Original Article

FETAL OUTCOME AFTER EMERGENCY CESAREAN SECTION DUE TO NON-REACTIVE CARDIOTOCOGRAPHY

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ABSTRACT

Background: Cardiotocography (CTG) is one of the most popular methods of monitoring the fetus before and during birth. Non-sedative CTG at birth has been linked to meconium staining, low birth weight, and the need for prompt obstetric intervention for optimal outcomes for mother and fetus. The study aimed to assess the fetal outcome after emergency cesarean section due to non-reactive cardiotocography in females presenting at term for delivery.

Material and methods: This descriptive study corss sectional was conducted in Department of Obstetrics and Gynaecology, Jinnah Hospital, Lahore. The time allocated for the study was from 23-07-2015 to 22-01-2016. This study included 200 patients, including females, who underwent emergency cesarean section under spinal anesthesia by a single surgical team. After birth, Apgar score was assessed at 5 minutes of birth. If the score was <7 after 5 minutes, then a poor Apgar score was labeled.

Results: The mean age of the patients was 30.03±7.64 years. The mean gestational age was 38.75±1.65 weeks and the mean Apgar score was 7.56±1.41. According to parity distribution, 106 (53.0%) were nulliparous while 94 (47.0%) were multiparous. A good Apgar score was seen in 169 patients (84.5%) and a poor Apgar score was observed in 31 patients (15.5%).

Conclusion: The results of this study show that a cesarean section done only based on data attained via CTG monitoring does not create a great advantage for the welfare of the fetus. It is often falsely positive and needlessly surges the incidence of the cesarean section without maternal and fetal health benefits.

Key Words: Caesarean Section, Cardiotocography, Pregnancy

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INTRODUCTION

In many parts of the world, the total cesarean section rates have increased with time, especially in primigravidas. Future obstetric performance is dependent on the outcome of the first pregnancy. This aspect of women's health is not given appropriate significance, unfortunately. Factors implicated are the unavailability of health facilities, illiteracy, poor information about the significance of antental care and the non-availability of a proper referral system. Moreover, additional factors responsible for inadequate antenatal care include misapprehensions about the medical management of pregnancy and religious and cultural beliefs. In primigravidas, the cesarean section rate was more (57.5%) than in multigravidas (42.6%).[1]

Intrauterine fetal monitoring aims to identify fetuses at risk of injury as a result of asphyxia in the neonatal period and later in life. Fetal control with CTG was introduced in the 1960s. Although the beneficial effects of cardiotocography on neonatal outcomes have

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never been demonstrated, they are widely used.[2]

A reactive CTG on admission is less significant for undesirable fetal outcomes than CTG done before delivery. Therefore, it is sensible to encourage close fetal monitoring, and well-timed obstetric intervention for best maternal and fetal outcomes as a CTG at delivery is linked with reduced birth weight and meconium-stained liquor.[3]

One study reported that in emergency cesarean section cases due to non-reactive CTG, the poor Apgar score was 14.8%. This showed that non-reassuring fetal heart rate on CTG was not well-related to poor neonatal results. Not any substantial difference in immediate poor neonatal consequences was observed.[4] In another study, the poor Apgar score was 45.2% in cases who underwent emergency cesarean section due to non-reactive CTG. Monitoring by CTG is the non-invasive, economical, hands-on method that shows any variations in the FHR baseline, which can correlate to adverse fetal outcomes. Cesarean section conducted exclusively on data achieved via CTG monitoring would not produce significant advantages for fetal welfare (i.e., poor Apgar score), and the cesarean section rate is increased without advantages for mother and fetus.[5]

The rationale of this study is that a non-reassuring CTG at the time of delivery is linked with meconium-stained liquor, the need for prompt obstetric intervention for an optimal fetal status, low birth weight, and poor Apgar score after emergency cesarean section. It has been noticed that often prediction of CTG is found to be negative, as evident from one study which showed that in females who underwent emergency cesarean section due to non-reactive CTG, few neonates had poor Apgar scores. However, another study reported that the incidence of poor Apgar score was higher in females who underwent emergency cesarean section due to non-reactive CTG. Moreover, previous studies were conducted on small sample size, so we cannot rely on contradictory results. So, we conducted this study on a large sample size to achieve more précised results. This may help us, in the future, to plan better diagnostic methods for better fetal surveillance and optimal pregnancy outcome. The objective of the study was to analyze the fetal outcome after emergency cesarean section due to non-reactive cardiotocography in females presenting at term for delivery.

