ORIGINAL RESEARCH PAPER

Gynaecology

EMERGENCY CAESAREAN SECTION FOR FETAL DISTRESS AND CORRELATION WITH PERINATAL OUTCOME IN A TERTIARY CARE HOSPITAL

Dr. V.Sitalakshmi	M.d., Professor, Dept Of Obstetrics And Gynaecology, Narayana Medical College And Hospital, Nellore.
Dr. Pula Rajeswari*	Post Graduate, Dept of Obgy, NMCH. *Corresponding Author

BACKGROUND: The main documented indication of the intrapartum cesarean section is fetal distress. Fetal distress indicates fetal hypoxia and acidosis during intrauterine life.

PURPOSE: To correlate the diagnosis of fetal distress with the perinatal- outcome.

METHODS: This was a prospective observational study of women who underwent a cesarean section for fetal distress as detected by CTG and not responding to intrauterine resuscitation. The fetal Apgar score at 1 and 5 min was recorded, cord blood pH was measured in all cases. The baby outcome was studied in terms of the need for supportive ventilation and admission to the NICU/nursery.

RESULTS: In our study, 13.59% of cases diagnosed with fetal distress subsequently had a poor outcome. Eleven babies had a 5-min Apgar score <7, required immediate resuscitation and were admitted to NICU. Six fetuses had a 1-min Apgar score <4, while there were three cases of severe birth asphyxia (Apgar score <4 at 5 min); of these, two babies died. The neonatal outcome was poorer in cases with associated complicating factors.

CONCLUSION: The diagnosis of fetal distress is imprecise and a poor predictor of the fetal outcome-the result is a tendency for unnecessary cesarean sections. On the contrary, the lack of adverse outcomes could reflect that our unit makes decisions at a time before a clinically significant fetal compromise occurs.

INTRODUCTION

The most common indication of the intrapartum cesarean section is fetal distress for the past few decades[1,2]. The diagnosis of fetal distress made based on fetal heart rate abnormalities as detected by electronic fetal monitoring has led to a high rate of cesarean deliveries without the fetuses being adversely affected[3-5]. This high rate of cesarean section for fetal distress is attributed to the widespread use of electronic fetal monitoring for diagnosing abnormal fetal heart rate patterns[6]. However, not all fetuses with the abnormal fetal heart rates detected on CTG have adverse outcomes at birth.

So, there is a need to assess the efficacy of EFM. Keeping this issue into consideration, this study were undertaken to analyze the correlation between cesarean section for fetal distress and perinatal outcome and to see what fetal heart rate patterns are associated with adverse perinatal outcomes.

MATERIALS AND METHODS

The present study is a prospective observational study done in our hospital, which is a referral Centre. A total no. of 81 women were included in the study who underwent an emergency cesarean section for fetal distress during labor as detected by CTG and not responding to intrauterine resuscitation. Intrauterine resuscitation included changes in the maternal position, oxygen administration, and intravenous hydration. Exclusion criteria were congenital anomalies, abnormal presentation, multiple gestations and gestational age <36 weeks.

Maternal age, parity, high-risk factors, and abnormal fetal heart rate patterns which led to the diagnosis of cesarean section, were recorded. Birth weight, fetal Apgar score at 1 and 5 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

From October 2018 to May 2019, a total number of 4132 patients were delivered in our hospital at ≥36-week gestation. Out of these, 81 (18.024 %) patients underwent emergency cesarean section primarily for non-reassuring fetal heart rate patterns, while the total number of cesarean sections for various indications was 478.

The mean age of the patients in the study group was 23.5 years. Forty-Two (51.85 %) women were prim gravida, 33 (40.74 %) were gravida 2, while 6 (7.40 %) were gravida three or more.

The various fetal heart abnormalities picked up by CTG for which cesarean section was done, and associated neonatal outcomes are given in Table 1.

TABLE 1
Various fetal heart abnormality and related adverse neonatal outcomes

Fetal heart abnormality	No of Patients	Adverse Neonatal outcome		
		AS<7 at 5min	Cord PH <7.20	NICU Admission
Persistent bradycardia	51 (62.96%)	6	3	6
Variable decelerations	9 (11.11%)	2	2	2
Late decelerations	17 (20.98%)	2	1	2
Tachycardia	4 (4.93%)	1	1	1

The most common fetal heart abnormality of suspected fetal distress found was persistent bradycardia in 51 cases followed by the late deceleration in 17 cases and variable deceleration in 9 cases. There were 7 (10.9 %) patients who had more than one fetal heart abnormality.

