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Research Article

**IMPACT OF ANTENATAL CORTICOSTEROID ON
RESPIRATORY MORBIDITY OF NEONATES DELIVERED
AFTER THIRTY FOUR WEEK OF GESTATION**¹Dr Maira Zafar, ²Dr Rabia Noor, ³Dr Maham Liaqat¹Mayo Hospital, Lahore²POF Hospital³Lahore General Hospital

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Abstract:

Objective: The purpose of this study is to investigate the impact of the antenatal corticosteroid prophylaxis on the respiratory morbidity of the neonates delivered between 34 to 37 gestation weeks.

Methodology: This retrograde research work assessed the respiratory complications of the neonates of 683 singleton pregnancies which delivered at 34 to 37 gestation weeks in our institute from January 2016 to September 2018. Group-1 (n: 294) contained the information of the females who did not get betamethasone and Group-2 (n: 396) contained the patients who obtained betamethasone after thirty-four gestation week for the patients having danger of birth before term. NRM (Neonatal Respiratory Morbidity) was the primary outcome. Any disease of respiration which always needs clinical support like supplemental oxygen or others is known as NRM. We compared the data about demographic traits, delivery mode, and weight of fetal at the time of birth, and respiratory complications of the neonates between the participants of both groups.

Results: We did not find any statistically significant disparity for the development rate of the respiratory morbidity of neonates in the patients of both groups. The rate of occurrence of the NRM was almost same in both groups (15.30% in control group and 14.90% in the intervention group)

Conclusion: We were unable to find any improvement with the administration of betamethasone practically in delayed preterm birth as regards prevention of NRM.

KEYWORDS: Neonatal Respiratory Morbidity, Morbidity, Neonates, Intervention, Respiration, Antenatal Corticosteroid Prophylaxis.

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INTRODUCTION:

The utilization of the antenatal corticosteroids among females delivered after 34 gestation weeks is a controversial issue. The administration of the antenatal corticosteroid is very effectual intervention for the increase in the lung maturation of fetal. The immature lung forms the wet surface for the passage of air but a mature under impact of steroid creates a suitable surface for airway. Although the development of the lung in fetal is complete, but we can see the severe issues of respiratory problems after thirty-four weeks of gestation [1]. There is not any important disparity in RDS rates, deaths of neonates, intra-ventricular bleeding, and stay in pediatric ICU between delayed preterm neonates obtaining or not obtaining steroids. The birth between thirty-four and thirty-seven pregnancy weeks and responsible for 60.0% to 70.0% of preterm births is the late preterm birth.

The prevalence of morbidity in respiration system including RDS (Respiratory Distress Syndrome) and TTN (Transient Tachypnea of Newborn), with a high rate of admissions in pediatric ICU, are very high in the late preterm neonates as compared to the term neonates [2, 3]. ACOG (American College of Obstetricians and Gynecologists) also recommended the antenatal corticosteroids till thirty-four weeks of pregnancy period [4]. RCOG (Royal College of Obstetricians and Gynecologists) also recommended the routine management of antenatal glucocorticoids for females present with danger of preterm birth with a pregnancy duration of thirty-four to thirty-eight weeks [5]. A trial stated that there is a decrease in the prevalence of respiration issues in the group of patients under treatment with the help of betamethasone [6]. Delayed preterm birth in comparison with term delivery has displayed that it has association with high risk of acquiring RDS and other morbidities related to respiratory system [7]. The immature structure of lung is the main cause behind this high rate of morbidity [8]. In one other research work in which there was use of antenatal steroids between 34-36 pregnancy weeks, there was decreased rate of the complications related to the respiratory issues of neonates [9].

METHODOLOGY:

This retrograde research work carried out from January 2016 to September 2018 in Gynecological Ward of Mayo Hospital, Lahore. This research work included 683 females with singleton pregnancy who gave birth to a healthy baby between thirty-four and forty-one gestation weeks, three hundred and eighty-nine females received betamethasone for the maturation of the fetal lung

between 34-37 pregnancy weeks. The ethical committee of the institute gave the permission to conduct this research work. We excluded the patients suffering from other serious diseases or complications from this research work. We used the last mensuration date and measurements of ultrasonography for determination of the gestation weeks. We recorded the obstetric data as demographic traits, gestational age at the time of admission, signs at the time of admission, delivery mode, used corticosteroids. Neonatal outcomes contained the information as weight at the time of birth, Apgar scores, morbidity and stay in pediatric ICU. NRM (Neonatal Respiratory Morbidity) was the primary outcome of this research work. NRM is respiratory disease which can be the result of different causes. Neonatology Department confirmed the problems related to respiration issues.

Treatment course consists of 2 betamethasone doses of twelve mg given intra-muscularly twenty-four hours apart or 4 doses of betamethasone of six mg provided intra-muscularly twelve hours apart. We managed full treatment course. We divided our participants into two groups; Group-1 contained 294 females who did not obtain betamethasone for the maturation of fetal lung and Group-2 contained 389 females who obtained betamethasone. SPSS V.23 was in use for the statistical analysis of the collected information. We present the continuous variables in averages and SDs. We present the categorical variables in percentages. We used T-test for the identification of differences between both groups. Comparison of the categorical variables carried out with the help of Chi-square test. P value of less than 0.050 was the significant one.

