ORIGINAL ARTICLE

Frequency of Cesarean Section in Patients Presenting with Non-Reactive Cardiotocography (CTG)

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ABSTRACT

Objective: Aim To determine frequency of cesarean section in patients presenting with non-reactive cardiotocography.
Study Design: Descriptive study
Place and Duration: Obstetrics and Gynaecology Unit-II at Peoples University Hospital Nawabshah. Feb 2021-August 2021
Methods: This study included 156 women had age 20-45 years admitted to the labour room through OPD and ER with uterine contractions. Antepartum and intrapartum CTG revealed abnormal results. Physical examination and CTG determined delivery mode. SPSS v25.0 examined and entered data. Chi-square was used post-stratification. Significant p-values were <0.05.
Results: There were 82(52.6%) patients were in 18-30 years age group and 74(47.4%) were in 31-40 years age group. According to gestational age distribution, 86(55.1%) were from 37-38 weeks gestational age group and 70(44.9%) from 39-40 weeks gestational age group. Majority of the patients 97(62.2%) had rural residence and 59(37.8%) from urban area. Among all 11(7.1%) were obese and 19 (12.2%) had anemia. We found that 58(37.2%) cases had low income, while 42(26.9%) and 56(35.9%) had middle income and high income respectively. Frequency of C-section was found in 72(46.2%).
Conclusion: Due to the high false positive rate of cardiotocography monitoring in labor, women are more likely to have a caesarean section. Other tests, such as fetal scalp electode and fetal pH, should be done to diagnose fetal distress before having one.
Keywords: C-section, Non-reactive cardiotocography, Anemia, Obesity

INTRODUCTION

The use of cardiotocography, which measures both foetal heart rate and contractions, has greatly improved both prenatal and postnatal diagnosis. Foetal hypoxia causes a slowing of the FHB, and Hon was the first to show this phenomenon. Nowadays, almost all pregnant women get cardiotocographic monitoring, which likely results in a significant rise in the rate at which Caesarean sections are performed due to complications with the foetus. Preventing stillbirth, hypoxia, and brain injury in the newborn is a primary concern in obstetrics, and so is ensuring a safe delivery. More than 75% of intrapartum stillbirths in the United Kingdom (UK)[2] had evidence of suboptimal treatment, meaning that alternate management "may, or would reasonably have been expected to have made a difference to the result." [3] Cardiotocography is the most widely used non-invasive prenatal monitoring method and provides verifiable evidence of the health of the foetus in the uterus, therefore it has several advantages. There is a substantial correlation between an irregular CTG and a low Apgar score in a newborn. [4]In the United Kingdom, the United States, and many other industrialised nations, measuring the foetal heart rate (FHR) during pregnancy is standard practise. Although its use has been connected to lower rates of unexpected intrapartum foetal mortality and early-onset neonatal convulsions, it has also been associated with greater expenses and an increase in the frequency with which non-acidotic infants are delivered via surgery. If you want to have a healthy, happy baby with as little fuss as possible during birth, it's important to keep an eye on the foetus during labour. Although many foetuses in a pregnancy have a good chance of surviving the birthing process, the terrors of the delivery canal can cause a "stress reaction" in the developing infant.[5,6]

An unborn child with utero-placental deficiency may suffer from acute or subacute hypoxia during labour. It is possible that some foetuses will already be hypoxic when labour begins. Fetal monitoring throughout labour identifies foetuses at risk of hypoxic injury, enabling the appropriate intervention to be put in place to enhance perinatal outcome. [7-8] For women who had a normal CTG, the rate of caesareans was 13.4 percent and the rate of

vaginal births was 83.3 percent; these were considered positive maternal outcomes. The percentage of vaginal births was 23.3%, the rate of aided vaginal births was 10%, and the rate for caesarean sections was 66.7% for women with abnormal CTG. Women whose labours were monitored with both foetal scalp blood collection and cardiotocography had a lower caesarean rate than women whose labours were monitored with cardiotocography alone, without compromising the foetal outcome, according to a 2009 study [9]. According to the results of one study [10], 144 women exhibited a reactive pattern of CTG, while 66 women did not. Of the control group, 72.72 percent delivered through caesarean section. The purpose of antenatal foetal surveillance is to detect, intervene in, and prevent pregnancies afflicted by foetal hypoxia that may lead to foetal and neonatal illness and mortality.[11]

A rise in C-section rates has been linked to the use of CTG as a standalone indicator of foetal distress; however, it is unclear if this practice, which places a heavy load on already overworked medical professionals and patients in our resource-constrained nation, is indeed beneficial. Given the lack of available information, it is imperative that we conduct research on our population. The results of my study will shed light on the true size of our local populace, allowing the government to more accurately allocate resources. It will be helpful for other medical professionals to evaluate and identify patients or deliveries that are at high risk. This gives the locals a strong argument in favour of the study being conducted here.

