Original Research Article

Assessment of outcome of acute respiratory distress syndrome in premature babies in mothers on antenatal corticosteroids

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Received: 16-02-2021 / Revised: 28-03-2021 / Accepted: 29-04-2021

Abstract

Background: Respiratory distress syndrome continues to be the most important pulmonary problem during the neonatal period. The present study was conducted to assess outcome of acute respiratory distress syndrome in premature babies in mothers on antenatal corticosteroids.**Materials & Methods:**56 premature babies to mothers who received antenatal corticosteroids of both genders were included. Newborns were classified based on their gestational age into 3 groups. Group I had newborns of 26–28 weeks, group II with 28–32 weeks, and group III with 34 weeks. Parameters such as incidence of RDS, the requirement of continuous positive airway pressure (CPAP), mechanical ventilation, and need for surfactant were recorded. **Results:** Group I had 4, group II had 30 and group III had 12 newborn. 2, 24and 2 received 1 dose ACS and 2, 25 and 10 received 2 doses ACS, 4, 30 and 12 needed oxygen support, 3, 9 and 4 developed RDS, 0, 15 and 5 needed CPAP, 4, 16 and 3 needed mechanical ventilation and 4,21 and 5 required surfactant in group I, II and III respectively. The difference was significant (P< 0.05). Pre term babies developed RDS were 26 out of which 24 survived and 2 died and preterm babies with RDS who received surfactant were 30 out of which 25 survived and 5 died. **Conclusion:** Two doses of ACS 24 hour apart can decrease the incidence of RDS, the need for mechanical ventilation, and increased survival rate of preterm.

Keywords: Preterm, mechanical ventilation, Acute Respiratory distress syndrome.

Introduction

Prematurity represents a serious problem for healthcare services throughout the world. Respiratory distress syndrome continues to be the most important pulmonary problem during the neonatal period, affecting a large number of premature infants[1].The morbidity and mortality rates of premature infants are much higher than those of full-term babies. Premature infants have a higher incidence of respiratory distress syndrome (RDS), which is one of the main causes of early neonatal mortality[2].

Administering corticosteroids to pregnant women at risk of preterm birth to reduce the severity of neonatal respiratory distress syndrome is an established intervention[3]. These agents are thought to improve surfactant production, and there is also an associated reduction in the risk of neonatal intraventricular haemorrhage, necrotising enterocolitis, hyperbilirubinaemia, and neonatal death[4].Antenatal corticosteroid treatment was recommended for any woman likely to deliver between 24 and 34 weeks gestation. At that time, there was little evidence that such treatment was of benefit to babies of less than 28 weeks gestation[5]. However, subsequent observational data indicate that antenatal steroids are also effective at reducing the incidence of respiratory distress in babies less than 28 weeks. Indeed, it appears that giving antenatal steroids to women at less than 35 weeks gestation shortly before delivery halves the risk of respiratory distress developing after birth, regardless of the gestational age at which delivery occurs[6]. The present study was conducted to assess outcome of acute respiratory distress syndrome in premature babies in mothers on antenatal corticosteroids.

Materials & Methods

The present study comprised of 56 premature babies to mothers who received antenatal corticosteroids of both genders. The consent was obtained from all mothers before starting the study.

Data such as name, age, gender etc. was recorded. These newborns were classified based on their gestational age into 3 groups. Group I had newborns of 26–28 weeks, group II with 28–32 weeks, and group III with 34 weeks. Parameters such as incidence of RDS, the requirement of continuous positive airway pressure (CPAP), mechanical ventilation, and need for surfactant were recorded. The neonatal outcome such as survival rate, the need for surfactant treatment, requirement of CPAP, and mechanical ventilation was recorded and compared between the one-dose and two-dose ACS groups. Results thus obtained were analyzed statistically.