Operational Definitions

Emergency cesarean section: It was measured as if the female required delivery through an abdominal incision due to non-reactive CTG. Non-reactive CTG was labeled as follows:

1. Fetal initial heart rate (FHR) <100 or> 180 beats / min
2. Variability <5 ≥ 90 min
3. Atypical variable deceleration, late deceleration, single long delay> 5 min.
4. Lack of acceleration

The fetal outcome was measured in terms of:

Poor Apgar score: It was labeled if the Apgar score is less than 7 after 5 minutes of birth (Annexure-II)

MATERIAL AND METHODS

This descriptive cross sectional study was conducted department of Obstetrics and Gynaecology, Jinnah Hospital, Lahore.

The study was carried out over six months, from 23-07-2015 to 22-01-2016.

A sample size of 200 events was calculated in women undergoing emergency cesarean section due to non-reactive CTG, taking a 95% confidence interval, 5% error margin, and an expected weak Apgar score percentage of 14.8%.[4]

Non-probability, consecutive sampling was used.

Women between the ages of 18 and 40 who underwent emergency cesarean section due to non-reactive CTG (according to the definition of surgery).

Multiple pregnancies (on USG), abnormal presentation like macrosomia, non-cephalic presentation, or IUGR (on USG), women with PIH (BP> 140/90 mmHg), preeclampsia

(BP> 140/90, protein urea +1 rod method) and / or eclampsia (preeclampsia with convulsions), gestational diabetes (BSB> 186 mg / dl), cesarean delivery for other primary indications premature rupture of membranes [(PROM), placental abruption or placenta praevia or accreta, on clinical and USG examination] were excluded from the study.

Data Collection Procedure:

Following the approval of the hospital's ethics committee, 200 women who matched the selection criteria were retained in the labor room of the Lahore Jinnah Hospital, Obstetrics and Gynecology Department. Informed consent was obtained. Demographic data (name, age, gestational age, parity, and contact) were obtained. The women underwent emergency cesarean section under spinal anesthesia by a single surgical team. After birth, the Apgar score is estimated at 5 minutes. If, after 5 minutes, the score is <7, then the weak Apgar score is labeled (according to the operation definition). All this information was collected through a pre-prepared Proforma.

Data Analysis Procedure

The data were analyzed with SPSS 20 version. Quantitative variables such as age, gestational age, and Apgar score were calculated as mean and standard deviations. Qualitative variables such as parity and weak Apgar scores were calculated as frequency and percentage. The frequency is calculated for parity. Data are stratified for women's age and parity (nullipara/multipara). Chi-square test was used to compare the variables. p-value ≤0.05 was taken as significant.

RESULTS

A total of 200 patients were included in this study during the study period of six months, from 23-07-2015 to 22-01-2016.

Regarding age distribution, 105 patients (52.5%) were between 18-30 years of age, and 95 patients (47.5%) were between 31-40 years old (Table-1).

The majority of the patients, 161 (80.5%), had had gestational age between 37-40 weeks, and the remaining 39 (19.5%) patients' gestational age was 41-42 weeks (Table-2). According to parity distribution, 106 (53.0%) were nulliparous while 94 (47.0%) were multiparous (Table-3).

A poor Apgar score was observed in 31 patients (15.5%) and a good Apgar score was seen in 169 patients (84.5%) (Table-4).

The mean age of the patients was 30.03±7.64 years, the mean gestational age was 38.75±1.65 weeks, and the mean Apgar score was 7.56±1.41 (Table-5). Stratification about age and parity was carried out and presented in Tables 6 and 7.

Table-1: Distribution of patients by age

Age (Year)	Number	Percentage
18-30	105	52.5
31-40	95	47.5
Total	200	100.0

Table-2: Distribution of patients by gestational age

Gestational age (week)	Number	Percentage
37-40	161	80.5
41-42	39	19.5
Total	200	100.0

Table-3: Distribution of patients by parity

Parity	Number	Percentage
Nulliparous	106	53.0
Multiparous	94	47.0
Total	200	100.0

Table-4: Distribution of patients by Apgar Score

Apgar Score	Number	Percentage
Poor	31	15.5
Good	169	84.5
Total	200	100.0

Table-5: Mean values of age, gestational age and Apgar score

Variables	Mean	S.D
Age (Year)	30.03	7.64
Gestational age (week)	38.75	1.65
Apgar score	7.56	1.41

