

Outcomes of Pregnant Females Presented with Non-Reactive CTG

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ABSTRACT

Objective: One of the objectives of this research was to determine the rate outcomes for patients who first presented with non-reactive cardiotocography.

Study Design: Descriptive study

Place and Duration: Sindh Government Qatar Hospital Orangi town Karachi. Jan 2022-Dec 2022

Methods: 133 women between the ages of 20 and 42 who presented to the OPD or ER with labor pains were included in the research. Abnormalities were seen on both the antepartum and intrapartum CTG. The manner of delivery was decided after a CTG and physical assessment. SPSS 24.0 was used to analyze and input the data. As a follow-up to the stratification process, Chi-square was employed. Values of p less than 0.05 were considered significant.

Results: Mean age of the females was 27.14±12.88 years and had mean BMI 36.2±5.81 kg/m². Mean gestational age of the females was 37.2±3.34 weeks. There were 80 (60.2%) cases had rural residency. Frequency of obesity and anemia was 13 (9.8%) and 18 (13.5%). We found C-section in 58 (43.6%) cases, induction of labor in 42 (31.6%) cases and prolong labor in 33 (24.8%) cases. Frequency of pre-eclampsia found in 46 (34.6%) cases, gestational diabetes in 55 (41.4%) cases and post-partum haemorrhage in 77 (57.9%) cases. Low apgar score found in 25 (18.8%) cases.

Conclusion: Cardiotocography monitoring in labor is associated with a higher risk of caesarean sections because of its high false positive rate. Our research shows that pregnant women who are overweight have an increased risk of developing diabetes, premature labor, and preeclampsia and these are contributing factors for non-assuring CTG.

Keywords: Non-reactive cardiotocography, C-section, Obesity, Anemia, PPH

INTRODUCTION

A significant part of prenatal care is monitoring the fetal heart rate. The goal of prenatal screening during labor is to identify fetuses at risk of hypoxia during delivery and to take appropriate action to protect the fetus if necessary [1-3]. It was difficult to know the health of an unborn child before the development of the Pinard stethoscope. There was nothing further that could be done save counting on the uterus maturing and the mother picking up on fetal movement. Other methods of determining the health of the fetus during delivery included amniotic fluid analysis and the auscultation of fetal heart sounds. A similar belief was held that meconium-stained liquor (MSL) was always an indication of fetal discomfort.

Cardiotocography, also known as intrapartum electronic fetal monitoring (EFM), has emerged as a useful method for monitoring the health of the fetus in the womb and throughout labor and delivery [4]. It detects how uterine contractions affect the fetal heart rate [3]. CTG can tell you how your unborn child is doing. The number of fetal deaths that occur during labor and delivery has decreased dramatically as its use has increased over the past two decades [2]. There has been a 60% decrease in newborn fatalities attributed to hypoxia since the advent of contemporary EFM technology [2]. A normal trace indicates a fetus that is receiving adequate oxygen, while an aberrant trace indicates a fetus that is in distress [2]. It's crucial to remember that CTG recording is no replacement for clinical skill or an excuse to leave the patient unattended throughout labor and delivery. The use of cesarean sections and other forms of artificial delivery has increased during the past four decades [5]. CTG plays a significant role in the increasing number of successful births. But research has shown that false-positive CTG traces have led to needless operative delivery [6]. There is a 60% positive predictive value for fetal distress with CTG [6]. CTG or EFM is preferred over intermittent auscultation [7], and it has contributed to the growth in operative births. CTG, however, is a subjective test, therefore it should not be depended on alone to prevent needless treatments, as stated by Beard et al. [8].

Cardiotocography can identify IUGR (Intrauterine growth restriction), which increases the risk of fetal distress. An ultrasound

transducer is used to capture the fetal heart rate during a cardiotocography examination, while a tocogram is used to monitor uterine contractions [6]. Fetal heart rate monitoring is very sensitive and may identify a variety of fetal abnormalities, including metabolic (95.5%), mixed (95%) and respiratory (100%) abnormalities. The caesarean section rate [7] may rise if pathologic findings from cardiotocography are found during childbirth. Global estimates place the percentage at 15%, with substantial variation across low-income and high-income countries: from 3.5% in Africa to 33% in the United States to 43.9% in Brazil [9]. Studies [8, 10] report a range from 9.6% to 19% of cesarean sections performed owing to fetal distress detected by cardiotocography.

