



## ROLE OF CTG IN HIGH RISK PREGNANCY AND COMPARISON OF CTG INTERPRETATION WITH PERINATAL OUTCOME

**Dr. Vineeta Ghangoriya**

Associate Professor

**Dr. Priyanka.Y**

M.S., Senior Resident Department of Obstetrics And Gynecology

**Dr. Kirti Nagesh**

M.S., Senior Resident Department of Obstetrics And Gynecology

**Dr. Reenu Markam\***

M.S., Senior Resident Department of Obstetrics and Gynecology. \*Corresponding Author

### ABSTRACT

**BACKGROUND:** Routine and continuous electronic monitoring of foetal heart rate (FHR) in labour has become an established obstetric practice. Cardiotocography (CTG) can be used as a predictor in detecting foetal hypoxia at the time of admission in labour.

**AIMS AND OBJECTIVES:** To study the role of CTG in high risk pregnancy and comparison of CTG interpretation with perinatal outcome.

**MATERIALS AND METHODS:** Present prospective observational study was performed on 200 high-risk pregnant women admitted in Department of obstetrics and Gynaecology, Netaji Subhash Chandra Bose Medical College and Hospital Jabalpur from March 2018 to August 2019. CTG monitoring was performed on the mothers and interpretations was made. Results of CTG were designated as reactive or non-reactive. The prediction of cardiotocography traces with perinatal mortality was recorded.

**RESULTS:** Out of 200 high risk pregnancies, most common indication for performing CTG was PIH (37%) followed by previous LSCS (16%), oligohydramnios (14.5%) and postdatism (11%). Out of 200 high risk cases, 131 (65.5%) had reactive CTG and 69 (34.5%) were non-reactive CTG. Out of 69 non-reactive cases, majority have surveyed whereas 9 (13.04%) died. Mortality rate was 4.5%.

**CONCLUSION:** Admission CTG test is simple, cost effective and non-invasive technique for detecting fetal hypoxia and predicting fetal mortality.

**KEYWORDS :** fetal physiology, fetal heart rate, hypoxia, perinatal mortality

### INTRODUCTION

Alteration in fetal physiology due to hypoxia is main culprit for fetal distress which increases the risk of fetal death. Fetal distress is the progressive in nature and require immediate correction in order to reduce the morbidity and mortality. (Edwin C 2008) So FHR monitoring plays the most important role in management of labouring patient when incidence of fetal hypoxia and progressive asphyxia increase. (Gupta M 2017)

Electronic fetal heart rate monitoring (EFM) can be performed with the help of cardiotocograph (CTG). (Capt GP 2008) CTG record the fetal heart rate (FHR) which can be detect the signs of intrapartum hypoxia for fetal well-being. Fetal well-being can be assessed using admission cardiotocography that will search of already prevailing high risk factors and also new factors that have recently appeared. (Rahman H 2012)

CTG is becoming a popular method to monitor fetal wellbeing and it is assisting the obstetrician in making decision on the mode of delivery to improve perinatal outcome. (Sultana J 2009) It is a dynamic screening test for the state of oxygenation of the fetus on admission of mother in labour room. (Vinita Das 2001, Sandhu VSM 2008)

Role of CTG in high risk pregnancy was extensively studied by previous author however, similar evidences are not sufficient in Indian setup. Hence in present study we tried to evaluate the role of CTG in high risk pregnancy and comparison of CTG interpretation with perinatal outcome.

### MATERIALS AND METHODS

The prospective study carried out in 200 high-risk pregnancy women admitted in Department of obstetrics and Gynaecology, Netaji Subhash Chandra Bose Medical College and Hospital Jabalpur from March 2018 to August 2019. Cardiotocography monitoring was performed on these mothers and interpretations made based on fetal heart rate, base line variability, number of accelerations and deceleration and CTG was then designated as reactive or non-reactive. The prediction of cardiotocography traces with perinatal mortality was recorded.

Women who had gestational age >37 weeks in first stage of labour with high risk factors like anemia, PIH diabetes mellitus, Rh negative,

PROM, IUGR, previous section, post diatism, BOH, oligohydramnios, decrease fetal movements were included whereas patient excluded in this study group were gestational age < 37 week and all antenatal patient without mentioned obstetric high risk factors were excluded from the present study.

