International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Singhal M et al. Int J Reprod Contracept Obstet Gynecol. 2023 Apr;12(4):874-882
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20230684

Original Research Article

A study on cardiotocography for predicting fetal prognosis in high-risk pregnancy

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Received: 22 February 2023
Accepted: 10 March 2023

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ABSTRACT

Background: The admission cardiotocography (CTG) in high-risk obstetrics patients for continuous monitoring of fetal heart rate (FHR) has become crucial in the modern obstetric practice. It is not only a good screening and inexpensive test but also non-invasive, easily performed and interpreted.
Methods: This was a prospective observational study conducted in department of obstetrics and gynaecology, Pannadhay Rajkiya Mahila Chikitsalaya at RNT medical college, Udaipur from April 2022 to September 2022. A total of 100 high risk obstetrics patients were subjected to cardiotocography (CTG). The Women eligible for the study were those who had gestational age ≥32 weeks with cephalic presentation in first stage of labour with singleton fetus in vertex presentation and categorised as high-risk during the time of admission.
Results: A total of 100 high risk obstetric patients were subjected to CTG. Out of these common high-risk factors in our study consisted of postdated pregnancy (21%) followed by pre-eclampsia (19%), oligohydramnios (16%) cord around neck (13%). Majority of them (47%) fall under 20-25 years and constituted by primigravida (59%). CTG was reactive in (65%), non-reactive in 25% of cases and 10% patients had suspicious tracings. The incidence of neonatal intensive care unit (NICU) admission, fetal distress and APGAR score less than 7 was significantly higher with suspicious and nonreactive CTG than reactive CTG.
Conclusions: CTG test is a simple, non-invasive screening test should be used in high risk pregnancy as admission test. The heavy load of constant monitoring and adverse perinatal outcome can be reduced by CTG monitoring in high-risk obstetrics patients.

Keywords: CTG, NICU, FHR

INTRODUCTION

The sweetest sound for a mother is cry of her Newborn baby and for the obstetrician it is a fruit of careful maternal and fetal surveillance. Journey of the fetus through the birth canal is a stressful response which can be manifested by the fetus as a "stress response" in the form of fatal heart rate abnormity.[1]

Fetal surveillance during labour is important to ensure delivery of a healthy baby. Cardiotocography (CTG) is a continuous recording of the fetal heart rate (FHR) which is used in early labour to detect such compromise fetus in labour wards. It is obtained via an ultrasound transducer placed on the mother's abdomen. The machine used to perform monitoring is called a "cardiotocograph."

Routine electronic monitoring of FHR become an established practice to identify fetal hypoxia in early stage so that appropriate management can be given timely. Hence CTG plays important role in labour monitoring and identification of fetal distress. CTG has been a durable cornerstone of antenatal testing.[2]

The goal of antepartum fetal surveillance is to prevent fetal death. Each and every fetus has a potential risk of intrapartum hypoxia or birth injury and an optimal outcome can be concluded only at the end of labour.

However, any remote insult due to the process of labour can only be identified on long-term follow up.

There are different techniques available to evaluate the fetus at risk. Ideally it should be immediately available, and test should be repeatable without much inconvenience and expense. CTG is most common used test for antepartum and intrapartum fetal surveillance. Evaluation of labour complicated by MSL (meconium stain liquor) can be easily predicted by abnormal FHR tracing.[3]

Admission CTG is short continuous electronic FHR monitoring for 20 minutes along with simultaneous recording of uterine activity on admission to labour room ward. The intrapartum stress is well tolerated by a normal fetus but a compromised fetus can't sustain hypoxia. Thus, perinatal risk of intrapartum hypoxia and subsequent hypoxic ischaemic encephalopathy is common in high-risk pregnancy. Birth asphyxia during birth process is leading cause of perinatal mortality.[4]

CTG is a good screening test because it is a simple test that can be done by nursing staff, done within 20-40 minutes, having high acceptability by the pregnant mothers, repeated at any time and high validity and so it can be used as a good intra partum screening test.