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Results

Table 1:Distribution of preterm newborns

Parameters	Group I (4)	Group II (30)	Group III (12)	P value
Received 1 dose ACS	2	24	2	0.01
Received 2 doses ACS	2	25	10	0.05
Oxygen support	4	30	12	0.03
RDS	3	9	4	0.02
CPAP	0	15	5	0.01
Mechanical ventilation	4	16	3	0.02
Surfactant	4	21	5	0.04

Table 1,Fig 1 shows that group I had 4, group II had 30 and group III had 12newborn. 2, 24 and 2 received 1 dose ACS and 2, 25 and 10 received 2 doses ACS, 4, 30 and 12 needed oxygen support, 3, 9 and 4 developed RDS, 0, 15 and 5 needed CPAP, 4, 16 and 3 needed mechanical ventilation and 4,21 and 5 required surfactant in group I, II and III respectively. The difference was significant (P< 0.05).

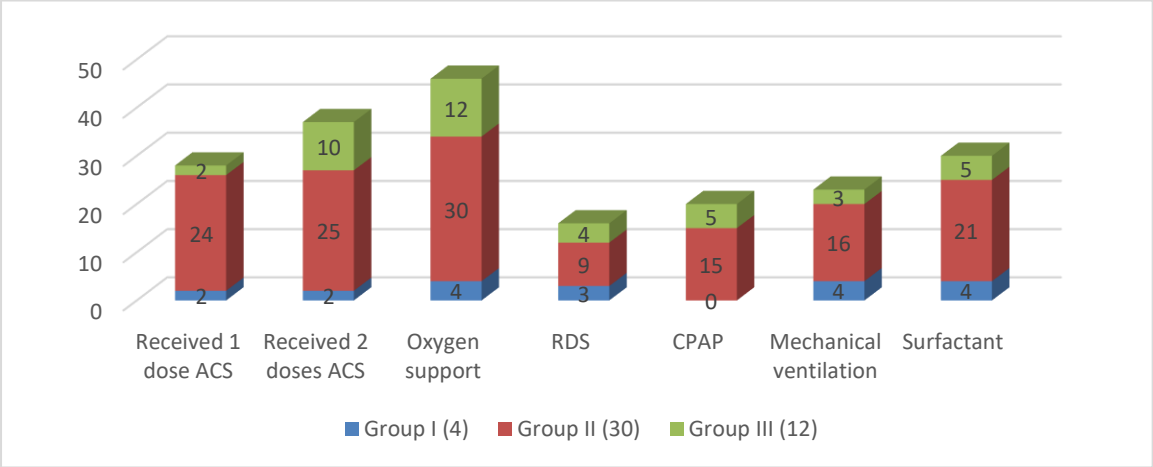

Fig 1:Distribution of preterm newborns

Table 2:Babies with RDS

Babies with RDS	Total	Survived	Died
Pre term babies developed RDS	26	24	2
Preterm babies with RDS received surfactant	30	25	5

Table 2,Fig 2 shows that pre term babies developed RDS were 26 out of which 24 survived and 2 died and preterm babies with RDS who received surfactant were 30 out of which 25 survived and 5 died.

