Original Article

Effect of Prophylactic Antenatal Cortecosteroid and Incidence of Neonatal Respiratory Morbidity after Elective Cesarean Section in Patients Having Previous Cesarean Section

Munawar Afzal, Humera Bilal and Tasneem Hayat

ABSTRACT

Objective: To assess administration of prophylactic use of corticosteroid 48 hours before elective caesarean section reduces neonatal respiratory morbidity in patients having previous caesarean sections and to see the relationship of neonatal respiratory morbidity with the gestational age at which caesarean section done.

Study Design: Prospective study

Place and Duration of Study: This study was conducted at the Department of Gynaecology and Obstetrics Sughra Shafi Medical Complex Narowal from 1st January to 30th June 2018.

Materials and Methods: This study included one hundred twenty consenting women. These women were scheduled for elective caesarean section and all had previous caesarean delivery, 60 randomized to Group A, who received I/M dexamethasone in 2 doses of 12mg/12 hours apart 48 hours before caesarean section and 60 to Group B who did not receive dexamethasone.

Results: Fourteen infants were admitted to nursery, 4 newborns from the group A and 10 from the group B. Regarding indication of admission in group A only 1 (2%) baby developed RDS to 3(5%) in group B (p=0.0461).Besides 7 (12%) babies were admitted to nursery in group B due to TTN compared to 3 (5%) in Group A (p=0.0361).One baby in Group B expired .Admissions due to neonatal respiratory morbidity were more at 37 weeks than at 38 or 39 weeks. There were 9 at 37 weeks, 4 at 38 weeks and 1 at 39 weeks.

Conclusion: Elective section should be delayed up to 39 weeks and if early term elective section is required, prophylactic dexamethasone 48 hours before caesarean section reduces neonatal respiratory morbidity and can be safely used.

Key Words: Neonatal respiratory morbidity, Transient tachypnea of newborn, Respiratory distress syndrome

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INTRODUCTION

Rate of elective caesarean section is increasing worldwide. Almost it is between 30-40%.[1] Main contribution towards this rise is that management of previous one scar has been changed (1st: there is low threshold for caesarean section in patients having previous one caesarean section due to fear of complications which includes risk of rupture of scar and maternal and fetal complications 2nd: women also request for repeat caesarean section).[2,3]

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Other reasons for this increase practice are breach presentation, improved hemorrhage and infection controlling techniques, increased safety of procedure and reduced threshold for choosing it by obstetricians and strong maternal request.[4,5]

Although maternal risks have decreased but elective delivery by caesarean section is risk factor for neonatal respiratory morbidity both in term and preterm infants.[6] Neonatal respiratory morbidity ranges from TTN of newborn to respiratory failure. This risk of respiratory morbidity is more by caesarean delivery than infants born vaginally. Additional factor which increases the risk is when caesarean section is elective that is before onset of labor and when delivery is before 39 weeks.[7] Multiple studies[8,9] have shown that risk of neonatal respiratory complications is decreasing with advancing gestational age at the time of elective LSCS. The risk at 37+6 weeks is 73.8/1000(7.38%),42.3/1000(4.23%) at 38+6 weeks and 17.6/1000 (1.76%)at 39+6 weeks.[10] The development of neonatal respiratory morbidity leads to admission to neonatal intensive care unit, increase in parental anxiety, separation from the

mother effecting mother child bonding, cost to nursery unit and the risk of complications from invasive procedures and later on increases the risk of asthma in childhood.[11]

In addition to delivery by elective LSCS and gestational age other risk factors that contribute to development of neonatal respiratory disease include type of anesthesia (regional or general), fetal weight, male sex and antenatal maternal disorders like maternal asthma and diabetes.

In order to decrease this complication it is recommended that elective LSCS should be planned at 39+0 weeks.[12] However, approximately 15% of women planned for cesarean section may deliver before 39 weeks and in the presence of specific clinical indications or previous history, early term caesarean section may be required before 39 weeks.

If elective LSCS is considered necessary prior to 39 weeks then prophylactic dexamethasone 48 hours before cesarean section will decrease the risk of NRM.[13]

There is important role of corticosteroids in final maturation of lungs as they increase the number and functions of sodium channels and increase production of surfactant. Antenatal steroids reduce the incidence of respiratory distress to half at 37 -39 weeks of gestation as proven by ASTEC trial.[14]

Multiple studies have shown no adverse effects of single course of corticosteroids for both mother and child.[15]

MATERIALS AND METHODS

This prospective study was conducted in period of 1st January – 30th June 2018 at Sughra Shafi Medical Complex Narowal. It included all women who were planned for EL-LSCS between 37-39 weeks but 120 women met the inclusion criteria and these women were randomly selected. Inclusion criteria for case and control group was the same; it included women delivered by El-.LSCS between 37-39 weeks of pregnancy having previous cesarean section , singleton pregnancies and only women with confirmed dates (by earliest USG or sure of LMP). Exclusion criteria were also the same in both groups and included women with diabetes, IUGR, Preterm babies, multiple pregnancies and congenital malformed babies. Two groups were made. Group A or dexamethasone group comprised data of women who received prophylactic dose of dexamethasone intramuscularly in two doses of 12mg / 12hours apart 48 hours prior to date of cesarean section. Group B comprised data who did not receive dexamethasone. Primary outcome measures were number of babies with neonatal respiratory disease in both groups, and secondary outcome measures were to see the severity of respiratory disease, length of stay in hospital in each group and to compare difference in nursery admission in according to gestational age. Neonatal respiratory morbidity was diagnosed by neonatologist. Data was analyzed by using SPSS 19.