**Table 1: RCOG guidelines for use of electronic fetal monitoring.**

Feature	Baseline (bpm)	Variability (bpm)	Deceleration	Acceleration
Normal	110-160	≥5	None	Present
Suspicious	110-109 161-180	<5 to ≥40 ≤90 min	Early deceleration, variable decelerations, Single prolonged deceleration for up to 3 mins	The absence of accelerations with otherwise normal trace is of uncertain significance
Pathological	<100 >180 Sinusoidal Pattern > 10 min	<5 for >90 mins	Atypical variable decelerations, Late decelerations, Single prolonged deceleration for more than 3 minutes	

All the data analysis was perform using IBM SPSS ver. 20 software. Frequency distribution and cross tabulation was performed to prepare the tables. All the data are as numbers and percentages. Chi-square test was performed to obtain the significance between categorical variables. P value of <0.05 is considered as significant.

### RESULTS

Out of 200 high risk pregnancies, most common indication for performing CTG was PIH (37%) followed by previous LSCS (16%), oligohydramnios (14.5%) and postdatism (11%). Out of 200 high risk cases, 131 (65.5%) had reactive CTG and 69 (34.5%) were non-reactive CTG. Out of 69 non-reactive cases, majority have surveyed whereas 9 (13.04%) died. Mortality rate was 4.5%.

**Table 2: Showing Demographic Parameters Of Study Cohort (n=200)**

Parameters		No of patients	Percentage
Age	≤20	20	10

	21-25	103	51.5
	26-30	55	27.5
	>30	22	11
Locality	Rural	112	56
	Urban	88	44
Monthly Income	≤5000	151	75.5
	5001-10000	34	17
	10001-15000	1	0.5
	15001-20000	9	4.5
	>20000	4	2
Religion	Hindu	180	90
	Muslim	20	10
No of ANC visits	<3	150	75
	4-6	39	19.5
	>6	11	5.5
Gestation age	<38	11	5.5
	38-40	158	79
	>40	31	15.5
Gravida	Primi	130	65
	Multigravida	48	24
	Grand Multigravida	22	11

**Table 3: comparing reactivity of CTG according to High Risk factor**

High risk	CTG trace		Total	Percentage	P value
	Reactive	Non-reactive			
Anemia	8	3	11	5.5	<0.001
GDM	8	2	10	5	<0.001
IUGR	6	4	10	5	0.874
Oligohydramnios	13	16	29	14.5	0.422
Postdatism	15	7	22	11	0.056
PIH	46	28	74	37	<0.001
Prev LSCS	24	8	32	16	<0.001
Rh negative	8	4	12	6	<0.001

**Table 4: Correlation between CTG reactivity and perinatal mortality**

Perinatal Mortality	Reactive	Non-reactive	P value
No	131 (100)	60 (86.95)	<0.001
Yes	0 (0)	9 (13.04)	
Total	131 (100)	69 (100)	

## DISCUSSION

CTG can observe the stressful process during labour and CTG trace can reflect fetal response to the ongoing hypoxic or mechanical stresses during labour such as compression of the umbilical cord or reduction in the placental blood flow. For high risk fetus, continuous fetal monitoring is mandatory for sustaining intrapartum hypoxic injury. It is also important to quickly diagnose 'accidents' related to labour (placental abruption, cord prolapse and uterine rupture) so as to institute timely and appropriate management to improve outcomes. In present study we tried to evaluate the role of CTG in high risk pregnancy and comparison of CTG interpretation with perinatal outcome in 200 high risk cases.

