Elective Cesarean Section for Preterm Fetuses in Vertex Presentation: Is It Effective to Improve The Neonatal Outcomes?

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OBJECTIVE: Evaluation of the assumption that elective cesarean section (CS) improved neonatal outcomes of 'preterm fetuses in vertex presentation'.
STUDY DESIGN: Birth records of a university hospital between 1999 and 2004 were reviewed. CS performed without a trial of labor before completion of 37 gestational weeks were included in the study group. Early neonatal and maternal outcomes were compared for the elective CS and vaginal birth groups.
RESULTS: 61 elective CS and 117 preterm vaginal deliveries were eligible for the analysis. Neither the rate of NICU admission (38% versus 33%) nor the neonatal mortality rate (3.3% versus 4.3%) differed significantly. There were 2 cases of maternal morbidity in the CS group but none in the vaginal birth group.
CONCLUSIONS: Data in this study did not demonstrate any beneficial effect of elective CS for the early neonatal outcome of preterm fetuses in vertex presentation despite the possible increase in maternal morbidity.
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Key Words: Preterm birth, Delivery, Elective cesarean section, Morbidity, Mortality

The elective cesarean sections have the rationale of improving the neonatal outcomes in the case of a preterm delivery by avoiding the potential birth trauma during the vaginal birth.[1] Cesarean sections performed without a trial of labor before the completion of 37 gestational weeks can be labeled as 'elective'.[2]

Any cesarean section performed for a preterm fetus can not exclusively depend on patient's desire, so can not be really 'elective' but when delivery is inevitable as a consequence of a fetal or maternal indication, cesarean section without a trial of labor can be assigned as 'elective'. This can be either the patient's or the physician's preference. The term 'selective' is reserved for the cesarean sections performed with an obstetric indication arising during the course of a trial of vaginal delivery.[3] Elective and selective cesarean sections are two different entities and must be considered as if two different modes of delivery when evaluating the maternal and fetal consequences.

This study was designed for the evaluation of the assumption that elective cesarean section improved the early neonatal outcomes of the 'preterm fetuses even in the vertex presentation'.

Material and Methods

Birth records of Cerrahpasa Medical Faculty, Istanbul University, between 1999 and 2004 were reviewed retrospectively. In the study period, 11480 live births in 26-42 gestational weeks were documented. The records of preterm deliveries between 26-37 gestational weeks, a total of 984 cases, were enrolled for further evaluation. As this review conforms to the standards established by the NHMRC for ethical quality review,[4] ethics approval was not sought.

Age, obstetric and medical histories of each case was recorded. The record of last ultrasound examination was reviewed; estimated fetal weight and amniotic fluid volume were noted. The indication for cesarean delivery was confirmed. The birth weight of the baby was determined and the growth percentile for the gestational week was also calculated.

For the purpose of extracting the elective cesarean sections, the cesarean section procedures performed with an obstetric indication; preterm breech presentation, previous cesarean section, fetal distress, cephalopelvic disproportion, transverse lie, placenta previa, ablatio placenta (267 cases) were excluded from the investigation. The operative vaginal deliveries; vacuum or forceps (five cases) and breech deliveries (18 cases) were also excluded. In addition, the data of 97 vaginal deliveries was also excluded as the labor was induced with oxytocine. Furthermore, large for gestational age (LGA) (20 cases) and small for gestational age (SGA) or intrauterine growth retarded (IUGR) babies (140 cases) were also excluded from the analysis.

After the exclusion of the aforementioned cases, 178 preterm deliveries formed the study population.

The records of remaining 117 spontaneous vaginal deliveries and 61 elective cesarean sections were reviewed and analyzed. The cesarean section group and the vaginal birth group were compared with respect to early neonatal outcomes and maternal morbidity.

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Table 1. The comparison of the maternal and fetal parameters in the vaginal birth and elective cesarean section groups.

	Vaginal Birth (n=117)	Cesarean Section (n=61)	F	p
Age (year)	26.2±5.1	28.2±5.5	5.819	0.017*
Gestations (n)	2.4±1.9	2.8±2.1	1.748	0.188
Births (n)	0.9±1.3	1.0±1.2	0.134	0.715
Birth weight(g)	1982±431	1921±462	0.761	0.384
Estimated fetal weight(g)	2001±478	1942±539	0.561	0.455
Gestational week at birth	32.5±2.5	32.1±2.5	0.751	0.387

* p<0.05: Statistically significant

Table 2. The distribution of neonatal outcomes of the preterm births in the vaginal birth and elective cesarean section groups.

	Neonatal Outcome	Mode of Delivery						p
		Vaginal Birth		Cesarean Section		Total		
		N	%	N	%	N	%	
1	Healthy at mother's bedside	22	18.8	14	23.0	36	20.2	0.513
2	Primary nursery	52	44.4	22	36.1	74	41.6	0.282
3	NICU admission	38	32.5	23	37.7	61	34.3	0.486
4	Early neonatal exitus	5	4.3	2	3.3	7	3.9	0.746
Total		117	100.0	61	100.0	178	100.0	

The neonatal outcome was classified in four groups: group one, at mother's bedside; healthy babies that can manage breast feeding with no respiratory problems, group two at primary nursery; healthy babies experiencing slight problems with feeding and/or respiration, followed without active cardiopulmonary support , group three, admitted to neonatal intensive care unit (NICU) in the early neonatal period (within the first seven days of the delivery) for active cardiopulmonary support and/or infection, group four, exitus; if the baby died in the early neonatal period. The postoperative records of the cases until their discharge from the hospital were reviewed to reveal the maternal morbidity.

