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ORIGINAL ARTICLE

Efficacy of Antenatal Corticosteroid Injection in the Prevention of Neonatal Respiratory Distress Syndrome after Elective Caesarean Section at Term Pregnancy

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ABSTRACT

Aim: To determine the efficacy of antenatal corticosteroid in the prevention of respiratory distress syndrome of the neonates in women undergoing elective cesarean section at term pregnancy.
Study design: Descriptive case series
Place and duration of study: Department of Obstetrics and Gynecology, Lady Reading Hospital, Peshawar from 6th December 2018 to 6th May 2019.
Methodology: One hundred and seventy five women were enrolled. The women after taking complete history with obstetrical examination and antenatal corticosteroid administration i.e. 12 mg dexamethasone IM (two doses 12 hours apart) were observed. The caesarean section was performed by experienced obstetrician having minimum of five years of experience after 24 hours and within seven days of the second dose of dexamethasone. All the neonates were carefully examined in NICU for the detection of respiratory distress syndrome. All these observations were done under supervision of an expert pediatrician having minimum of five years of experience.
Results: The mean age was 28±11.34 years. Thirty five percent patients had POG range 37^{+} weeks while 65% patients had POG range 38^{+} weeks. Mean POG was 37±1.12 weeks. More over antenatal corticosteroid was effective in 97% patients and was not effective in 3% patients.
Conclusion: The antenatal corticosteroid was 97% effective in the prevention of respiratory distress syndrome of the neonates, in women undergoing ELSC at term after elective caesarean section for term pregnancy.
Keywords: Efficacy, Antenatal corticosteroid, Respiratory distress syndrome, Neonates, Elective C- section,

INTRODUCTION

Caesarean section rate has increased in recent years. It constitutes about 30-40% of births, of which around half are elective births.[1] Caesarean section is a major operation that increases both mother and baby's short-term and long-term adverse effects.[2] Caesarean section rate increase is a global phenomenon. While worldwide rates were different, approximately 15-20 per cent of deliveries were abdominal.[3] This increase in the caesarean rate, combined with fetal distress, dystocia or breech is mostly caused by the performance of the elective repeat caesarean section.[4] According to national sentinel caesarean section audits, in United Kingdom rate of abdominal births is 67% in women with previous caesarean as compared to 34% in primigravidas.[5]

Infants born after caesarean delivery are more likely than in vaginally born infants to have respiratory morbidity, and this risk increases further, with potentially severe implications for the subset of children delivered after elective caesarean section[1]. Neonatal respiratory distress syndrome (RDS) is a condition of pulmonary insufficiency that begins at or shortly after delivery and increases in severity over two days of life[6]. Clinically, RDS presents as respiratory distress including cyanosis, grunting, retraction and tachypneas[7]. Blood gas analysis determined respiratory failure, chest X-ray with a classic appearance of 'ground glass' and air Bronchograms can further validate the diagnosis[8]. Survivors show resolution between 2 to 4 days. Progressive hypoxia and respiratory failure may lead to death in untreated cases[9].

According to the recommendation of American College of Obstetricians and Gynecologists, elective delivery should not be carried out before 39 weeks of pregnancy without documentation of fetal lung maturity[10]. Ultimately in final maturation of the lungs, corticosteroids play a vital role by increasing number and function of sodium channels thereby increasing surfactant synthesis.[11] Most of these elective deliveries occur early in time (37/7 to 38 6/7 weeks gestation), when the data to support the potential benefit of administration of prenatal corticosteroid therapy is limited. However, with some data showing that steroid therapy improves fetal lung maturity profiles beyond 34 weeks gestation[12]. Some obstetricians provide antenatal corticosteroids in an effort to induce overall fetal maturation and prevent neonatal morbidity with imminent delivery of the fetus[13].

One study showed a considerably decreased NICU admission rate for respiratory morbidity among women taking ANS compared to control group (1.6% versus 3.9% p = 0.014)[14]. The neonates had lower overall incidence of respiratory distress, morbidity of 7.9% in the ANS group as compared to control group 23%[15].

The purpose of this study is to investigate the effectiveness of ANS in preventing neonatal RDS among women having elective caesarean section at term pregnancy. Not only in our settings, but throughout the world, caesarean delivery is common. ANS is highly suggested before caesarean section. Other than

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prematurity, caesarean section itself can lead to some pulmonary complications in infants.