During auscultation the base line FHR can be measured but the other features of the FHR such as base line variability, acceleration, deceleration is difficult to quantify. Hence a new test is required to pick up the apparently low risk and high risk women whose fetus is compromised on admission or is likely to become compromised in labour. It is not only simple and inexpensive but it is also non-invasive, easily performed and interpreted.

Our study aimed to evaluate the usefulness of CTG as a screening method in management of high-risk pregnancy admitted with early labour and to determine the correlation of CTG findings with neonatal outcome in high-risk obstetric patients.

METHODS

This was a prospective observational study conducted in department of obstetrics and gynaecology, Pannadhay Rajkiya Mahila Chikitsalaya at RNT medical college, Udaipur from April 2022 to September 2022. A total of 100 high risk obstetrics patients were subjected to CTG. This study has been conducted to see correlation between CTG and adverse neonatal outcome in high-risk pregnancy and to establish the efficacy of CTG as a tool for fetal surveillance. Informed consent was obtained from the mother enrolled in study. This study was approved by institutional ethical committee.

The women eligible for the study were those who had gestational age ≥ 32 weeks with cephalic presentation in first stage of labour singleton fetus with vertex presentation and categorised as high-risk during the time of admission (Table 2). Women with multiple gestation, pregnancy before 32 week of gestation, acute hypoxic state as cord prolapse, abruption placentae, abnormal lie, scar tenderness, impending rupture were excluded from study.

After obtaining institutional committee approval and informed consent of patient, detailed clinical history was taken and thorough examination was performed as per proforma. CTG was done for 20,40, 60 and 90-minute CTG recording of FHR and result were evaluated according to RCOG guidelines[5] evaluated as reactive (normal) suspicious (equivocal) and non-reactive (pathological). Admission CTG was done with the CTG machine which run at the speed 3 cm/min of left lateral position.

Patients with a reactive tracing were monitored by intermittent auscultation for one minute, every 30 min in the first stage of labour and in every 5 min in second stage of labour. Patients who had suspicious tracing were placed on continuous CTG monitoring. Patients with non-reactive tracing delivery was consequently hastened by either caesarean section or vaginal delivery depending on the stage of labour.

Statistical analysis

Data were analysed using SPSS software version 21. If $p<0.05$, then results were considered as statistically significant otherwise it was taken as statistically non-significant. Descriptive data were presented as percentage.

Assessment parameters

CTG was performed on high-risk patients and interpretations made based on FHR pattern. The five-component calculated from tracing include baseline FHR, FHR variability, FHR acceleration, deceleration and sinusoidal pattern.

Outcome of fetus was evaluated on the basis of following parameter: NICU admission, fetal survival or death and Apgar score at 1 and 5 minute.

Factors which affect CTG

Maternal: Physical activity, position, body temperature, uterine activity, BP.

Fetoplacental: Umbilical cord compression, uteroplacental inefficiency, chorioamniotis.

Fetal: Movement, fetal behavior state of hypoxemia

Exogenous: Medication and smoking.

Anaesthetic drug (GA and LA), Antiepileptic reduces fetal rate variability and flatter curves. Other causes of reduced FHR variable-corticosteroid (Dexamethasone,

betamethasone) and cocaine abuse, magnesium sulphate beta-mimetics (e.g., fenotorel, salbutamol) used as a tocolysis, leads to an increase FHR with simultaneous reduction of variability and acceleration. Such CTG pattern are usually reversible after 5 days.

Antihypertensive such a betablockers (dependent on dose) can result in complete blockage of fetal sympathetic nervous system, causes flattering of acceleration with pronounced bradycardia or even tachycardia. Acoustic factors (stimuli) also affect FHR patterns.