Table-6: Stratification regarding age

Age	Poor Apgar score		Total	p-value
	Poor	Good		
18-30	15	90	105	0.618
31-40	16	79	95	
Total	31	169	200	

Table-7: Stratification regarding parity

Parity	Poor Apgar score		Total	p-value
	Poor	Good		
Nulliparous	18	88	106	0.539
Multiparous	13	81	94	
Total	31	169	200	

DISCUSSION

The aim of electronic fetal heart monitoring by cardiotocography was to identify fetuses affected by hypoxia during labor in a better way. Long-term neonatal outcomes did not show any benefit, and cesarean section rates increased by four folds.[6-8]

It shows that CTG understanding is sometimes erroneous, fails to predict early neonatal outcomes, is not consistent, and can be influenced by medicolegal claims. There was an increased incidence (15.5%) of the poor Apgar score (< 7) at term due to non-reactive cardiotocography in the current study, which was close to another study by Roy et al.[4]

In the current study, the Caesarean section rate was higher in primigravidas (53.0%) than in multigravidas (47.0%). These results are consistent with a study carried out by Naheed et al.[1]

Several questions have been raised regarding general anesthesia and induction-delivery interval because of their association with fetal acidosis and sedation. The patient was previously draped prior to the induction of anesthesia to keep the induction-delivery interval short, but it was horrifying for the patient. Nowadays, patient preparation and draping are performed after anesthesia induction at most western centers and tertiary care hospitals in Pakistan.[9]

CTG alone is not reliable for examining births by cesarean section, although it has emerged worldwide as a modern and non-invasive fetal monitoring method.[10] Other methods of detecting fetal distress may help reduce this trend, but CTG monitoring significantly increases the birth rate by cesarean section alone.[2]

Compression of the fetal head during a contraction causes early decelerations during the late first or second stage of labor. Generally, these decelerations are caused by mild transient hypoxia and are not associated with a poor fetal outcome. However, CTG must be observed for any variation in the deceleration pattern, followed by further tests of fetal wellbeing. No substantial difference was observed in five-minute Apgar scores, amongst two groups of fetuses with and without early decelerations, in two cohorts[11]

Late Decelerations are seen after the peak of uterine contractions, reaching the baseline at least 20 seconds after the contraction disappears. It derives its name "late" due to its delayed recovery to the baseline rate. An important cause is a uteroplacental insufficiency which is mostly associated with significant hypoxia.[11, 12]

Variable decelerations are due to umbilical cord compression. The conditions causing cord entanglement are the Umbilical cord around the neck, true knot in the umbilical cord, and prolapsed umbilical cord. Oligohydramnios may also cause repeated variable decelerations.

A study examined variable decelerations in fetal outcomes. Simple or typical variable decelerations were not always shown to be correlated with poor neonatal outcomes. Atypical or complicated variable decelerations were correlated with poor or adverse neonatal outcomes.[12,13]

Various research trials carried out at the Polizu Obstetrics and Gynecology Clinic in 2007 on the significance of CTG monitoring for identifying acute fetal distress established that there were various false-positive outcomes. CTG depicted fetal distress, and newborns scored an Apgar of 8–10, which resulted in an unnecessary cesarean section.[14,15] The results of our study are similar to these studies, as we also found that

CTG changes caused many cases of fetal distress, but the neonatal Apgar score was between 8 and 10. This suggests that the verdict to perform a cesarean section is centered solely on CTG changes (indicative of fetal distress), leading to an increase in the rate of a cesarean section without significant improvement in patient and neonatal outcomes.

CONCLUSION

Fetal distress (antepartum and peripartum) is a very important problem that cannot be ignored. This can lead to a rise in neonatal disease and death if not detected in time. Fetal heart rate monitoring with CTG is a simple, non-invasive, easy, and inexpensive method that detects changes in FHR. This research demonstrates that a cesarean section based only on data gained through CTG monitoring is not advantageous for the fetus's health. It is often a false positive and unreasonably raises the cesarean section rate with no benefit to the mother and fetus. Thus, other methods for assessing fetal wellbeing should be included before the decision to give birth by cesarean section, rather than relying solely on CTG.

AUTHOR'S CONTRIBUTION

AA: Data collection
SKK: Conception and planning
UA: Data collection
AZ: Literature review
SS: Interpretation of results
FN: Supervision

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