

CTG monitoring and its correlation with intraoperative findings and perinatal outcome**Akshi Agarwal¹, Rajesh Goel^{2*}, Abhinav Agarwal³**¹*Assistant Professor, Department of Obstetrics and Gynaecology, SMS Medical College Jaipur, Rajasthan, India*²*Associate Professor, Department of Ophthalmology, SMS Medical College, Jaipur, Rajasthan, India*³*State Nodal Officer, Maternal Health Services, Department of Medical And Health Services, Jaipur, Rajasthan, India***Received: 06-08-2020 / Revised: 19-09-2020 / Accepted: 14-10-2020****Abstract**

Objectives- To identify non-reassuring FHS and using cardiotocography machine and correlate it with intraoperative findings and to find out perinatal outcome. **Materials and methods-** It is a case control interventional study done in Mahila Chikitsalay SMS Medical College Jaipur from Jan 2018 to Jan 2019 in which 180 patients with abnormal CTG findings were studied which were compared with control group of other 180 patients showing normal CTG, but in which caesarean section was done for any other indication. The results were statistically analysed for perinatal outcome, NICU admission and intraoperative findings. **Results-** Among 180 subjects of case group, there was a positive correlation between non-reassuring CTG and intraoperative findings with meconium stained liquor 47.77% (p value.01), cord around neck 44.44% (p value.001%), oligohydramnios 35.55% (p value.001), NICU admission 33.33% (p value.002). **Conclusion-** CTG monitoring is required certainly in labor room but judicious interpretation of FHS on CTG has to be done before taking up for caesarean section.

Key Words : CTG, Perinatal, monitoring

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Introduction

The most critical period of delivery of healthy baby to healthy mother is intrapartum period, when most of the physiological events take place. For this attempts have been made to find most reliable method for monitoring this critical period. CTG is also called as electronic fetal monitoring and is graphic representation of FHS and uterine contractions. It is a non-invasive investigation. Acute fetal hypoxia is most serious pathologic risk during labour and can effect perinatal outcome. In India perinatal mortality rate is 26 per one thousand live birth [1]. The number of fetal deaths because of hypoxia may be reduced by 60 % by electronic fetal monitoring [2]. CTG traces define fetal hypoxia in the form of fetal heart rate patterns as reassuring and non reassuring patterns.

Correspondence*Dr. Rajesh Goyal**

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E-mail: dr.goyalrajesh@gmail.com**Aims and objectives**

To find out the sensitivity of EFM in improving perinatal outcome by analysing FHS traces and intraoperative findings with their effect on fetal outcome.

Materials and methods

It was a case control interventional study conducted in Mahila Chikitsalay, SMS Medical College in the Department of obstetrics and gynaecology in time period of Jan 2018 to Jan 2019. Inclusion and exclusion criteria were applied. 180 cases with non-reassuring CTG findings were compared with 180 controls with reassuring CTG in which LSCS was done for some other indications. In patients with non-reassuring CTG traces initial resuscitative measures were taken like left lateral position, maternal oxygen, fast i.v fluid and stopping oxytocin. All the study subjects had caesarean section. Intraoperative findings for cause of fetal distress like oligohydramnios, cord around neck, meconium stained liquor were correlated.

These cases were analysed for perinatal outcome. Sensitivity, specificity, positive predictive value and negative predictive value of CTG as noninvasive investigation was taken out. Statistical tests were applied such as chi square test using spss data [3,4]. Maximum patients were booked in 20 to 30 age group in both cases and control group. The mean standard deviation of gestational age distribution was

38.45wks+/-1.07years. There was no significant correlation between age group, booking status and gestational age and parity and fetal heart rate patterns.

Results

47.77% cases with abnormal CTG had MSL whereas 7.77 cases with abnormal CTG had clear liquor. p value came out to be significant (.01)

Table 1: CTG trace and colour of the amniotic fluid

	Case	Control	Total
No. of Cases With Meconium stained liquor	86	14	100
No. of Cases without Meconium stained liquor	94	166	260
Total	180	180	360

P value-0.01 (S)

Table 2: Comparison of Case & Control Group with respect to oligohydramnios cases & normal amniotic fluid cases

	Case	Control	Total
No. of cases with Oligohydramnios	64	10	74
No. of cases with Normal Amniotic Fluid	116	170	286
Total	180	180	360

p value -0.001 (S)

35.55% cases with abnormal CTG had oligohydramnios and women with adequate amniotic fluid were 64.44%. It was found to be statistically significant.