RESULTS

A total of 100 high risk obstetric patients were subjected to CTG. Out of these common high-risk factors in our study consisted of postdated pregnancy (21%) followed by pre-eclampsia (19%), oligohydramnios (16%) cord around neck (13%) premature rupture of membrane (10%), Rh negative (9%,), diabetes cases (5%), IUGR (4%) and anemia (3%) (Table 2). Majority of them (47%) fall under 20-25 yrs. 42% cases were from the age group of 26-30 year. Only 11% cases were from 31-40 years age group. Majority of cases (71%) were >37 week of gestational age while 17% were 34-37 weeks and 12% were in 32-34 week of gestational group. Maximum (59%) were constituted by the primigravida, followed by P1 (28%), P2 were (10%) and only 3% were belonged to multipara (>P2) (Table 3).

Majority of the patient had reactive CTG (65%), non-reactive in 25% of cases and 10% patients had suspicious tracings (Figure 1). Out of 65 cases of reactive tracings, 34 delivered by vaginal delivery and 31 delivered by caesarean section. In 25 non-reactive tracings, 5 cases delivered by vaginal route and 20 cases delivered by LSCS due to fetal distress. 10 cases of suspicious pattern, 4 delivered by vaginal delivery and 6 cases were delivered by LSCS (Figure 2). In our study we observed that highest number of cases (21 cases) were from postdatism, 11 cases were reactive and 7 were non-reactive and 3 were suspicious. Second highest number (19 cases) were constituted by pre-eclampsia, 10 cases were reactive, 6 were non-reactive and 3 were suspicious (Table 4).

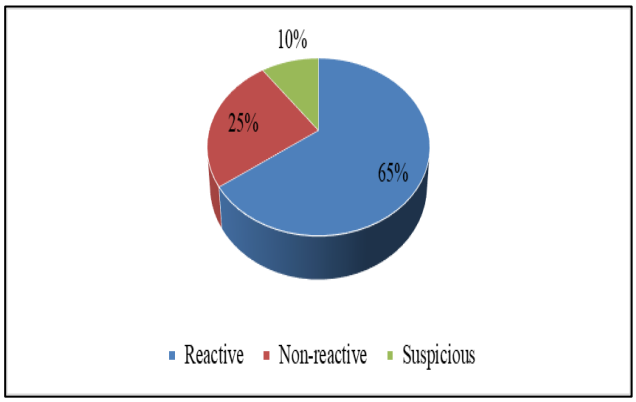

Figure 1: Distribution of cases according to CTG tracing pattern.

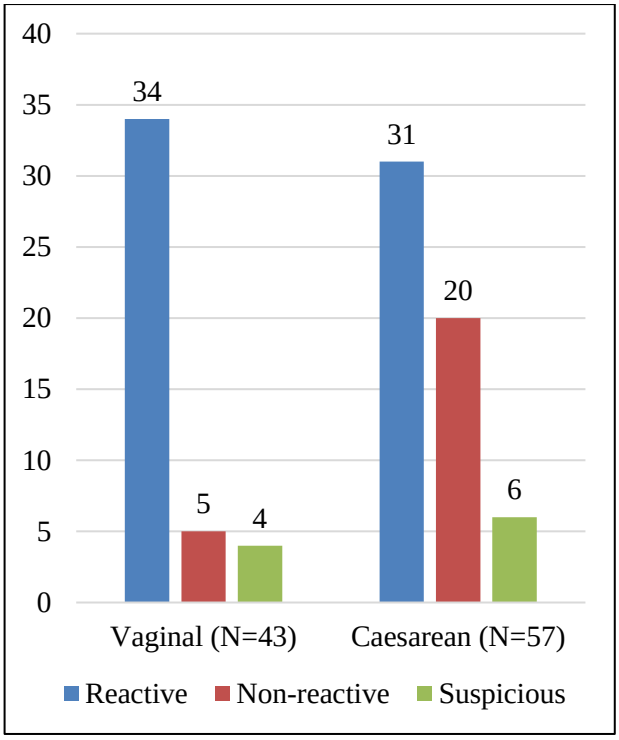

Figure 2: Mode of delivery according to CTG patterns.