Out of 200 high risk cases, 131 (65.5%) had reactive CTG and 69 (34.5%) were non-reactive CTG. In line with present study findings Joshi et al reported that according to the 20 min admission CTG tracing done, 67% had reactive CTG, 21% had equivocal and 12% had ominous CTG. (Joshi H 2019) Similar reports were generated by previous study done by Hafizur R et al (Hafizur R 2012) and Xavier AA et al (Xavier AA 2015). In another similar study by Shantha et al 19 conducted in 100 high risk obstetric cases found reactive CTG in 89.9%, equivocal in 5.31% and ominous in 4.8%. (Shantha N 1999)

In present study most common indication for performing CTG was PIH (37%) followed by previous LSCS (16%), oligohydramnios (14.5%) and postdatism (11%). In a systemic review by Grivell et al also highlighted PIH and previous LSCS as the most common indication for performing CTG which is line with the present study findings. (Grivell RM 2015)

In present study out of 69 non-reactive cases, majority have surveyed whereas 9 (13.04%) died with a mortality rate of 4.5%. In line with present study findings a similar study from Rajasthan by Gupta et al reported that out of 74 non-reactive cases 9 babies (12.2%) had died and 65 (87.8%) were survived with total perinatal mortality rate being

4.5%. (Gupta M 2017)

Thapa et al reported that CTG was introduced as a screening test to detect compromised fetuses on admission and to select women in need of continuous electronic fetal monitoring during labor where there is lack of resources for its use in every patient. (Thapa J 2017) Findings of present study revealed that CTG can be used as important screening method for the high risk pregnancies which is also suggested by the previous study by Rahaman et al which highlighted the use of CTG in 'triaging' foetus of high risk pregnancy. (Rahman H 2012) Similarly Verma et al in agreement to present study findings concluded that CTG monitoring can be used as screening test in detection and timely intervention in high risk fetuses. (Vinita Das 2001)

## CONCLUSION

Based on the present study findings it can be concluded that admission test is an important screening tool for assessing the high risk pregnancies. Admission test has also shown its importance in predicting the perinatal outcome. Using CTG perinatal morbidity and mortality can be reduced. It has therefore concluded that Admission test is an effective technique in detection and early prediction of preexisting fetal distress and thereby plan early intervention to improve perinatal outcome.

## REFERENCES

- Gupta M, Nagar T, Gupta P. Role of cardiotocography to improve perinatal outcome in high risk pregnancy. International Journal of Contemporary Medical Research 2017;4(4):853-6.
- Edwin C, Arulkumaran S. Electronic fetal heart rate monitoring in current and future practice. J Obstet and Gynecol 2008;56:121-30.
- Capt GP, Sundhu GS, Raju R, Bhattacharyya Col KK, Shaktivardhan et al. Admission cardiotocography screening of high risk obstetric patient. 2008;64:43-5.
- Rahman H, Renjhen P, Dutta S, Kar S. Admission cardiotocography: Its role in predicting foetal outcome in high-risk obstetric patients. Australas Med J 2012;5:522-7.
- Das V, NidhiKatiyar, G.K. Malik. Role of Admission Test. J ObstetGynecol Ind. 2001;51:48-50.
- Joshi H, Pawar SM, Akanksha Singh A. Role of admission test by Cardiotocography (CTG) as a predictor of perinatal outcome: A prospective study. International Journal of Clinical Obstetrics and Gynaecology 2019; 3(2): 128-31.
- Hafizur R, Renjhen P, Dutta S, Kar S. Admission cardiotocography: Its role in predicting foetal outcome in high-risk obstetric patients. AMJ 2012; 5(10):522.7.
- Xavier AA, Pandey D, Dogra L, Lewis LE. Cardiotocography in a perinatal armamentarium: boon or bane? Int J Reprod Contracept ObstetGynecol 2015; (4):2000-4.
- Grivell RM, Alfirevic Z, Gyte GM, Devane D. Antenatal cardiotocography for fetal assessment. Cochrane Database Syst Rev. 2015;2015(9):CD007863.
- Thapa J, Sah R. Admission Cardiotocography in High Risk Pregnancies. NJOG 2017 Jan-Jun; 23 (1):50-4.
- Shantha N, Shyamla N, Shameem S. Evaluation for role of non stress test in high risk pregnancy. J ObstetGynecol India. 1999;33-5.
- Sultana J, Chowdhury TA, Begum K, Khan MH. Comparison of normal and abnormal cardiotocography with pregnancy outcomes and early neonatal outcomes. Mymensingh Med J. 2009;18( Suppl 1):S103-7.
- Sandhu VSM, Raju R, Bhattacharyya TK, Shaktivardhan. Admission cardiotocography screening of high risk obstetric patients. MJAFI. 2008;64:43-5.