Table 3: Comparison of Case & Control Group with respect to cord around neck cases & without cord around neck cases

	Case	Control	total
No. of cases with Cord around neck	80	9	89
No. of cases without Cord around neck	100	171	271
Total	180	180	360

p value -0.001 (S)

44.44% cases with abnormal CTG had CAN and women without CAN were 55.55%. p value.001.

Table 4: Comparison of Case and Control group with respect to placental infarction cases and without placental infarction cases

	Case	Control	Total
No. of Cases with Placental Infarction	10	1	11
No. of Cases without Placental Infarction	170	179	349
Total	180	180	360

p value -0.002 (S)

Table 5: APGAR score at birth and CTG trace in labour

	Case	Control	Total
Low APGAR Score	109	8	117
Normal APGAR Score	71	172	243
Total	180	180	360

p value -0.003 (S)

60.55% babies from case group had poor APGAR score and 39.44% babies from case group had normal APGAR score.

Table 6:CTG trace and shifting of baby to NICU or mother's side

Perinatal Outcome	Cases	Control	P value
Shifted to mother's side	140	168	0.01 (S)
Shifted to NICU	60	12	0.01 (S)
Total	180	180	

p value –0.002 (S)

Table 7:Tests and their findings

Test	Intraoperative findings	No Intraoperative findings
Non-reassuring CTG	175TP	5 FP
Reassuring CTG	25 FN	155TN

Sensitivity = True positive/ True positive + False Negative*100= 175/175+25 *100= 87.5%

Specificity=True negative/True negative+False positive*100= 155/155+5*100=96.87%

Positive Predictive value=True positive/true positive+false positive=175/175+5*100=97.22%

Negative predictive value=TN/TN+FN*100=155/180*100=86.11%

Discussion

Sunitha C.,P.S Rao et al 2017 studied 100 patients and found significant association of non reassuring CTG with meconium stained liquor,poor APGAR score ,admission in NICU. They concluded that electronic fetal monitoring is required certainly in labor rooms but judicious interpretation of FHS on CTG has to be done to reduce unjustified caesarean sections.Our results also correspond with their results.

Meena et al 2013 studied 2124 cases to find out fetal outcome in cases with meconium stained liquor during labor.They concluded meconium stained liquor should not be only criteria for caesarean sections but needs electronic fetal monitoring[4].

Bindu Kumar et al 2015 studied 600 women in labor for non reassuring FHS on CTG and meconium stained liqor.They concluded that E.F.M reduces hypoxia related deaths of neonate by 60%.They concluded that presence of non reassuring abnormal FHS in meconium stained liquor correlates well with increased risk of prinatal morbidity and mortality.They concluded that even with clear liquor if there was abnormal FHS on CTG the fetal outcome was not favourable.In Bindu kumar et al study the number of meconium stained liqor case were 86.3%, oligohydramnios was 67.9 and cord around neck was 14.13. In our study MSL was 47.7%,oligohydramnios 67.9%,and CAN was 41.1%.In both the studies the results were significant[3].

Meenakshi et al 2018 studied 191 cases of women who had abnormal CTG in a period of 1 year.There was statistically significant association with abnormal CTG to NICU admission.In such cases there was increased caesarean delivery.

Nasira Tasnim et al 2009 concluded pathological CTG have high predictive value of fetal acidosis and requires urgent caesarean section.

Conclusion

I conclude that E.F.M is required certainly in labor room but judicious interpretation of fetal heart rate on CTG has to be done before taking the patient for caesarean section.In this way timely pick up of fetal distress can be done and perinatal outcome can be improved.

Recommendation

Further ,larger studies must be conducted to approve the utility of CTG machines in labor rooms in more conditions and further more reduction of perinatal mortality rate worldwide.

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