

Caesarean section for foetal distress and correlation with perinatal outcome

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Abstract

Objective: To find out the efficacy of continuous fetal heart monitoring by analyzing the cases of cesarean section for non-reassuring fetal heart in labor, detected by cardiotocography (CTG) and correlating these cases with perinatal outcome. **Methods:** This was a prospective observational study of 200 patients who underwent cesarean section at 36 weeks for non-reassuring fetal heart in labor detected by CTG. The adverse immediate neonatal outcomes in terms of Apgar score <7 at 5 minutes, umbilical cord pH <7.2, neonates requiring immediate ventilation and NICU admissions were recorded. The correlation between non-reassuring fetal heart and neonatal outcome was analyzed. **Results:** Out of the 1010 caesarians, 200 (15.54%) are being performed for non-reassuring fetal heart rate. The mean age of the patients in the study group was 24.1 years. 128 (64%) women were primigravida, 72 (36%) were multigravida. Only 29 (14.5%) actually shows poor neonatal outcome with NICU admission. **Conclusion:** Non-reassuring fetal heart rate detected by CTG did not correlate well with adverse neonatal outcome.

Key Word: Foetal distress, perinatal outcome.

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foetal heart rate patterns are associated with adverse perinatal outcome.

MATERIALS AND METHODS

This was a prospective observational study done in SMGS hospital in May, April 2018. A total of 200 women were included in the study who underwent emergency caesarean section for foetal distress during labour as detected by cardiotocography and not responding to intrauterine resuscitation. Intrauterine resuscitation included change in maternal position, oxygen administration and intravenous hydration.

Inclusion Criteria

1. Caesarian section delivery;
2. Term gestation (at 36 weeks or above);
3. Cephalic presentation.
4. Live birth.
5. Singleton pregnancies.

Exclusion Criteria: Were congenital anomalies, abnormal presentation, multiple gestation and gestational age < 36 weeks, low birth weight. Maternal age, parity, associated high-risk factors and abnormal foetal heart rate patterns which led to the diagnosis of caesarean section were recorded. Birth weight, foetal Apgar score at 1 and 5

INTRODUCTION

Foetal distress detected by cardiotocography (CTG) has been the most common indication for caesarean section (CS) for the past few decades. Many fetuses show heart rate changes without showing poor outcome and CTG has been criticized to create an unnecessary high rate of operative deliveries.^{1,2,3} Hence, there is a need to assess the efficacy of electronic foetal monitoring. Keeping this issue into consideration, this study was undertaken to analyse the correlation between caesarean section for foetal distress and perinatal outcome and to see what

min and umbilical artery pH at birth were recorded. Neonatal outcome was studied with regard to the need for supportive ventilation and admission to NICU/nursery.

RESULTS

This study was conducted in SMGS hospital from April to May 2018, a total number of 2039 patients were delivered at ≥ 36 -week gestation. Out of these, 200 (15.54%) patients underwent emergency caesarean section primarily for non-reassuring foetal heart rate patterns, while the total number of caesarean sections for various indications was 1010. The mean age of the patients in the study group was 24.1 years. 128 (64%) women were primigravida, 72(36%) were multigravida. The various foetal heart abnormalities picked up by CTG for which caesarean section was done and associated neonatal outcome are given in Table 1. The most common foetal heart abnormality of foetal distress detected by CTG found was persistent bradycardia in 125cases followed by late deceleration in 39 cases and variable deceleration in 31 cases. There were 20 (10 %) patients who had more than one foetal heart abnormality. In our study, 14.5 % (29/200) of cases diagnosed with foetal distress subsequently had a poor outcome. Out of 200 patients of caesarean section for suspected foetal distress, the 1-min Apgar score was <4 in 15 women, while the 5-min Apgar score was <7 in 29 women. Twenty-nine babies required immediate resuscitation and were admitted in NICU. There were five cases of severe birth asphyxia (Apgar score <4 at 5 min); of these, three babies died. The indication of caesarean section was severe msland antepartum hemorrhage with abruption, respectively. The foetal heart abnormality was persistent bradycardia in both the cases, while the cord pH was 6.12 and 6.95, respectively. There were 125 (85.6 %) neonates who did not show any adverse outcome. We also analysed the intraoperative finding and associated complications in these women and compared the neonatal outcome in cases with associated

Table 1: Various foetal heart abnormality and related adverse neonatal outcomes

Foetal heart Abnormalities	Number of patients	Adverse neonatal outcome		
		AS <7 at 5 min	Cord pH <7.20	NICU admission
Persistent Bradycardia	125(62.5%)	18	7	18
Variable Decelerations	31(15.5%)	4	2	4
Late decelerations	39(19.5%)	5	2	5
Tachycardia	5 (2.5 %)	2	1	2