In our study, 13.59 % (11/81) of cases diagnosed with fetal distress subsequently had a poor outcome. Out of 81 patients of cesarean section for suspected fetal distress, the 1-min Apgar score was <4 in 6 women, while the 5-min Apgar score was <7 in 11 women. Eleven babies required immediate resuscitation and were admitted to NICU. There were three cases of birth asphyxia (Apgar score <4 at 5 min); of these, two babies died, one after 15 min of birth and the second one on day five. The indication of the caesarean section was severe preeclampsia and antepartum hemorrhage with Placenta Previa, respectively. The fetal heart abnormality was

persistent bradycardia in both the cases, while the cord pH was 6.12 and 6.95, respectively. There were 70 (86.41 %) neonates who did not show any adverse outcome.

We also analyzed the intraoperative findings, fetal birth weight and associated complications in these women and compared with the baby outcome in cases with associated complicating factors with those who had no risk factor. Associated complicating factors included antepartum hemorrhage, IUGR, oligohydramnios, hypertensive disorders of pregnancy, cord prolapse, cord loop around the neck, meconium staining of amniotic fluid and second stage arrest. In 59 (72.83 %) cases, there was no associated risk factor, while the remaining 22 (27.16 %) had one or more associated complicating factors. Seven fetuses were admitted in NICU or needed supportive ventilation in women with associated risk factors, while only four fetuses in those with no associated risk factors.

Hence, the neonatal outcome was poorer if there were associated complicating factors (Fig. 1), and this was found to be statistically significant using the χ^2 test. ($p < 0.001$). The outcome was worst in growth-restricted babies with the maximum number of babies (50 %) in this group requiring resuscitation and admission in the NICU (Fig. 2).
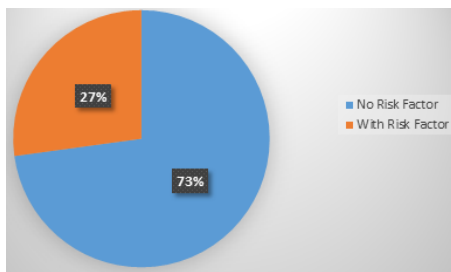

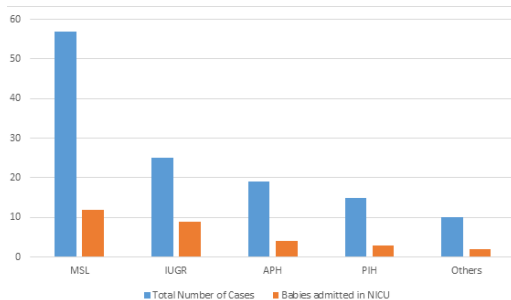**Fig.1 Neonatal outcome in cases with risk factor and No risk factors**

Fig.2 Relation of neonatal outcome with associated high-risk factors

DISCUSSION

Continuous electronic fetal monitoring is probably the most common form of intrapartum fetal assessment used currently[7]. It is a widely accepted method of fetal monitoring during labor to identify fetuses with hypoxia during labor. However, the main risk of widespread application of continuous monitoring has been the increased risk of cesarean delivery noted in retrospective and prospective studies[8,9].

As observed in the present study, the rate of cesarean section for fetal distress was 18.02 %, and out of this, only 13.59 % fetuses were actually distressed implying the limitation of cardiotocography in predicting early neonatal outcomes on the basis of non-reassuring fetal heart rate patterns.

Hence, the prediction of fetal hypoxia and acidosis based on non-reassuring fetal heart rate is sufficiently low to have led to the observation that many cesarean 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 outcome[10].

The role of the more invasive fetal scalp blood sampling to examine pH values has been challenged, and it is not used as commonly as in the past[11].

The increased citation of fetal distress as an indication of cesarean section during the last two decades raises the suspicion that electronic fetal monitoring interpretation has become more reflective of the legal climate than of the fetal condition[10].

This limitation of CTG in predicting adverse neonatal outcomes has led to the development of newer technologies like ECG to improve the predictive value of fetal monitoring. Currently, the use of ST analysis of the fetal ECG in conjunction with conventional CTG has been shown to reduce both the rates of operative deliveries for fetal distress and metabolic acidosis during birth[12].