APGAR score at 1 minute

Out of 60 patients of reactive CTG, 4 patients (6.2%) developed moderate asphyxia and one case had Apgar score 0-4 at 1 minute. Among 25 patients of non-reactive tracings, 8 patients (32%) developed moderate asphyxia and 1 patient (4%) developed severe asphyxia. In 10 cases of suspicious tracings, 6 patients (60%) developed no asphyxia, 3 patients (30%) developed moderate asphyxia and 1 patient (10%) developed severe asphyxia. There is statistically significant relationship ($p<0.05$) between the CTG findings as well as the Apgar score at 1 minute (Table 5).

APGAR score at 5 minutes

Out of 25 cases of non-reactive tracings, 20 patients (80%) had Apgar score > 7 and 3 patients (12%) had Apgar score 4-6 and only one case had 0-4 Apgar score. In those with 10 suspicious tracings, 9 patients (90%) developed no asphyxia, and only 1 patient (10%) developed severe asphyxia. There is non-significant relationship ($p<0.05$) between CTG findings and APGAR score at 5 minutes. Majority of patients (93.8%) of reactive category developed no asphyxia. There was one case of severe asphyxia in reactive category which was declared still birth due to sepsis and thick meconium (Table 6).

Incidence of the fetal distress was higher in the non-reactive (56%) as well as the suspicious CTG (70%) (Table 7). Reactive CTG required less NICU admission as compared to non-reactive and suspicious CTG (29.6%,

58.3% as well as 66.6% respectively) (Table 8). Majority of the caesarean delivered newborn in the suspicious (83.3%) as well as the pathological (60%) category were got admitted to the NICU as compared to the lower admission in vaginal delivered reactive cases (24.2%) (Table 9).

There were 3 stillbirths in the study group, one in each category (Figure 3).

Prediction of fetal distress has a sensitivity of 50 percentages, specificity of 75.9 percentages, positive predictive value of 60 percentages negative predictive value of 67.7 percentages (Table 10).

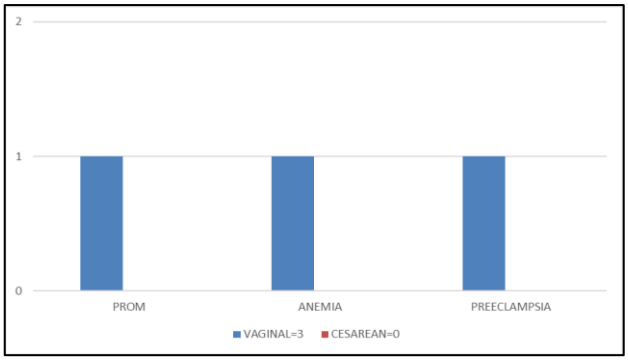

Figure 3: Distribution of still births according to CTG test with indication and mode of delivery, (n=3).

Table 1: RCOG criteria for interpretation of the admission test.[5]

Normal/reassuring trace	Suspicious /equivocal trace*	Abnormal /pathological trace
At least 2 accelerations (>15 bpm for > 15 sec) in 20 minutes	Reduced baseline variability (<5 bpm) for >40 minutes but <90 minutes although base line heart rate normal (110-160)	Silent base line variability (< 5 bpm) pattern > 90 minutes
Base line heart rate-110-160 bpm	Variable decelerations (depth <60 bpm and duration <60 seconds)	Base line heart rate >180 bpm or <100 bpm
Base line variability was 5-25 bpm	Early decelerations	Late decelerations
Absence of decelerations	Single prolonged deceleration <3 minutes	Atypical/ significant variable decelerations (depth >60 bpm and duration > 60 sec)
Moderate tachycardia (161-180 bpm)/ bradycardia (100-109 bpm) but with preservation of baseline variability and accelerations		Prolonged bradycardia (drop of the FHR<100 bpm for > 3 minutes or <80 bpm for >2 minutes
		Sinusoidal pattern > 10 minutes

*Absence of acceleration in the otherwise normal CTG tracing is of uncertain significance, bpm=beats per minute

Table 2: Indication of CTG in high-risk pregnancy.