MATERIAL AND METHODS

This descriptive study was conducted at Obstetrics and Gynaecology Unit-II at Peoples University Hospital Nawabshah and comprised of 156 pregnant females. Patients with a history of medical disorders such as clotting disorder, chronic renal failure, deranged LFT, hypothyroidism (as per medical record), and patients who do not give consent of participation were excluded. Fetal congenital malformations, such as congenital heart disease, were also excluded.

Included patients were aged between 20-45 years, Irrespective of parity or gravida, Gestational age more than 37 weeks pregnant till 40 weeks and non-reactive cardiotocography. The participant's detailed history was elicited regarding frequency and time of onset of uterine contractions. Gestational age was checked in every case by the ultrasound done in radiology department of our institute. CTG was performed in antepartum and intrapartum period and pathological findings were identified. CTG was performed in every patient for 20 to 30 minutes in the left lateral position and the readings were recorded according to the operational definition. Based on the findings of physical examination and CTG, the appropriate method of delivery was decided by the consultant or by the researcher herself, and the patients were managed accordingly. All the findings were entered in a pre-designed proforma which included patient's demographics (name and age), gestational age (in weeks), APGAR score (normal/low), BMI, Obesity, Residential status either urban or rural area, family income, as per operational definitions.

Statistical analysis and data entry were performed using SPSS v25.0 for the social sciences. Obesity, anaemia, family income, place of residence, and c-section all had their frequency of occurrences and percentages calculated. Quantitative factors including as age, gestational age, and body mass index were used to determine means and standard deviations. Using stratification, we were able to minimize the influence of confounding factors such age, gestational age, obesity, anemia, family income, and place of residency on the observed outcome. After the data was stratified, a Chi-square analysis was performed. To be considered significant, the p-value has to be less than 0.05.

RESULTS

There were 82(52.6%) patients were in 18-30 years age group and 74(47.4%) were in 31-40 years age group. According to gestational age distribution, 86(55.1%) were from 37-38 weeks gestational age group and 70(44.9%) from 39-40 weeks gestational age group. Majority of the patients 97(62.2%) had rural residence and 59(37.8%) from urban area.(table 1)

Table-1: Demographics of the enrolled cases

Variables	Frequency	Percentage
Age		
18-30 (years)	82	52.6
31-45 (years)	74	47.4
Gestational age		
37-38 (weeks)	86	55.1
39-40 (weeks)	70	44.9
Residency		
Rural	97	62.2
Urban	59	37.8

We found that 58(37.2%) cases had low income, while 42(26.9%) and 56(35.9%) had middle income and high income respectively.(figure 1)
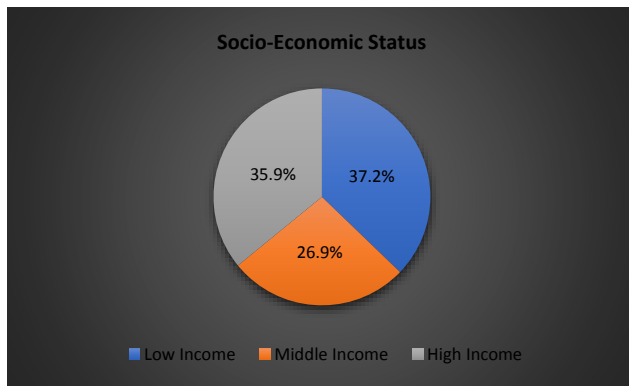

Figure-1: Socio-economic status of all cases

Among all 11(7.1%) were obese and 19 (12.2%) had anemia. (table 2)

Table-2: Frequency of obesity and anemia among all cases

Variables	Frequency	Percentage
Obese		
Yes	11	7.1
No	145	92.9
Anemia		
Yes	19	12.2
No	137	87.8