Guidelines from the National Institute for Health and Care Excellence (NICE) classify CTG patterns as either normal (reassuring), suspicious (non-reassuring), or pathological (abnormal). The pattern will be suspicious if any one of the four characteristics is off, and the trace will be pathological if two or more features are off. A high cord nucleated red blood cell count, a predictor of a poor fetal outcome, has been linked in many studies to aberrant CTG [11]. It is crucial to correctly evaluate CTG and identify a fetus whose abnormal CTG during labor indicates probable hypoxia and birth asphyxia. Fetal testing and monitoring prior to and during labor are important tools for spotting signs of fetal distress. Preventing birth asphyxia may be possible with prompt and appropriate action based on these observations. CTG has become the gold standard for non-invasive fetal monitoring because it is safe, effective, and its results can be written down and verified. The Apgar score, the presence of acidosis, hypoxic-ischemic encephalopathy, and the following neuromotor development of a newborn are all significantly correlated with abnormal CTG [12].

MATERIAL AND METHODS

This descriptive study was conducted at Sindh Government Qatar Hospital Orangi town Karachi and comprised of 133 pregnant females. Individuals who did not give informed permission were also excluded, as were those who had a history of clotting problems, chronic renal failure, abnormal liver function tests (LFT), or hypothyroidism (as documented in the patient's medical record).

It also did not include fetal congenital abnormalities like heart defects.

Patients were included if they were between the ages of 20 and 42, had a gestational age of more than 37 weeks and up to 40 weeks, were not hypertensive, and had non-reactive cardiotocography. The history of the participant's uterine contractions was thoroughly questioned, including how often they occurred and when they first started. In every case, ultrasounds performed in our hospital's radiology department confirmed the expected gestational age. Pathological results were determined when antepartum and intrapartum CTG were done. Each patient underwent a left lateral position CTG for 20-30 minutes, and the results were reported in accordance with the operational definition. The consultant or researcher herself decided on the best delivery strategy based on the results of the physical exam and CTG, and patients were treated appropriately. Patient demographics (name and age), gestational age (in weeks), APGAR score (normal/low), body mass index (BMI), obesity, residential status (urban/rural), and family income were input into a pre-designed proforma.

SPSS v25.0 for the social sciences was used for all statistical analyses and data entry. We determined the rates of obesity, anemia, household income, country of origin, and caesarean section birth. Metrics such as age, gestational age, and body mass index were utilized to compute central tendencies and dispersion. Age, gestational age, obesity, anemia, family income, and place of residence were all potential confounding variables that were taken into account by stratification to reduce their impact on the outcome. A Chi-square test was run once the information was divided into strata. The p-value must be lower than 0.05 for the result to be significant.

RESULTS

Mean age of the females was 27.14±12.88 years and had mean BMI 36.2±5.81 kg/m². Mean gestational age of the females was 37.2±3.34 weeks. There were 80 (60.2%) cases had rural residency. Majority of the females 89 (66.9%) were illiterate. Frequency of obesity and anemia was 13 (9.8%) and 18 (13.5%).(table 1)

Table-1: Demographics of the enrolled cases

Variables	Frequency	Percentage
Mean age (years)	27.14±12.88	
Mean BMI (kg/m ²)	36.2±5.81	
Mean gestation age (weeks)	37.2±3.34	
Place of living		
Rural	80	60.2
Urban	53	39.8
Education status		
Yes	89	66.9
No	44	33.1
Obesity		
Yes	13	9.8
No	120	90.2
Anemia		
Yes	18	13.5
No	115	86.5

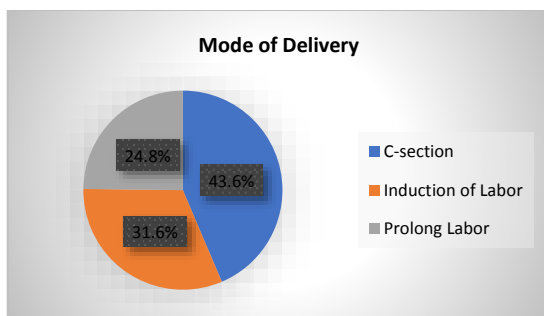


Figure-1: Mode of delivery among all cases

We found C-section in 58 (43.6%) cases, induction of labor in 42 (31.6%) cases and prolong labor in 33 (24.8%) cases.(figure 1)