It has been observed in various randomized controlled trials that the use of fetal ECG in conjunction with CTG has improved the specificity of intrapartum fetal monitoring leading to a reduction in rates of operative deliveries for fetal distress. Hence, the use of such ancillary methods in addition to CTG is the way forward.

CONCLUSION

In the present study that the abnormal fetal heart rate patterns detected by CTG do not correlate with early neonatal outcomes resulting in a high rate of unnecessary cesarean deliveries. The correlation was, however, better in women with associated complicating factors as there were significantly higher NICU admission rates in babies born to them.

The present study, therefore, implies three things. Firstly, increasing numbers of cesarean sections are being performed for fetal distress. Secondly, the diagnosis of fetal distress is imprecise, and it is a poor predictor of fetal outcome. Finally, the result is an increased number of unnecessary cesarean deliveries.

On the contrary, the lack of adverse outcomes could reflect that our unit makes decisions at a time before a clinically significant fetal compromise occurs.

The use of other modalities like fetal ECG as an adjunct to CTG may help in improving the predictive value of fetal monitoring. Besides, an overall assessment of the patient's details may help to differentiate between fetuses that require prompt delivery and the fetus not actually in acute distress.

REFERENCES
1. MacKenzie IZ, Cooke I. Prospective 12 months study of the 30-minute decision to delivery intervals for "emergency" cesarean section. BMJ. 2001;322:1334–1335. DOI: 10.1136/bmj.322.7298.1334. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
2. Tufnell DJ, Wilkinson K, Beresford N. Interval between, decision and delivery of the baby by cesarean section—Are current standards achievable? Observational case series. BMJ. 2001;322:1330–1333. DOI: 10.1136/ bmj.322.7298.1330. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
3. Hornbuckle J, Vail A, Abrams KR, et al. Bayesian interpretation of trials: the example of intrapartum electronic fetal heart rate monitoring. Br J Obstet Gynaecol. 2000;107:3–10. DOI: 10.1111/j.1471-0528.2000.tb11571.x. [PubMed] [CrossRef] [Google Scholar]
4. Oloffson P. status of intrapartum fetal monitoring: cardiotocography versus cardiotocography + ST analysis of the fetal ECG. Eur J Obstet Gynecol Rep Biol. 2003;110:S113–S118. DOI: 10.1016/S0301-2115(03)00181-7. [PubMed] [CrossRef] [Google Scholar]
5. Nielson JP, Grant AM. Randomized trials of intrapartum electronic fetal rate monitoring. In: Spencer JA, Ward RH, editors. Intrapartum fetal surveillance. London: RCOG Press; 1993. [Google Scholar]
6. American Colg of Obstetricians and Gynaecologists (ACOG Practice Bulletin No. 106: Intrapartum FHR monitoring: nomenclature, and interpretation, and general management principles. Obstet Gynecol. 2009;114(1):192–202. DOI: 10.1097/AOG.0b013e3181aef106. [PubMed]

[CrossRef] [Google Scholar]
7. American college of obgy FHR patterns: monitoring, interpretation and management. American College of Obst and Gynaecology Technical Bulletin. 1995;207:182–189. [Google Scholar]
8. Thacker SB, Strout D, Chang M. Continuous EFHR monitoring for assessment during labor. Cochrane Database Syst Rev. 2001;2:CD000063. [PubMed] [Google Scholar]
9. Neilson JP. Fetal (ECG) for fetal monitoring in labor. Cochrane Database Syst Rev. 2003;2:CD000116. [PubMed] [Google Scholar]
10. Dellinger EH, Boehm FH, Crane MM. Electronic FHR monitoring: early neonatal outcomes associated with normal rate, fetal stress, and fetal distress. Am J Obstet Gynecol. 2000;182:214–220. DOI: 10.1016/S0002-9378(00)70515-1. [PubMed] [CrossRef] [Google Scholar]
11. Goodwin TM, Milner Masterson L, Paul R. Eli of fetal scalp blood sampling on a large clinical service. Obgy. 1999;83:971–974. DOI: 10.1097/00006250-199406000-00015. [PubMed] [CrossRef] [Google Scholar]
12. Amer-Walin I, Hellsten C, Noren H, et al. Cardiotocography only versus cardiotocography plus ST analysis of fetal ECG for intrapartum fetal monitoring: a Swedish randomized controlled trial. Lancet. 2001;358(9281):534–538. DOI: 10.1016/S0140-6736(01)05703-8. [PubMed] [CrossRef] [Google Scholar].