caesarean delivery at 34-37 weeks and those who did not.

Patients and Methods: A total of 150 patients who presented with preterm labour having gestational age between 34-37 weeks and no neonatal congenital anomaly on anomaly scan were recruited from June-2021 to December-2021 from the gynecology unit of Nishtar Hospital Multan. Women divided into two groups. Group A; in these patients intramuscular dexamethasone (12 mg) was given in 2 doses 12 hours apart. Group B (Control group): in these patients no drug was given as a prophylaxis again neonatal respiratory morbidity. After delivery, each neonate was monitored for 24 hours after delivery to determine the respiratory morbidity.

Results: Mean age of patients was 31.19±5.02 years. Mean gestational age was 35.66±1.10 weeks with range of 34-37 weeks. There were 78 (52.0%) patients who were prima-gravida and remaining 72 (48.0%) were Multi-gravida. There were 14 (9.3%) patients who were having previous abortion history. Respiratory morbidity was diagnosed in only 2 (2.7%) neonates in group A and in 07 (9.3%) neonates in group B (p-value 0.08)

Conclusion: Prenatal corticosteroid therapy prior to elective caesarean section at 34–37 weeks of gestation significantly reduces neonatal respiratory morbidity.

Keywords: Antenatal corticosteroids, Elective cesarean section, Neonatal respiratory morbidity.

INTRODUCTION

Preterm births i.e. birth before 37 weeks of gestation, is major problem in health care centers overall the world.[1] RDS is defined as early respiratory distress that contains cyanosis, grunting retraction ad tachypnea.[2,3] Fetal lungs depend on sufficient amount of surfactant for lung maturation[1.] One of the main factor for insufficient surfactant production is preterm birth.[1] Infants born at late preterm have higher risk of respiratory morbidity and admission to intensive care unit as compared to term infants.[4] This has been reviewed in literature that Transient tachypnea of the newborn infant, which is mostly self-limited condition can be overcome greatly by giving antenatal steroid in preterm birth.[5]

The frequency of Caesarean section is increasing in the past few decades.[4] One of the complications of caesarean section is neonatal respiratory morbidity.[3] 75% of all preterm birth are late preterm births.[3]

Many studies have shown that steroid therapy that is given antenataly has positive effect on lung maturation thus reducing severity of RDS.[2] Single course of steroid therapy does not have significant side effect on mother or baby.[2] It is presumed that antenatal steroid given after 34 week of gestation in pregnancy has beneficial effect in terms of reducing neonatal respiratory morbidity and NICU admissions.[5] But the results regarding steroid treatment beyond 34 week of gestation are conflicting.[5,6]

The aim of the proposed study was to compare the neonatal respiratory morbidity in patients receiving antenatal dexamethasone with control group. As studies have reported mixed results regarding the use of dexamethasone in preventing neonatal respiratory morbidity. So this study results helped to decide either to use dexamethasone in women with pre-term labor or not.

MATERIALS AND METHODS

A total of 150 patients who presented with preterm labour having gestational age between 34-37 weeks and no neonatal congenital anomaly on anomaly scan were recruited from June-2021 to December-2021 from the gynecology unit of DHQ Teaching Hospital Gujranwala. Patients presenting in term, or whose neonates diagnosed of having congenital anomalies and women who were not willing to be included in this study. Were excluded. A written consent was taken from each patient.

Women divided into two groups using draw randomization. Group A; in these patients intramuscular dexamethasone (12 mg) was given in 2 doses 12 hours apart. Group B (Control group): in these patients no drug was given as a prophylaxis again neonatal respiratory morbidity.

Cesarean section was performed in all patients by consultant gynecologist of the hospital. After delivery, each neonate was monitored for 24 hours after delivery to determine the respiratory morbidity by a resident doctor who was not blind to the study protocol. The following criteria was used to determine neonatal respiratory morbidity; presence of respiratory rate >60/min, Chest wall retractions, Expiratory grunting and Nasal flaring on general physical examination within 24 hours after birth.

Data was analyzed through SPSS version 16. Mean and standard deviation were used to present quantitative variables such as age of mother, and gestational age at child birth. Frequency and percentage were used to present gravidity, previous history of abortion and neonatal respiratory morbidity. Chi-square test were applied to compare neonatal respiratory morbidity between the groups.

RESULTS

Mean age of patients was 31.19±5.02 years. Mean gestational age was 35.66±1.10 weeks with range of 34-37 weeks. There were 78 (52.0%) patients who were prima-gravida and remaining 72 (48.0%) were Multi-gravida. There were 14 (9.3%) patients who were having previous abortion history.

There was significantly higher frequency of respiratory morbidity in control group in comparison to study group. Respiratory morbidity was diagnosed in only 2 (2.7%) neonates in group A and in 07 (9.3%) neonates in group B (p-value 0.08) [Table 1].

Table 1. Comparison of Respiratory Morbidity between the Groups.

Neonatal Respiratory Morbidity	Study Group		P-value
	Group A	Group B	
Yes	02 (2.7%)	07 (9.3%)	0.08
No	73 (97.3%)	68 (90.7%)	

DISCUSSION

As the rate of elective CS has increased over the past few decades, the need of preventing respiratory issues linked with this high rate of CS has been highlighted. Because resources are limited in impoverished countries, it is more difficult to give expensive therapies such as neonatal care. Predicted NRD rates range from 2.8 percent to 2.9 percent, with the most significant risk factors being the mother's gestational age and the method of delivery.[7] When compared to vaginal birth, the use of EL-LSCS was linked to a 4-fold increase in respiratory distress and a 5-fold increase in significant respiratory morbidity.[8] Despite the fact that the risk of NRM is relatively low (2-fold) in the near term, it is critical to adopt the most effective measures possible to mitigate this problem.