RESULTS:

The average age of the patients in Group-1 was 30.70 ± 5.70 years and the average age of the patients of Group-2 was 27.30 ± 5.60 years in Group-II. Average gestational age of Group-1 and Group-2 was 36.30 ± 0.90 and 36.40 ± 1.40 weeks correspondingly. The average weight at the time of birth was 2798.0 ± 291.0 grams and 2861.0 ± 430.0 grams in Group-1 and Group-2 correspondingly. There was no significant disparity in the gravidity, parity number, gestational age and weight at the time of birth between both groups as presented in Table-1. Total 44.20% (n: 132) neonates in Group-1 and one hundred and ninety-three newborns in Group-2 were delivered by CS (Cesarean Section) because of fetal distress or other related abnormalities. We found no significant difference in the progression of the respiratory issues among neonates delivered through CS or vagina.

Table-I: Baseline Characteristics of Patients

| Variables | Group I | | Group II | | P values |
|--------------------|------------|-----------------|------------|-----------------|----------|
| | No / Value | Percent / Range | No / Value | Percent / Range | |
| Age, years | 30.7 | 5.70 | 27.3 | 5.60 | <0.0010 |
| Gravidity | 2.0 | 0 - 7 | 2.0 | 1 - 14 | 0.4180 |
| Parity | 1.0 | 0 - 5 | 1.0 | 0 - 6 | 0.7750 |
| Gestational age at | 36.3 | 0.90 | 36.4 | 1.40 | 0.5860 |
| Birthweight, | 2798.0 | 291.00 | 2861.0 | 430.00 | 0.0300 |

We evaluated the Apgar scores of neonates present in both groups. There were following Apgar scores; seven and eight at one minute and eight and ten at five minutes in Group-1 and Group-2 respectively. There were high Apgar scores in Group-2 as compared to the patients of Group-1, showing a significant disparity ($P < 0.0010$ at 1 minute and $P < 0.0010$ at 5minute) (Table-2).

Table-II: Summary Of Outcomes

| Variables | | Group I | | Group II | | P value |
|----------------------|---------------|------------|-----------------|------------|-----------------|---------|
| | | No / Value | Percent / Range | No / Value | Percent / Range | |
| Delivery mode | C/S | 132.0 | 44.700% | 193.0 | 49.600% | |
| | Vaginal Birth | 163.0 | 55.300% | 196.0 | 50.400% | |
| Neonatal Sex | Female | 145.0 | 49.200% | 201.0 | 51.900% | |
| | Male | 150.0 | 50.800% | 186.0 | 48.100% | |
| Apgar Score | Apgar score 1 | 7.0 | 4 - 9 | 8.0 | 5 - 9 | <0.001 |
| | Apgar score 5 | 9.0 | 0 - 10 | 10.0 | 10-Jul | <0.001 |
| Respiratory Problems | RDS, TTN, Pul | 455.0 | 15.300% | 58.0 | 14.900% | 0.8850 |
| ICU Stay | No of Days | 3.0 | 1 - 20 | 5.0 | 0 - 29 | 0.0200 |

Additionally, 43.70% (n: 45) neonates in Group-1 and 56.30% (n: 58) in Group-2 were present with respiratory issues. There was no difference in the respiratory issues in the patients of both groups (Table-3). there was significant disparity in the delivery mode in accordance with the age of gestation (cesarean section < 37 gestational weeks; delivery through vagina > 37 gestational weeks).

Table-III: Hospitalization due to respiratory problems

| Characteristics | | Mean / No | SD / %age |
|--------------------|--|-----------|-----------|
| Gestational Period | Age | 36.0 | 1.00 |
| | C/S | 29.0 | 5.80 |
| Mode of Delivery | Vaginal delivery | 58.0 | 56.30 |
| | Group 1 | 45.0 | 43.70 |
| Groups | Group 2 | 45.0 | 43.70 |
| | Duration of delivery after betamethasone (min) | 58.0 | 56.30 |

DISCUSSION:

In current research work, we assessed the impact of administration of betamethasone in females with late preterm delivery and we discovered no important difference in reduction of the complications related to respiratory function. These results are same with the findings of a research work conducted by Fetiosa Porta who stated that antenatal steroids cannot decrease the danger of

respiratory complications of late preterm neonates. There is variation between the recommendations of the use antenatal steroid management in standard guidelines [4, 11]. One research work stated that requirement for the surfactant in ICU and danger of the severe disorders of respiratory tract can be decreased with the steroid administration [12]. There is different period of utilization of antenatal

steroid and amount of doses according to different research works.

Balci managed steroids in only single dose to neonates of thirty-four to thirty-four weeks of gestation and he showed a remarkable difference in the results of complications related with respiratory complications [13]. The duration between administration of steroid and child birth have influence on the morbidity related to the disorders of respiration [14]. Sekhavat declared in his research work that there was increases requirement of the resuscitation and ventilation if the administration of steroid carried out in short duration of less than forty-eight hours [14]. The outcome of one research work concluded that serious complications of respiration normally very less among neonates administered with steroids. This was a retrospective research work. There is need of further research works to consolidate the finding of this research work to reduce the complications related to respiratory system of neonates.

CONCLUSION:

The findings of this research work displayed no advantageous impact of the administration of empirically in late preterm deliveries for the prevention of NRM. There is need of further research works with more samples to assess the relationship.

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