The data was collected in a computer based database. The statistical analysis was performed with SPSS program (version 11.5), χ-square test (Fishers' exact test when indicated) and one-way ANOVA test. $P<0.05$ was accepted as statistically significant.

Results

Demographical data of the elective cesarean group (n= 61) and the vaginal birth group (n=117) is presented in Table 1. Cesarean group was significantly older than the vaginal birth group (28.21 versus 26.20) whereas all the other parameters were equivalent.

There were three cases of maternal cardiac disease (NYHA Class I) in the vaginal birth group (2.6%) and two cases (3.3%) in the cesarean section group. Gestational diabetes was diagnosed in six cases in vaginal birth group (5.1%) compared to four cases in the cesarean section group (6.5%). The remaining cases were reported as rheumatoid arthritis, Familial Mediterranean Fever, idiopathic thrombocytopenic purpura, tuberculosis and hyperprolactinemia in the vaginal birth group (one case each) and there were two cases of hypothyroidism and one case of tuberculosis in the cesarean section group.

The rate of NICU admission was higher in the cesarean group (37.7% versus 32.5%) whereas early neonatal death rate was higher in the vaginal birth group (4.3% versus 3.3%) but the differences between the groups were not statistically significant (Table 2).

There were two cases of maternal morbidity in the cesarean group. One patient was diagnosed to have a profound anemia with hemoglobin level of 8.4 g/dl on postoperative day two (Preoperative hemoglobin level was 10.6 g/dl). The other case had an incision infection diagnosed on postoperative day four. She was given intravenous antibiotics, daily incision care and was discharged on postoperative day nine. Despite these two morbidities in the cesarean group, there was not any complicated case in the vaginal delivery group. Any statistical evaluation could not be computed on the maternal morbidity.

Discussion

The elective cesarean section rates are increasing in all over the world with a remarkable contribution of the procedures performed for the preterm fetuses.[1,3] The ethics and the cost-benefit analyses of elective cesarean section have been an ongoing controversy but this is not in the scope of this article.

The implication of performing an elective cesarean section for the preterm fetus arises from the proposal that the vaginal birth may be detrimental to the premature fetus. The policy of the elective cesarean section for the preterm breech delivery is widely accepted even though the evidence is not confirmatory; mostly depend on retrospective studies,[3] but there is almost no evidence on the mode of delivery of the fetuses in the vertex presentation. Even though there is not any qualified evidence validating the importance of mode of delivery in the management of preterm fetuses, it is difficult to perform a randomized controlled trial on the subject as addressed by different authors before.[1,3,5] This is mainly as a result of the recruitment problems.

Our study is a retrospective one, having a historical cohort design. The historical design is obviously a disadvantage of this study since any randomization can not be performed but the study groups were carefully examined in order to minimize the biases. The only parameter that was not equally distributed was the age of the mothers in the study and control groups. We do not believe this difference cause a bias on the results of the study because the groups were similar according to all fetal parameters (Table 1).

There are only six studies reviewed about the selection of the mode of delivery for the preterm fetuses in which only 122 patients are included in the Cochrane Database of Systematic Reviews.[6-12] All of the studies were terminated earlier than intended because of the recruitment problems. The babies in the elective cesarean group were found to have less respiratory distress syndrome although they had lower cord pH immediately after delivery.[1] Neonatal seizures were less in the cesarean group and there were fewer deaths.[6] However, the mothers were prone to have serious morbidity.[6]

The results of our study did not demonstrate any significant beneficial effect of performing an elective cesarean section for improving the neonatal outcomes of preterm fetuses compared to vaginal birth. It must be admitted that there were fewer neonatal deaths in the cesarean birth group but the NICU admission rates were higher following the elective cesarean sections. This indicates that elective cesarean section was not effective enough for protecting the preterm babies from the serious morbidity. In the case of a preterm birth, the obstetrician should provide a meticulous care on the fetal growth and well-being. The appropriate timing and the mode of delivery should be determined regarding the gestational age and the fetal condition rather than the individual preferences.

Our data is not large enough to emphasize the possibly higher maternal morbidity rates as the result of the elective cesarean procedures but the two cases of maternal morbidity (one with anemia and the other with infection) can be a hint for the higher rates in larger groups. As a proposed mode of delivery to decrease the neonatal morbidity and mortality in preterm birth, elective cesarean section does not have sufficient evidence-based support in the current literature. The retrospective data presented in this study, like the previous studies does not present any evidence to support the utilization of elective cesarean section in the management of preterm deliveries for the purpose of achieving better neonatal outcomes and the increased maternal morbidity due to cesarean section is still a problem.

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