The release of catecholamines and corticosteroids is blocked in the absence of labor-induced stress, which is required for the eventual maturation of the foetal lungs to take place. Neonatal lung maturity at term is achieved through the elimination of excess fluid from alveoli and an increase in pulmonary blood perfusion, which are the two key mechanisms required. Catecholamines and glucocorticoids are the most important mediators for the activation of Na reabsorption in the lungs of the foetus and the synthesis of surfactant in the lungs of pregnant women in advanced gestational age, among other things.[9-11] It has been shown that exogenous glucocorticoids can increase the number and function of these Na+ channels in cases of ECS, as well as their sensitivity to catecholamines and thyroid hormones.[12]

Our findings revealed a statistically significant association between dexamethasone and NRM, with the frequency of NRM being 2.7 percent in the dexamethasone group compared to 9.3 percent in the control group.

A study conducted by Dileep et al. reported similar findings. They reported respiratory morbidity in 1.0% patients who received dexamethasone and in 10.20% neonates who did not received dexamethasone.[13]

Similar results were reported by Kirshenbaum et al. who also did not find any significant benefit of steroid administration, they reported respiratory morbidity in 25.9% neonates in corticosteroid group and in 25.2% neonates without corticosteroid treatment that was given antenataly prior to 34-37 week of gestation.[14]

However, in contrast to our findings, an earlier, randomised controlled trial, with 320 participants, found that antenatal corticosteroid treatment during the 34–36 week of gestation did not lower the prevalence of respiratory problems in newborn infants. Furthermore, with the exception of jaundice, prenatal therapy with corticosteroids was found to be ineffective in reducing the prevalence of other problems associated with late immaturity.[15]

CONCLUSION

Prenatal corticosteroid therapy prior to elective caesarean section at 34–37 weeks of gestation significantly reduces neonatal respiratory morbidity.

REFERENCES

1. McPherson C, Wambach JA. Prevention and Treatment of Respiratory Distress Syndrome in Preterm Neonates. Neonatal Netw. 2018;37(3):169-77.
2. Shahzad F, Umar N. Impact of antenatal corticosteroids on frequency and mortality due to respiratory distress syndrome in preterm neonates. J Ayub Med Coll Abbottabad. 2016;28(4):698-701.
3. Swanson JR, Sinkin RA. Transition from fetus to newborn. Pediatr Clin North Am. 2015;62(3):329–43.
4. Pramanik AK, Rangaswamy N, Gates T. Neonatal respiratory distress: a practical approach to its diagnosis and management. Pediatr Clin North Am. 2015;62(2):453–69.
5. Kamath-Rayne BD, Rozance PJ, Goldenberg RL, Jobe AH. Antenatal corticosteroids beyond 34 weeks gestation: What do we do now?. Am J Obstet Gynecol. 2016;215(4):423-30.
6. Smith GC. Antenatal Betamethasone for Women at Risk for Late Preterm Delivery. N Engl J Med. 2016;375(5):486.
7. Paganelli S, Soncini E, Gargano G, Capodanno F, Vezzani C, La Sala GB. Retrospective analysis on the efficacy of corticosteroid prophylaxis prior to elective caesarean section to reduce neonatal respiratory complications at term of pregnancy: review of literature. Arch Gynecol Obstet. 2013;288:1223-9
8. Hansen AK, Wisborg K, Uldbjerg N, Henriksen TB. Risk of respiratory morbidity in term infants delivered by elective caesarean section: cohort study. BMJ 2008;336:85.
9. Jain L, Dudell GG. Respiratory transition in infants delivered by cesarean section. Semin Perinatol. 2006;30(5):296-304.
10. Li Y, Zhang C, Zhang D. Cesarean section and the risk of neonatal respiratory distress syndrome: a meta-analysis. Arch Gynecol Obstet. 2019;300(3):503-17.
11. Costa-Ramón AM, Rodríguez-González A, Serra-Burriel M, Campillo-Artero C. It's about time: Cesarean sections and neonatal health. J Health Econ. 2018;59:46-59.
12. Helve O, Pitkänen O, Janér C, Andersson S. Pulmonary fluid balance in the human newborn infant. Neonatology. 2009;95(4):347-52.
13. Dileep A, Khan NB, Sheikh SS. Comparing neonatal respiratory morbidity in neonates delivered at term by elective Caesarean section with and without dexamethasone: retrospective cohort study. J Pak Med Assoc. 2015;65(6):607-11.
14. Kirshenbaum M, Mazaki-Tovi S, Amikam U, Mazkereth R, Sivan E, Schiff E, et al. Does antenatal steroids treatment prior to elective cesarean section at 34-37 weeks of gestation reduce neonatal morbidity? Evidence from a case control study. Arch Gynecol Obstet. 2018;297(1):101-7.
15. Gyamfi-Bannerman C, Thom EA, Blackwell SC, Tita AT, Reddy UM, Saade GR, et al.; NICHD Maternal–Fetal Medicine Units Network. Antenatal Betamethasone for Women at Risk for Late Preterm Delivery. N Engl J Med. 2016;374(14):1311-20.