Cases	N	Percentages (%)
Anemia	3	3.0
Diabetes	5	5.0
IUGR	4	4.0
Oligohydromnios	16	16.0
Pre-eclampsia	19	19.0
Postdated	21	21.0
Premature rupture of membrane	10	10.0
RH negative	9	9.0
Cord round the neck	13	13.0

Table 3: Demographic and clinical characteristics.

Variables	Normal		Suspicious		Nonreactive		Total, (n=100)	
	N	%	N	%	N	%	N	%
Age (years)								
20-25	26	55.3	8	17.0	13	27.6	47	47
26-30	32	76.1	2	0.04	8	19.0	42	42
31-40	7	63.6	0	0%	4	36.36	11	11
Total	65	65	10	10	25	25	100	100

Continued.

Variables	Normal		Suspicious		Nonreactive		Total, (n=100)	
	N	%	N	%	N	%	N	
Parity								
primigravida	36	63.1	8	14.0	15	26.3	59	59
P 1	19	67.8	2	0.07	7	25	28	28
P2	7	70	0	0	3	30	10	10
> P2	3	100	0	0	0	0	3	3
Total	65	65	10	10	25	25	100	100
Gestational age (Weeks)								
32-34	5	41.7	2	16.7	5	41.7	12	12
34-37	11	64.7	1	5.88	5	29.4	17	17
>37	49	69.0	7	9.8	15	21.1	71	71
Total	65	65	10	10	25	25	100	100

Table 4: Distribution of cases according to patterns of CTG.

Indications	Reactive	Non-reactive	Suspicious	Total
Anemia	1	2	0	3
Diabetes	5	0	0	5
IUGR	4	0	0	4
Oligohydromnios	14	1	1	16
Pre-eclampsia	10	6	3	19
Postdated	11	7	3	21
Premature rupture of membrane	4	6	0	10
RH negative	6	0	3	9
Cord round the neck	10	3	0	13
Total	65	25	10	100

Table 5: Correlation of CTG with Apgar score at 1 minute.

CTG pattern	Neonatal outcome (APGAR AT 1 min)					
	No asphyxia (7-10)		Moderate asphyxia (6-4)		Severe asphyxia (<4)	
	N	%	N	%	N	%
Reactive, (n=65)	60	92.3	4	6.1	1	1.5
Non-reactive, (n=25)	16	64	8	32	1	4
Suspicious, (n=10)	6	60	3	30	1	10

The chi-square statistic is 14.3074. The p=0.006376. The result is significant at p<0.05.

Table 6: Correlation of CTG with Apgar score at 5 minutes.

CTG pattern	Neonatal outcome (APGAR AT 5 min)					
	No asphyxia (7-10)		Moderate asphyxia (6-4)		Severe asphyxia (<4)	
	N	%	N	%	N	%
Reactive, (n=65)	60	92.3	4	6.1	1	1.5
Non-reactive, (n=25)	20	83.3	4	16	1	4
Suspicious, (n=10)	9	90	0	0	1	10

The chi-square statistic is 13.1531. The p=0.042545. The result is not significant at p<0.05.

Table 7: Correlation of CTG patterns with fetal distress.

CTG pattern	Admission test (n)		Fetal distress	
	N	%	N	%
Normal tracing	65	65	21	32.3
Non-reactive	25	25	14	56
Suspicious	10	10	7	70

The chi-square statistic is 2.9447. The p=0.229381. The result is not significant at p<0.05.