Frequency of pre-eclampsia found in 46 (34.6%) cases, gestational diabetes in 55 (41.4%) cases and post-partum haemorrhage in 77 (57.9%) cases. Low apgar score found in 25 (18.8%) cases. (table 2)

Table-2: Outcomes of pregnant females

Variables	Frequency	Percentage
Outcomes		
pre-eclampsia	46	34.6
gestational diabetes	55	41.4
post-partum haemorrhage	77	57.9
Low apgar score		
Yes	25	18.8
No	108	81.2

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.[13] 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 (18.8%) of the poor Apgar score (< 7) at term due to nonreactive cardiotocography in the current study, which was close to another study by Roy et al.[14]

In current study 133 pregnant females were included. Mean age of the females was 27.14±12.88 years and had mean BMI 36.2±5.81 kg/m². Mean gestational age of the females was 37.2±3.34 weeks. There were 80 (60.2%) cases had rural residency. Results of our study was comparable to the studies conducted in past.[15,16] Predicting fetal discomfort with cardiotocography in low and high risk pregnancies. Several options exist for dealing with "high risk" women, but there has to be a better way to identify "fetal distress" in "low risk" women [17]. Cardiotocography is still widely used for intrapartum evaluation and labor control, despite its known drawbacks. When cardiotocography and the amniotic fluid index are used together (AFI). After a reactive cardiotocography, the perinatal death rate is 3-5/1000 in the first week [17]. Nonreactive Cardiotocography is likely to yield the same results, while reactive Cardiotocography may improve fetal prognosis. Yet, just though fetal heart rate irregularities are common during labor does not mean that the health of the fetus is in danger. In our study, pre-eclampsia found in 46 (34.6%) cases, gestational diabetes in 55 (41.4%) cases and post-partum haemorrhage in 77 (57.9%) cases. Low apgar score found in 25 (18.8%) cases.

In current study, obesity and anemia was 13 (9.8%) and 18 (13.5%). We found C-section in 58 (43.6%) cases, induction of labor in 42 (31.6%) cases and prolong labor in 33 (24.8%) cases. Findings were inline with the some previous studies.[18,19] Concerns have been expressed about the link between general anesthetic and fetal acidity and sedation, as well as the induction-delivery gap. Draping the patient before administering anesthetic helps reduce the time between the two procedures, but it must have been terrifying for the patient. Most modern western institutions and tertiary care hospitals in Pakistan practice patient preparation and draping after inducing anesthesia. [20] Although CTG has evolved globally as a contemporary and noninvasive fetal monitoring tool, it is not accurate when used alone for analyzing cesarean section deliveries. [21] CTG monitoring dramatically raises the birth rate via cesarean section, however other ways of identifying fetal distress may help mitigate this tendency. Late in the first or second stage of labor, early decelerations can occur when the fetal head is compressed during a contraction. Mild, temporary hypoxia is the most common cause of these slowdowns, and it is not linked to a negative fetal outcome. Nevertheless, if

there is a change in the deceleration pattern on the CTG, additional testing of the fetus's health is warranted. Five-minute Apgar scores did not significantly differ between fetuses in two cohorts, one with and one without early decelerations. Uterine contractions have late decelerations following their peaks, returning to baseline at least 20 seconds after they cease. It gets its "late" moniker because it takes longer than average to return to its original speed. Uteroplacental insufficiency, which is typically linked to severe hypoxia, is a major contributor. [22,23]

Increases in both the rate of Cesarean sections and the total number of obstetric procedures have been linked to the widespread use of cardiotocography. If cardiotocography results are abnormal, it is common practice to do a cesarean section to facilitate birth. A 72 percent C-section rate was found in a research by Oladrian et al. [24]. The percentage of surgical births for fetal distress increased from 5.17 percent in the reactive group to 28.5 percent in the foreboding group, according to a research by Kulkarni and Shrotri [25]. A high prevalence of C-sections has been linked to cardiotocographic abnormalities [26] in other research. When cardiotocography was used for low-risk pregnancies, an increase in the rate of cesarean deliveries was seen. According to the guidelines for cardiotocography monitoring put forward by the National Institute for Clinical Excellence (NICE) [27], the practice is advised on an as-needed basis for low-risk delivery but should be employed continuously for high-risk labor.

CONCLUSION

Cardiotocography monitoring in labor is associated with a higher risk of caesarean sections because of its high false positive rate. Our research shows that pregnant women who are overweight have an increased risk of developing diabetes, premature labor, and preeclampsia and these are contributing factors for non-assuring CTG.

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