RESULTS

Overall 14 babies admitted with neonatal respiratory morbidity, 10 in group B and 4 in Group A. The incidence of admission with respiratory disease was 17% in Group B and 7% in Group A, a relative risk of 0.54 in favor of treatment. Total 10 babies experienced TTN, only 3 (5%) in Group A and 7 (12%) in Group B while RDS developed in one baby (2%) in Group A versus 3 (5%) in Group B. In 120 patients 27/60(37%) babies were born at 37 weeks working gestation, 26/60(43%) at 38 weeks, 12/60(20%) at 39 weeks. At Gestational age of 37-37+6 weeks total admitted cases were 9, 6 in Group B and 3 in Group A. At Gestational age of 38 – 38+6 weeks admitted cases were 4, there were 3 in Group B and 1 in Group A and at Gestational age of 39 weeks there was no admission in Group A and 1 admission in Group B. Severity of respiratory morbidity and length of hospital stay in babies admitted to nursery was same in both groups. One male baby was expired, his mother did not receive dexamethasone (from Group B) and that elective section was done at 38 weeks (Tables 1-2).

Table No.1: Baseline characteristics of the two studied groups

Baseline characteristics	Group A (n=60)	Group B (n=60)	P-value
Maternal age	30.03±1.06	29.77±3.80	0.292
Gestational age	37.83±0.77	37.38±4.56	0.260
Neonatal gender (male/female)	1.45±0.501	1.52±0.50	0.980
Birth weight(g)	3.13±0.085	3.50±3.22	0.245
Indication of cesarean section			
Prev 1LSCS	28	34	
Prev 2 LSCS	19	11	
Prev 3 LSCS	11	15	
Prev 4 LSCS	2	-	

Table No.2: Outcome of two studied groups and relative risk of dexamethasone group

	Group A	Group B	RR	CI	P-value
No. of babies admitted	4(7%)	10(17%)	0.54	0.31-1.22	0.0432
RDS	1(2%)	3(5%)	0.59	0.11-2.10	0.0461
TTN	3(5%)	7(12%)	0.42	0.13-2.12	0.0361
Mechanical ventilation	Nil (0%)	1(2%)	0.71	0.09-3.21	0.0456
Admission b/w 37-37+6 wks	3(5%)	6(10%)			
38-38+6 weeks	1(2%)	3(5%)			
At 39 weeks	Nil 0%)	1(2%)			
Length of hospital stay	3.2±1.3	3.5±1.71			
Neonatal death	Nil (%)	1(%)			

DISCUSSION

This randomized control trial showed significant relationship of antenatal dexamethasone with neonatal respiratory morbidity for El.LSCS scheduled between 37-39 weeks. Dexamethasone administration reduces the frequency of RDS, TTN or need for mechanical ventilation. Our results are supported by ASTEC trial which showed significant reduction in neonatal respiratory morbidity in dexamethasone group.[14]

Another trial conducted in Pakistan published similar results showing beneficial association between prophylactic dexamethasone and decrease in NRM and NICU admission.[16] Local study in Egypt conducted in 2015 also has similar results.[17]

Results of Cochrane systemic review (2009) on prophylactic administration of corticosteroid before El.LSCS at term showed that there was no significant difference between treatment and control group with regard to the incidence of RDS, TTN and need for mechanical ventilation. There was marked decrease in incidence of neonatal admission to NICU (RR=0.15). The study concluded that more studies with relatively great sample sizes are required for further clarification.[18]

Results of study conducted by Ashraf Nabhan in 2014 were different from our study. This study showed that regarding admission to NICU, respiratory and non respiratory complications there was no significant difference between intervention and control group. The results were different from our study may be due to: dose of dexamethasone (I/M in 4 doses of 6mg/12 hours) used was different and gestation age at elective cesarean was between 34 and 37 weeks.[19]

Our study shows relation of neonatal admission having respiratory morbidity with gestation age, as there were 9 admissions at gestation age of 37-37+6 weeks (3 in group A and 6 in Group B), 4 admissions at gestation age of 38-38+6 weeks (1 in Group A and 3 in Group B) and 1 admission at 39 weeks(nil in Group A and 1 in Group B).Another study conducted in 2014 revealed that no. of admission was same at 37-37+6 weeks and 38-38+6 weeks, while there was no admission at 39 weeks.[20] Another study in Hong Kong showed that risk of neonatal respiratory morbidity was significantly increased in those delivered by El.LSCS before 38 weeks.[21]

In this study one baby was expired, that baby was from group B & delivered at 38 weeks. Use of antenatal steroid between 37-38^{+6} week may decrease neonatal respiratory morbidity by different mechanisms. They may act by promoting molecular mechanism predominantly by increasing number and function of lung Na channel that allow alveolar fluid drainage. Fetuses which are not exposed to process of labor may have underactive Na channel. Antenatal corticosteroids may also increase the responsiveness to catecholamine and thyroid hormones, providing reason for their administration in cases of elective caesarean section.[22]

CONCLUSION

According to findings of current study we conclude that elective LSCS should be planned as close to 39 weeks as possible, but in the cases where early term elective LSCS is deemed necessary, prophylactic dexamethasone 48 hours before caesarean section was found to reduce neonatal respiratory morbidity, it also decreases the number of admissions to NICU, so decreasing the cost of cure. Dexamethasone as prophylaxis is inexpensive, easy to administer and drug can be used safely in two doses 12 hours apart.

Author's Contribution:

Concept & Design of Study:	Munawar Afzal
Drafting:	Humera Bilal
Data Analysis:	Tasneem Hayat
Revisiting Critically:	Munawar Afzal, Humera Bilal
Final Approval of version:	Munawar Afzal

Conflict of Interest: The study has no conflict of interest to declare by any author.

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