Table 8: Neonatal admission according to CTG test, (n=97).

NICU admission	Reactive, (n=64)		Non-reactive, (n=24)		Suspicious, (n=9)		Total	
	N	%	N	%	N	%	N	%
Yes	19	29.7	14	58.3	6	66.7	39	40.2
No	45	70.3	10	41.7	3	33.3	58	59.8
Total	64	100	24	100	9	100	97	100

The chi-square statistic is 9.9091. The p=0.007051. The result is significant at p<0 .05.

Table 9: Correlation between CTG patterns, NICU admission and mode of delivery, (n=97).

NICU admission	Normal delivery, (n=40)						Caesarean delivery, (n=57)						Total	
	Reactive		Non-reactive		Suspicious		Reactive		Non-reactive		Suspicious			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	8	24.2	2	50	1	33.3	11	35.5	12	60	5	83.3	39	40.2
No	25	75.8	2	50	2	66.7	20	64.5	8	40	1	16.7	58	59.8
Total	33	100	4	100	3	100	31	100	20	35.0	6	100	97	100

Table 10: Prediction of fetal distress.

Screening test results	Fetal distress present	Fetal distress absent	Total
Non-reactive+ suspicious (Abnormal CTG pattern)	21 (a)	14 (b)	35
Reactive (Normal CTG)	21 (c)	44 (d)	65

Fetal distress prediction results are significantly related to screening test findings (p<0.05) among total cases.

DISCUSSION

CTG is a screening test for the state of oxygenation of fetus on admission. The British guidelines do not recommend labour admission test in low-risk women while Swedish guidelines recommend this test in all women.[5]

A total of 100 high risk obstetric cases were chosen randomly and subjected to the CTG monitoring for fetal assessment. Most common indication of CTG monitoring were postdatism (21%), pre-eclampsia (19%) and oligohydramnios (16%). Indications of high-risk group are similar to the indications of Ingemarsson et al, Blix et al, Freeman et al and and Das et al.[6-9] Postdatism (21%) was the most common indication in our study which is similar to the Kumar et al (37%) study group but in contrary to our findings diabetes (43.1%) was the commonest high risk factor in Swati et al study group.[10,11]

Among 100 patients, maximum 59% were constituted by the primi gravida. High number of primi gravida was due to high number of pre-eclampsia in this group, small family norms, high number of referrals to tertiary care center. Our findings are similar to the findings of Kumar et al study.[10]

Majority of them (47%) fall under 20-25 years. Maximum cases (89%) were in age group of 20-30 year because of a childbearing age group. Non reassuring CTG was higher in the age group of 31-40 years and patients with gestational age of 32-34 weeks.

Out of 100 cases in this study group, reactive tracing was observed in 65% of cases, Suspicious tracing in 10% of cases and non-reactive in 25% of cases Similarly, Chaudhari et al reported reactive CTGs in 74% of their study sample, suspicious CTGs in 16%, and pathological traces in 10%.[12] In their study on 200 low-risk patients, Hegde et al reported that fetal distress was linked to suspected and pathological CTG on admission. Therefore, the frequency of operational deliveries also continued to increase. These findings consistent with our findings.[13]

The incidence of vaginal delivery was more common in reactive CTG (52.3%) than pathological CTG (20%) and suspicious category (40%) rate of caesarean section in pathological CTG (80%) and suspicious CTG (60%) is higher than reactive group (47.6%). P is significant 0.0209, which explains that admission CTG has significant association with operative delivery.

Similarly, in study of Behuriya et al 47.5% underwent LSCS in reactive and 81% in non-reactive category.[14] Mires et al and Impey et al reported that there is increased incidence of LSCS and instrumental delivery in pathological CTG group but the difference was not statistically significant.[15,16]

In our study there is statistically significant relationship (p<0.05) between CTG findings and Apgar score at 1 minute. Majority of patients with reactive CTG pattern had no asphyxia (92.3%), suspicious and non-reactive CTG pattern findings resulted in high number of moderate (30%, 32% respectively) and severe asphyxia (10%, 4% respectively).

