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Original Research

Assessment of effect of antenatal corticosteroids for women at risk of late preterm

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ABSTRACT:

Background: Respiratory morbidity including respiratory distress syndrome is a main causative factor of early neonatal morbidity and mortality in preterm births. The present study was conducted to assess the effect of antenatal corticosteroids for women at risk of late preterm. **Materials & Methods:**74 women with a singleton gestation at high risk for late preterm delivery were divided into 2 groups of 37 each. Group I patients were given injections of 12 mg betamethasone and group II patients were given placebo 24 hours apart. Neonatal and maternal outcome were compared. **Results:** The indication for trial entry was preterm labor with intact membranes in 20 and 18 patients in group I and II and ruptured membranes in 17 and 19 in group I and II respectively. Gestational age at trial entry was ≤ 34 weeks seen in 8 and 11, 35 weeks in 17 and 16 and ≥36 weeks in 12 and 10 in group I and II respectively. The difference was significant (P< 0.05). Neonatal outcomes in group I and group IIwas neonatal death in 3 and 1, proven neonatal sepsisin 4 and 8, necrotizing enterocolitis in 0 and 1, hypoglycemia in 7 and 4 and intraventricular hemorrhage in 3 and 1 patients respectively. The difference was significant (P< 0.05). In group I and group II, cesarean delivery was seen in 21 and 24, postpartum endometritis in 15 and 13 and chorioamnionitis in 8 and 14 patients respectively. The difference was significant (P< 0.05). **Conclusion:** The rate of infant respiratory morbidity was dramatically decreased when betamethasone was administered to women who were at risk of having a late preterm delivery.

Key words: Antenatal corticosteroids,Respiratory morbidity, respiratory distress syndrome

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INTRODUCTION

Respiratory morbidity including respiratory distress syndrome is a main causative factor of early neonatal morbidity and mortality in preterm births.[1] The use of antenatal corticosteroidshas shown reduction in respiratory morbidities by enhancing the surfactant formationand also reduced incidence of intraventricular hemorrhage, necrotizing enterocolitis in preterm births.[2] Both dexamethasone and betamethasone are used for antenatal corticosteroid therapy for women at risk of preterm birth but still it is unclear which among the two is of greater benefit for both mother and fetus. In some studies, it is also found that antenatal betamethasone caused a reduction in fetal body and breathing movements and variation in fetal heart rate also hence it is of utmost importance to study hemodynamic changes in fetal and uteroplacental circulation after antenatal corticosteroid administration.[3]

Antenatal corticosteroids have been widely used in practice for pregnancies at risk for early preterm delivery. Historically, their use has been confined to pregnancies at less than 34 weeks gestation due to lack of data to support use beyond 34 weeks, as well as neonatal survival of late preterm infants closely approaching the survival of term infants.[4] The late preterm period is defined as 34 weeks 0 days, through 36 week 6 days; with 8% of all deliveries occurring during this time period. More recent literature has demonstrated that while overall survival in the late preterm period is within 1% of survival of term neonates, there are increased morbidities and long-term complications of late preterm infants.[5,6]The present study was conducted to assess the effect of

antenatal corticosteroids for women at risk of late preterm delivery.

MATERIALS & METHODS

The present study consisted 74 women with a singleton gestation at high risk for late preterm delivery. All gave their written consent to participate in the study.

Data such as name, age, etc. was recorded. Patients were divided into 2 groups of 37 each. Group I patients were given injections of 12 mg betamethasone and group II patients were given placebo 24 hours apart. The primary outcome was a neonatal composite of treatment in the first 72 hours (continuous positive airway pressure or high flow nasal cannula for at least two hours, supplemental oxygen with a fraction of inspired oxygen of at least 30 percent for at least four hours, extracorporeal membrane oxygenation or mechanical ventilation) or stillbirth or neonatal death before 72 hours.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table IBaseline characteristics

Parameters	Variables	Group I	Group II	P value
Indication for trial entry	Preterm labor with intact membranes	20	18	0.75
	Ruptured membranes	17	19	
Gestational age at trial entry	≤ 34 weeks	8	11	0.94
	35 weeks	17	16	
	≥36 weeks	12	10	

Table I shows that the indication for trial entry was preterm labor with intact membranes in 20 and 18 patients in group I and II and ruptured membranes in 17 and 19in group I and II respectively. Gestational age at trial entry was ≤ 34 weeks seen in 8 and 11, 35 weeks in 17 and 16 and ≥36 weeks in 12 and 10in group I and IIrespectively.The difference was significant (P< 0.05).

Table II Neonatal outcomes

Neonatal outcomes	Group I	Group II	P value
Neonatal death	3	1	0.05
Proven neonatal sepsis	4	8	0.01
Necrotizing enterocolitis	0	1	0.94
Hypoglycemia	7	4	0.03
intraventricular hemorrhage	3	1	0.05

Table II, graph I show that neonatal outcomes in group I and group II was neonatal death in 3 and 1, proven neonatal sepsis in 4 and 8, necrotizing enterocolitis in 0 and 1, hypoglycemia in 7 and 4 and intraventricular hemorrhage in 3 and 1 patients respectively. The difference was significant (P< 0.05).