MATERIALS AND METHODS

This descriptive case series was conducted after approval from Ethical Committee in the Department of Obstetrics and Gynecology, Lady Reading hospital, Peshawar 6th December 2018 to 6th May 2019 Methodology: One hundred and seventy five women were enrolled. All women in age 18-40 and any parity scheduled for elective cesarean section and presenting at 37 to 38+6 weeks of gestation on ultrasound were included. Women with multiple gestations on ultrasound, oligohydramnios on US, undergoing c. section for fetal compromise, IUGR, abnormal uterine artery Doppler (to control for confounders), history of steroid use anytime during pregnancy before presentation (to control bias), emergency caesarean section, normal vaginal delivery, preterm births delivered by caesarean section or vaginal delivery and any congenital anomaly of baby diagnosed antenatally or postnatally were excluded.

All women were subjected to complete history taking and obstetrical examination. All women were subjected to antenatal corticosteroid administration i.e. 12mg dexamethasone IM (two doses 12 hours apart). The cesarean section was performed by experienced obstetrician having minimum of five years of experience after 24 hours and within seven days of the second dose of dexamethasone. All the neonates were carefully examined in NICU for the detection of respiratory distress syndrome. All these observations were done under supervision of an expert pediatrician having minimum of five years of experience. The data was entered and analyzed through SPSS-23.

RESULTS

One hundred and nineteen (68%) patients were in age range 18-30 years while 56(32%) patients were in age range 31-40 years with mean age was 28±11.34 years. Sixty one (35%) patients had POG range 37^+ weeks while 114(65%) patients had POG range 38^+ weeks and mean POG was 37±1.12 weeks. Fifty eight (33%) patients were primi gravida while 117(67%) patients were multi gravida (Table 1). The antenatal corticosteroid was effective in one hundred seventy (97%) patients and not effective in five (3%) patients (Table 2).

Table 1: Demographic information of the women (n=175)

Variable	No.	%
Age (years)		
18-30	119	68.0
31- 40	56	32.0
Gestational age (weeks)		
37^+	61	35.0
38^+	114	65.0
Parity		
Primi para	58	33%
Multi para	117	67%
Gravidity		
Primi gravid	58	33.0
Multi gravid	117	67.0

Table 2: Efficacy of antenatal corticosteroid (n=175)

Efficacy	No.	%
Effective	170	97.0
Not effective	5	3.0

DISCUSSION

The age mean was 28±11.34 years and the POG range was 37^+ weeks for 35% and the POG range 38^+ weeks for 65%. Mean POG for weeks was 37±1.12 weeks. Moreover, prenatal corticosteroid is effective in 97% of patients and not in 3%. Nada et al[16] showed a substantially reduced rate of NICU stay for respiratory morbidity than in the control group in women using ANS (1.6% versus 3.9%; p=0,014]. Ahmed et al[17] also reported that neonates of the women in ANS group shown 7.9% lower incidence of respiratory distress morbidity as compared to control group 23%.

Costa et al[18] stated that 170(41.4%) newborns were exposed to single dose 12-mg betamethasone, whereas 241 (58.6%) received no any antenatal corticosteroids therapy. In the ACS group, the mean gestational age was lower (30.4±2.4 weeks compared 31.2±2.9 weeks, p=0.004) and the mean birth weight 1375±454 g versus 1625±580 g, p<0.001. The univariate analysis showed that intubation in delivery room and respiratory distress syndrome in the ACS group were more common, and NICU stay time in this group was also significantly longer. There was no difference between survival rate, newborn morbidity, mechanical ventilation demand and duration, and oxygen treatment. The incidence of major outcomes was also similar in survivors. The logistic regression adjusted for gestational age showed no significant reduction in the rate of any neonatal result in the single dosage of betamethasone group before delivery. In this study, the subgroup of 25-27 weeks who had ACS, delivery room intubation, surfactant treatment and patent ductus arteriosus (PDA) were less frequent. They had also shorter ventilation and oxygen therapy duration. In 30-31 weeks subgroup, ACS infants had a lower incidence and shorter duration of oxygen treatment and mechanical ventilation. In the subgroup of 28-29 weeks and 32-34 weeks, no differences were found.

Shahzad et al stated that 230 patients were divided on the basis of dexamethasone exposure in two groups. In the present study, 76(33.0%) cases (preterm neonates) had respiratory distress syndrome, of which 26(22.4%) were in exposed group and 50(43.9%) of non-exposed group. Mortality due to respiratory distress syndrome was seen among all RDS preterm neonates, 29(12.6%) cases; out of these 5(4.3%) cases belonged to exposed group and 24(21.1%) cases belonged non-exposed group.

CONCLUSION

Antenatal corticosteroid was 97% effective in the prevention of respiratory distress syndrome of the neonates, in women undergoing elective cesarean section at term after previous elective caesarean section for term pregnancy.

Conflict of interest: Nil

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