Frequency of C-section was found in 72(46.2%) and vaginal deliveries were found in 84 (53.8%) cases.(figure 2)
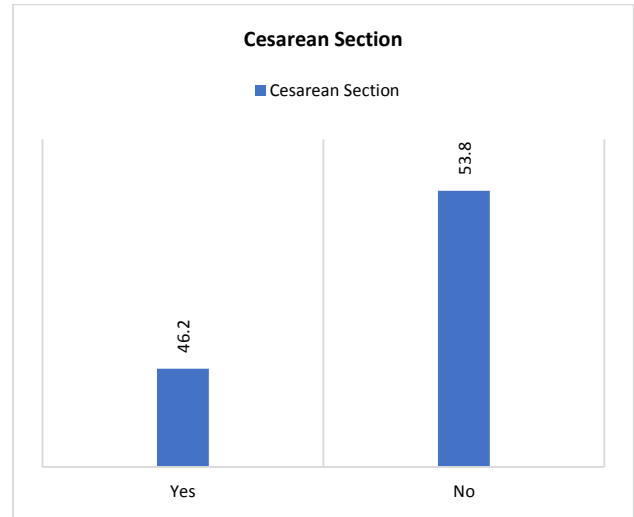

Figure-2: Association of C-section among all cases

According to socio-economic status, 21 cases had low socio-economic, 27 cases had high and 24 cases had high socioeconomic status among 72 cases of c-section.(table 3)

Table-3: Frequency of c-section with respect to socio-economic status

Socio-economic status	Cesarean section		Total	p-value
	Yes	No		
Low (<20,000/month)	21	37	58	0.017
	36.2%	63.8%	100.0%	
Middle (20-50,000/month)	27	15	42	
	64.3%	35.7%	100.0%	
High (>50,000/month)	24	32	56	
	42.9%	57.1%	100.0%	
Total	72	84	156	
	46.2%	53.8%	100.0%	

DISCUSSION

During a CTG, a transducer is put on the mother's belly to continuously monitor the foetal heartbeat. Fetal well-being monitoring during labour is performed so that any necessary interventions can be made to guarantee a positive short- and long-term perinatal outcome. It has been shown that non-high-risk women who have continuous electronic foetal monitoring are more likely to undergo invasive procedures without any benefit to the baby or mother. Low-risk pregnancies may benefit from intermittent auscultation. [13] Ayromlooi J, Garfunkel R found that use FSB pH sampling decreased the rate of caesarean section from 78.0% to 57.5% without significantly impacting the Apgar score. Despite the unsettling foetal heart rate trace, a study by Reif and colleagues found that surgical birth could be avoided in 6.4% of the study population, demonstrating that foetal blood analysis is a useful tool for reducing the number of operative deliveries. After conducting initial pH analyses with FBS, [15] Holzmann M et al. conducted a

secondary analysis on a sizable population. Only 6.8% of births where pH was measured did not have severe acidemia. [16]Kavitha et al. concluded from their study that further strategies are needed to improve the usefulness of foetal monitoring in order to reduce the likelihood of inappropriate intervention. [17]In a different locally conducted trial, CTG was employed to keep tabs on labouring patients in the hospital. In the previous trial, 27% of patients with non-reactive CTG had successful deliveries, but this did not happen in ours. This investigation confirmed our findings that non-reactive CTG was linked to a low Apgar score and an aberrant foetal scalp pH.Both methods of foetal monitoring are more successful when used jointly, as was suggested by this study and further supported by its findings.[18]

In 2012, researchers looked at the correlation between admission cardiotocogram (CTG) results and foetal outcome in patients with risk factors to determine the usefulness of admission CTG in detecting foetal hypoxia during labour. Patients who had CTG results that were not encouraging had a higher rate of negative perinatal outcomes. [9] Labor hypoxia can be either severe or sub-acute in a foetus with utero-placental insufficiency. It's possible that some unborn babies are hypoxic before labour begins. Fetal monitoring during labour identifies foetuses who are at risk of hypoxia damage so that appropriate intervention can be implemented to improve postnatal outcome. [7-8] Women with normal CTG had a caesarean section rate of only 13.4% and a vaginal delivery rate of 83.3%, while those with faulty CTG had rates of only 23.3% vaginal deliveries, 10% assisted vaginal births, and 66.7% caesarean sections. Those who undergo foetal scalp blood sampling and cardiotocography monitoring during labour had a lower rate of caesarean delivery without compromising foetal outcome compared to women who have cardiotocography monitoring alone [9]. [10] CTG showed a reactive pattern in 144 women and a non-reactive pattern in 66 women. C-section rates were higher (72.72%) in the non-reactive group. [11]

CONCLUSION
Due to the high false positive rate of cardiotocography monitoring in labor, women are more likely to have a caesarean section. Other tests, such as fetal scalp electode and fetal pH, should be done to diagnose fetal distress before having one.

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