Graph I Neonatal outcomes

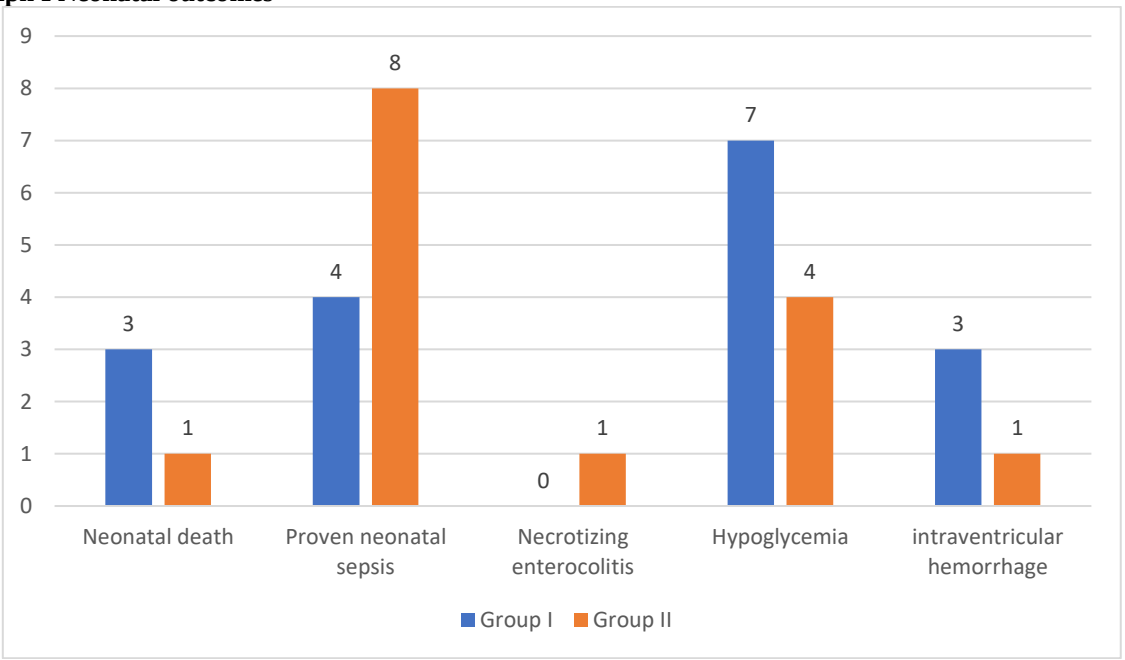

Table III Maternal outcomes

Maternal outcomes	Group I	Group II	P value
Cesarean delivery	21	24	0.95
Postpartum endometritis	15	13	0.82
Chorioamnionitis	8	14	0.01

Table III shows that in group I and group II, cesarean delivery was seen in 21 and 24, postpartum endometritis in 15 and 13 and chorioamnionitis in 8 and 14 patients respectively. The difference was significant (P< 0.05).

DISCUSSION

Corticosteroid administration before anticipated preterm birth is one of the most important antenatal therapies available to improve newborn outcomes.[7] A single course of corticosteroids is recommended for pregnant women between 24 0/7 weeks and 33 6/7 weeks of gestation who are at risk of preterm delivery within 7 days, including for those with ruptured membranes and multiple gestations.[8] It also may be considered for pregnant women starting at 23 0/7 weeks of gestation who are at risk of preterm delivery within 7 days, based on a family's decision regarding resuscitation, irrespective of membrane rupture status and regardless of fetal number.[9,10]The present study was conducted to assess the effect of antenatal corticosteroids for women at risk of late preterm delivery.

We found that the indication for trial entry was preterm labor with intact membranes in 20 and 18 patients in group I and II and ruptured membranes in 17 and 19 in group I and II respectively. Gestational age at trial entry was ≤ 34 weeks seen in 8 and 11, 35 weeks in 17 and 16 and ≥36 weeks in 12 and 10 in group I and II respectively. Bannerman et al[11] enrolled singleton gestation at high risk for late preterm delivery. Participants were randomized to two injections of 12 mg betamethasone or matching placebo 24 hours apart. 2,831 patients were randomized. The primary outcome occurred in 11.6% of the betamethasone group versus 14.4%, in the placebo group. Severe respiratory morbidity, transient tachypnea of the newborn, surfactant use, and bronchopulmonary dysplasia were also significantly less common in the betamethasone group. There were no significant differences between groups in the incidence of chorioamnionitis or neonatal sepsis. Neonatal hypoglycemia was more common in the betamethasone group.

We observed that neonatal outcomes in group I and group II was neonatal death in 3 and 1, proven neonatal sepsisin 4 and 8, necrotizing enterocolitis in 0 and 1, hypoglycemia in 7 and 4 and intraventricular hemorrhage in 3 and 1 patients respectively. Alexandre M Nozaki et al[12] examined the effects of betamethasone administration on umbilical artery(UA), middle cerebral artery(MCA), and ductus venosus(DV) doppler flow on 32 singleton pregnancies complicated by fetal growth restriction with absent end diastolic flow in UA and he found that there was reduction in umbilical artery and in the ductus venosus pulsatility indices with 24 hours from betamethasone administration that was maintained up to 48 hours.

Y chitrit et al[13] investigated the effects of maternal dexamethasone administration on umbilical and fetal cerebral artery flow velocity waveforms on 26 pregnant women with singleton pregnancies considered at risk for preterm delivery and at baseline. All pregnancies had normal fetoplacental vascular resistance and concluded that in healthy fetuses a transient, significant and unexplained decrease in fetal middle cerebral artery impedance on the 4th day following maternal dexamethasone administration.

We found that in group I and group II, cesarean delivery was seen in 21 and 24, postpartum endometritis in 15 and 13 and chorioamnionitis in 8 and 14 patients respectively. ElsnosyElwany et al[14]in study on 52 pregnant women with singleton pregnancies who are at risk for preterm birth studied the changes in fetal and uteroplacental hemodynamics after antenatal dexamethasone and he found that antenatal corticosteroid improved the fetal and uteroplacental circulation.

The limitation of the study is the small sample size.

CONCLUSION

Authors found that the rate of infant respiratory morbidity was dramatically decreased when betamethasone was administered to women who were at risk of having a late preterm delivery.

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