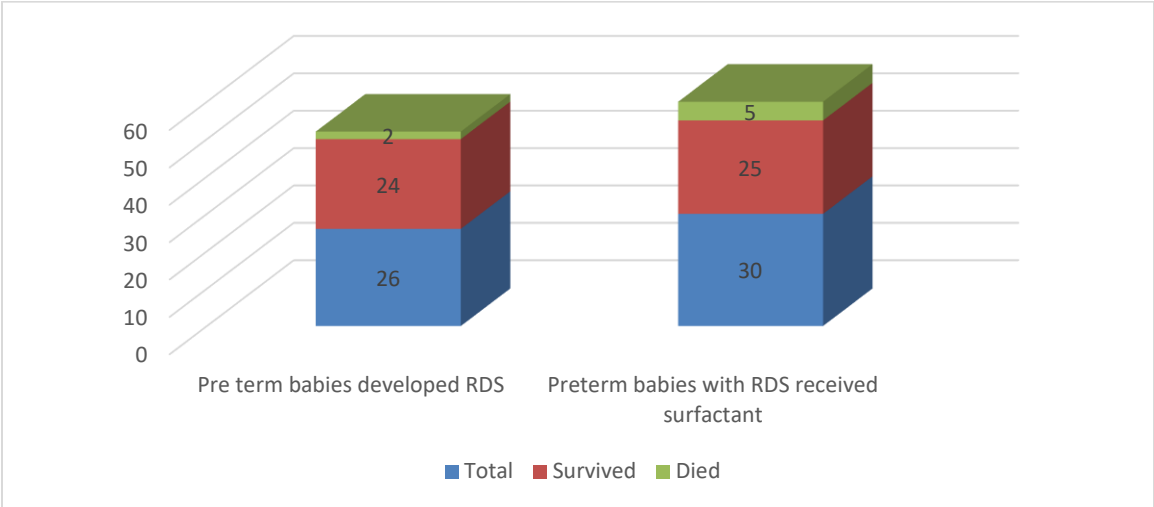

Fig 2:Babies with RDS

Discussion

There are some relatively simple obstetric procedures for preventing the neonatal complications that lead to increases in morbidity, mortality and sequelae among survivors. The use of antenatal corticosteroids for fetal maturation is one of these procedures[7].The National Institute of Health recommended the use of ACS among mothers with gestational age between 24 and 34 weeks to improve the outcome of preterm infants and in particular will reduce the incidence and severity of RDS[8]. Recommendation of ACS treatment consists of two doses of 12 mg of betamethasone given intramuscularly 24 h apart or four doses of 6 mg of dexamethasone given intramuscularly 12 h apart. Several studies regarding repeated courses or weekly courses of ACS for preterm infants to enhance their lung maturation were reported[9].The present study was conducted to assess outcome of acute respiratory distress syndrome in premature babies in mothers on antenatal corticosteroids.

In present study, group I had 4, group II had 30 and group III had 12 newborn. 2, 24 and 2 received 1 dose ACS and 2, 25 and 10 received 2 doses ACS, 4, 30 and 12 needed oxygen support, 3, 9 and 4 developed RDS, 0, 15 and 5 needed CPAP, 4, 16 and 3 needed mechanical ventilation and 4, 21 and 5 required surfactant in group I, II and III respectively. Helijc et al[10]included 172 premature neonates with estimated gestational age between 26 and 34 weeks. Babies with IUGR, babies of diabetic mothers and babies with major congenital defects were excluded. Out of 172 neonates, 80 were treated antenatally with corticosteroids (single course of dexam-ethasone) and 92/172 were not. There was no statistical difference (p>0,5) in average gestational age and male/female ratio between investigated groups; there were significant-ly more male patients in both groups. Frequency of RDS was significantly lower in the corticosteroid group (24/80) in relation to the control group (54/92) (p<0,001). Severe RDS was significantly (p<0,01) more frequent in the control group 34/53 (62,96%) then in the corticosteroid group 6/24 (25,0%). Bovine surfactant (Survanta) was given as a rescue therapy to 78 babies with clinical and radiological signs of RDS who required FiO2>0,40 and mechanical ventilation.

Early surfactant administration within six hours after birth appeared to be effective at reducing mortality then later surfactant administration (p<0,005). In the group of babies requiring FiO2>0,6 at the time of surfactant replacement, the mortality rate was significantly higher (p<0,05).

We found that pre term babies developed RDS were 26 out of which 24 survived and 2 died and preterm babies with RDS who received surfactant were 30 out of which 25 survived and 5 died. Nasreenet al[11] studied the incidence and outcome of RDS in preterm babies. Details of the mothers with a period of gestation 34 weeks or less who had received ACS were recorded. The study population included 749 preterm babies. Among them, 698 (93.2%) mothers received two doses of ACS and 51 (6.8%) received only a single dose of ACS. Neonates whose mothers received two doses of ACS had a significantly lower incidence of RDS, lower rate of mechanical ventilation (45% vs. 72.5%,) and higher survival rate (87% vs. 68.6%, p=0.001) than neonates whose mothers received a single dose of ACS.

The efficacy of neonatal surfactant therapy is enhanced by antenatal exposure to corticosteroids. Although progression of the lung symptoms normally seen in Respiratory Distress Syndrome (RDS) may be modified or halted by ventilatory support, surfactant treatment is still required in about 50% of all premature babies born before 30 weeks gestation[12].

Conclusion

Authors found thattwo doses of ACS 24 hour apart can decrease the incidence of RDS, the need for mechanical ventilation, and increased survival rate of preterm.

Conflict of Interest: Nil
Source of support:Nil

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