At 5 minute there was non-significant relationship between CTG finding and neonatal outcome, p=0.042.

Contrary to our study Nazir et al where none of the patients with reassuring CTGs had their neonates admitted to NICU.[17] Only two patients out of 470 had babies with an Apgar score below 6, despite a normal CTG trace. This is because they had taken in all antenatal patients while we had included only high-risk patients. These findings favour the authenticity of admission CTG.

It is evident from (Table 9) that incidence of fetal distress was higher in nonreactive (56%) and suspicious CTG (70%). We observed that in reactive category, initial APGAR score was low in only 5 newborns, but later on 21 newborns of reactive group were also admitted in NICU. It was because we have included only high-risk cases with higher number of low birth weight, IUGR, hypoglycemia, septicemia, meconium and drug effects of $MgSO_4$ in pre-eclamptic patients. This finding was also similar in non-reactive and suspicious case. Hegde et al reported that fetal distress was linked to suspected and pathological CTG on admission.[13]

In non-reactive tracing (58.3%) and suspicious category (66.7%) required more admission to NICU as compared to reactive CTG which required in only 29.7% cases (Table10). There was significant correlation between CTG and NICU admission (p=0.007) Rahman et al. also observed similar finding to our study where NICU admissions were higher by nearly fourfold in the suspicious group compared to patients with reactive CTG. Simultaneously, there was a tenfold increase in MSL and low Apgar score in the pathological group[18.] In contrary to Lohana et al and Das et al NICU admissions were very high in Lohana (51.4%), very low in Das (9.6%) as reported 40.2% in our study.[9,19]

According to a study by Garg et al CTG is not a good index of fetal distress; despite reassuring CTG, 34.6% of infants were born with MSL, one-third had an Apgar score below 7, and around 20% were admitted to the NICU. Our study contradicted Gupta et al findings because most of the patients admitted to NICU had a pathological CTG on admission.[11] Moreover, our study endorsed findings by Panda et al. In their study, patients with reassuring CTG had reduced MSL rates (4.65%); only 3.48% had an Apgar score below 7, and 9.3% had NICU admissions. While patients in whom CTG was not reassuring, MSL increased dramatically to 85.71%, 1/3rd had a low Apgar score, and 78.57% were admitted to NICU.[20] In our study, the percentages of Apgar scores below 7 and NICU admission in cases with reactive CTG were 7.6%, and 29.7% compared to 36%, as well as 58.3% in the non-reactive CTG.

Sandhu et al did admission CTG in high-risk patients where they found that fetal distress observed in 15% of reactive group and 73% in non-reactive group. High incidence of fetal distress in our study may be due to inclusion of only high-risk cases which correspond with the study by Sandhu et al.[21]

Rates of caesarean section with NICU admission were higher in suspicious (83.3%) and nonreactive CTG category (60%) as compared with reactive category (35.5%). NICU admissions in Vaginal delivered newborns were lowest in reactive group (24.2%) and highest in nonreactive group (50%). In our study, 31 patients with reactive CTG, 20 patients with non-reactive CTG, 6 patients with suspicious CTG underwent a caesarean section. In reactive category caesarean section was done due to failure of induction, fetal distress in advanced labour, meconium-stained liquor, IUGR, cord around the neck, preeclampsia and oligo. In non-reactive tracings, caesarean was done due to fetal distress. Cesarean section was taken in suspicious CTG mostly, due to refusal by patients for high-risk vaginal delivery. Caesarean section was performed in 31 reactive CTG, out of which 11 newborns got admitted in NICU due to meconium-stained liquor, observation for hypoglycemia, prematurity and others.