Table 2: Relation of neonatal outcome with associated risk factor

Associated high risk factor	Total number of cases	NICU admission
Meconium stained liquor	35	11
Oligohydroamnious	10	3
Cord around neck	6	3
Second stage of labor	6	2
Antepartum hemorrhage	2	1

Complicating factors with those who had no risk factor. Associated complicating factors included antepartum haemorrhage, oligohydramnios, hypertensive disorders of pregnancy, cord prolapse, cord loop around neck, meconium staining of amniotic fluid and second stage arrest. In 141 (70.5 %) cases, there was no associated risk factor, while the remaining 59 (29.5 %) had one or more associated complicating factors. In 59 (29.5%) patients operative findings did support the clinical diagnosis of jeopardized fetus but in 141 (70.5%) cases no evidence of fetal distress was found during surgery and most of these had the diagnosis based on CTG readings. The most common operative finding was the presence of meconium detected in 35 (17.5%) patients, followed by decreased or absent liquor in 10 (5%), loops of cord around fetal neck in 6, delivered during second stage of labor in 6 and marked placental separation in 2 cases. Poorest neonatal outcome was found in those cases who had only paste like meconium without any liquor Twenty foetuses were admitted in NICU or needed supportive ventilation in women with associated risk factors, while only nine foetuses in those with no associated risk factors. Hence, the neonatal outcome was poorer if there were associated complicating factors and this was found to be statistically significant using chi square test. ($p < 0.001$). The outcome was worst in babies with meconium stained liquor with maximum number of babies (50 %) in this group requiring resuscitation and admission in NICU.

DISSCUSSION

Continuous electronic foetal monitoring is the most common form of intrapartum foetal assessment used currently⁴. When electronic fetal heart monitoring by cardiotocography was introduced, the aim was to identify fetuses affected by hypoxia during labor better. But no benefit in long term neonatal outcome has been shown and cesarean section rates have been reported to be increased by four folds^{3,5}. Various studies^{6,7} implicate that CTG interpretation is inconsistent, is at times inaccurate, may fail to predict early neonatal outcome and is subject of influence by the medicolegal climate. As observed in our study, the rate of caesarean section for foetal distress was 15.54 %, and out of this, only 14.5 % foetuses were actually distressed implying the limitation of cardiotocography in predicting early neonatal outcomes on the basis of non-reassuring foetal heart rate patterns.

Hence, the prediction of foetal hypoxia and acidosis on the basis of non-reassuring foetal heart rate patterns is sufficiently low to have led to the observation that many caesarean deliveries are retrospectively found to have been unnecessary. It has also been observed in various studies that CTG interpretation is inconsistent and may fail to predict early neonatal outcome⁸. The role of the more invasive foetal scalp blood sampling to determine pH values has been challenged, and it is not used as commonly as in the past⁹. The increased citation of foetal distress as an indication of caesarean section during the last two decades raises the suspicion that electronic foetal monitoring interpretation has become more reflective of the legal climate than of the foetal condition⁸. Various randomized controlled trials^{10,11} showed that addition of ST analysis to conventional CTG improved the specificity of intrapartum monitoring and thereby reducing the rate of operative deliveries for fetal distress. Recently Vayssiere *et al*¹² in 2007 reported that, in a population with abnormal fetal heart rate in labor ST-segment analysis (STAN) sensitivity is moderate (almost 40%) for predicting pH = 7.15 and better (almost 60%) for severe acidosis (pH <7.05). Therefore we strongly feel, fetal ECG system needs to be introduced in addition to conventional CTG wherever possible including our Centre to reduce the rate of unnecessary cesarean section at term for nonreassuring fetal heart. Hence, the use of such ancillary methods in addition to CTG is the way forward. Moreover in over study, neonatal outcome was poor if there was associated complicating factors. So, we should improve our clinical skills and knowledge so that intervention for truly compromised fetuses must not be delayed in order to avoid neonatal morbidity and mortality.

CONCLUSION

More number of caesarean sections are being performed for foetal distress. Adverse neonatal outcome did not correlate well with non-reassuring fetal heart detected by CTG. High incidence of unnecessary cesarean section rate at ≥ 36 weeks during labor was a result of that. On the other hand, it could reflect decisions were made at a time before clinically significant foetal compromise occurs. Moreover in today's obstetrics play safe practice is preferred. The correlation was, however better in women with associated complicating factors as there was

significantly higher NICU admission rate in babies born to them. Hence the diagnosis of fetal distress should not be based on a single parameter thus eliminating the risk of overdoing caesareans.

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