Highest number of NICU admission was in diabetics (80%), postdatism (47.6%), PROM (44.4%) and cord around the neck in 38.4% of cases. We found that all newborns from diabetic mother had NICU admission due to associated hypoglycemia and observation of newborn. Least admission noted in IUGR (1%) and anemia (1%).

There were 3 stillbirths in the study group, one in each category. In our study we observed that the reason of still birth in reactive category was due to premature rupture of membrane followed by sepsis and prolong labour. One patient of nonreactive CTG pattern could not be taken earlier due to non-availability of blood in case of anemia. she delivered vaginally during waiting period for blood availability and newborn declared stillbirth due to hypoxia. Lastly one case of pre-eclampsia of suspicious CTG pattern, we opted for vaginal delivery due to associated coagulopathy. Newborn declared still birth due to prematurity and meconium aspiration syndrome**.**

In our study, fetal distress prediction results are significantly related to screening test findings ($p<0.05$) (Table 10). After the results we concluded that admission test in prediction of fetal distress has a sensitivity of 50%, Specificity of 75.9%, Positive predictive value of 60% and negative predictive value of 67.7%. Our results are similar to the results of Kushtagi et al and Rehman et al in terms of sensitivity (50%, 53% and 63% respectively) and positive predictive value (60% ,61% and 55% respectively) but in contrast to our study they both found the higher specificity (93%, 91%) and higher negative predictive value (91%, 93%).[18,22]

This study showed that it has low sensitivity (50%) and positive predictive value (60%) but high specificity (75.6%) and negative predictive values (67.7%) in predicting birth asphyxia. It is therefore highly effective in predicting newborns who are likely to be healthy but not so effective in predicting babies who are likely to develop asphyxia. The only disadvantage is that the obstetrician as

well as patient may have a sense of false belief when CTG is reactive. We were able to save the most of the babies in non-reactive and suspicious tracings by prompt termination of pregnancy when the baby was salvageable but we also lost 3 newborns of each category including reactive category. So, protocols using various other adjunctive test e.g., biophysical profile, colour doppler are also required for the improvement of perinatal outcome. Also, it cannot predict any acute asphyxia insult (e.g., Cord prolapse and abruptio placentae) during the labour hence still close monitoring of all high-risk pregnancy during labour is still required in all three categories of CTG.

CONCLUSION

CTG test is a simple, non-invasive screening test not a diagnostic tool. After CTG screening obstetrician should be able to assess that either fetus is healthy or compromised and needful intervention can be taken according to results. It is also important that a fetus who is already hypoxic or anaemic may have a normal baseline heart rate but additional changes like sinusoidal pattern, Reduced heart rate variability is not audible by stethoscope. Such findings may be easily missed, leading to adverse fetal outcome. Reactive CTG is reassuring and indicate fetal well-being but non-reactive and suspicious CTG alone cannot be taken as an indicator of poor neonatal outcome. In our study incidence of fetal distress and NICU admission was more frequent in those cases with non-reactive tracings. The APGAR score of the reactive CTG group was higher than non-reactive CTG group. Therefore, early prediction of fetal distress and early intervention can be initiated for better perinatal outcome. Thus, CTG could be a good option to identify the fetus at risk for developing intrapartum distress. The high specificity of the test helps to screen hypoxic fetus in busy labour ward and decreases neonatal morbidity and mortality. The use of cardiotocograph in monitoring high risk pregnancies may result in an increase in the incidence of LSCS as observed in our study. The heavy load of constant monitoring in high-risk patients can be reduced by using CTG monitoring. Thus, proving to be time saving method in intervention required in tertiary care centers with a heavy patient load.

ACKNOWLEDGEMENTS

Authors would like to thank all the resident doctors and nursing staff of the labour room and all the participants of the study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Singhal M, Kanwat B, Chauhan M, Chaubisa P. A study on cardiotocography for predicting fetal prognosis in high-risk pregnancy. Int J Reprod Contracept Obstet Gynecol 2023;12:874-82.