



CTG – as an Admission Test to Predict the Perinatal Outcome

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ABSTRACT
Objective

To evaluate perinatal outcome of infants who had abnormal fetal heart rate tracing during admission to labor in comparison with normal tracing and to identify fetal hypoxia early in labor and decide on mode of delivery.

Study design:

It is a prospective case control study, 200 patients in active labor were randomly allocated into admission test group (100) and without admission test group (100). Test was repeated after 5 hours. The cardiotocographic traces were categorized as 5, 6. 1. reactive 2. equivocal 3. ominous.

Results:

Pregnancy outcome was assessed with respect to incidence of fetal distress during labor, operative deliveries, APGAR score at 5 min and neonatal intensive care admissions and compared b/w admission test group and without admission test group.

Conclusion:

The CTG is not very sensitive though it's specific in identifying the fetal distress. Admission test proved to be helpful in reducing the neonatal morbidity even when its sensitivity is low in detecting distressed fetus.

KEYWORDS

CTG, Perinatal outcome

Introduction:

The aim of the management of labor is to ensure the delivery of the healthy baby. Labor poses physiological stresses for fetuses during the transition from intra uterine to the extra-uterine environment. The commonest stress results from the intermittent interruption to maternal fetal oxygen transfer. Due to economic constraints, selection of patients for continuous monitoring or intermittent auscultation is necessary.

The admission test embodies the concept of performing a short period of fetal heart rate monitoring in relation to uterine activity at the onset of labor to identify fetuses at risk of distress in labor. These fetuses would require continuous fetal heart rate monitoring.

Materials and Methods:

This was a prospective case control study, carried out in Pariyaram medical college department of Obstetrics and Gynecology over a period of two years from 1-1-2014 to 31-12-2015. The study population consisted of 200 low risk patients in active labor admitted to the labor room.

Inclusion criteria: Singleton pregnancy with gestational age > 37 weeks, in cephalic presentation with intact membrane.

Exclusion criteria: multiple pregnancy, malpresentations, pregnancy with known congenital anomalies, patients who require elective LSCS.

Patients were first given the description of the procedure, they have to undergo after a preliminary history taking, thorough general and obstetric examination was done.

200 patients in active labor meeting inclusion and exclusion criteria were randomly allocated into admission test group

(100 patients) and without admission test group (100). In admission test group fetal heart rate was recorded with uterine activity for a period of 20 min and the test was repeated after 5 hours. The cardiotocographic traces were categorized as (5,6) 1. reactive, 2. equivocal and 3. ominous.

After the admission test, in reactive group fetal heart rate was auscultated for 1 min at half hourly intervals in first stage and after every uterine contractions in the second stage. In patients with equivocal trace, continuous fetal heart rate trace monitoring was done. In patients with ominous appropriate intervention was done immediately.

The pregnancy outcome was assessed with respect to incidence of fetal distress during labor, operative deliveries, APGAR score at 5 min and NICU admission and compared between admission test and without admission test group.

Result:

Out of 100 patients who underwent admission test, 81% patients had reactive admission test, 10% showed equivocal pattern, 9% had ominous trace. In patients with reactive admission test, 8 (9.8%) developed fetal distress. Thus admission test did not predict fetal distress during labor in 9.8% of patients. Whereas all patients who had ominous trace were taken for LSCS. Early intervention was taken considering that distressed fetus will not withstand the stress of labor. Majority of patients, 85% with reactive admission test had vaginal delivery, only 6.17% and 8.64% underwent LSCS and instrumental delivery respectively. In equivocal trace, number of vaginal delivery (40%) and LSCS were same.

In patients with reactive admission test, 6.17% and 3.7% underwent LSCS and instrumental delivery respectively for fetal distress. Hence admission test did not predict fetal distress

in 9.87% of patients. In patients with equivocal trace, early intervention had to be done for fetal distress, out of which 2 patients underwent LSCS and 2 had instrumental delivery. Thus in equivocal trace, admission test had given opportunity for early intervention in 40% of cases. All patients with ominous admission test were taken for LSCS, in view of fetal distress.

Majority of patients with reactive trace, 86.4% had either clear or thin meconium stained liquor. In equivocal traces, most of the patients (80%) had either clear or thin meconium stained liquor. All patients with ominous trace had meconium stained liquor. Admission test was false negative in predicting fetal distress during labor in 8 cases but only 4 newborns had poor perinatal outcome. In patients with equivocal trace and clear liquor perinatal outcome was good. In patients with ominous trace and thick meconium stained liquor perinatal outcome was poor which included 1 neonatal death. In ominous trace, false positive rate to predict perinatal outcome was 44.44%. This could probably be the result of an early intervention and hence improving the perinatal outcome.

In patients without admission test, majority of patients (73%) delivered spontaneously. 10% and 17% underwent instrumental delivery and LSCS respectively, in which 9% for fetal distress in instrumental delivery group and 15% for fetal distress in LSCS group. totally 24% of patients developed fetal distress in labor. In LSCS and instrumental delivery group, NICU admission for poor perinatal outcome was comparatively more (58% and 60% respectively) than the FTND group (11.26%). There was neonatal death in instrumental delivery group due to asphyxia.

Incidence of fetal distress was significantly more (24%) in patients where admission test was not done compared to those who had admission test (9.87%), as fetal distress was diagnosed early with ominous admission test and appropriate measures were taken immediately. Poor perinatal outcome and NICU admissions were significantly more in patients who did not undergo admission test than in those who had admission test done.

Table 1.

Discussion:

Classification of intrapartum CTG:

1. normal or reassuring : base line heart rate 110-150 bpm, base line variability of 5-25 bpm, presence of 2 accelerations of at least 15 bpm more than 15 seconds, absence of decelerations.

2. suspicious or equivocal : absence of accelerations for more

than 40 min, baseline heart rate 150-170bpm or 100-110 bpm, absent baseline variability (less than 5) or more than 40 with normal baseline with no decelerations, variable decelerations < 60 bpm for <60 sec, transient prolonged bradycardia <80bpm for >2min or <100bpm for >3min.

3. pathological or ominous: baseline fetal heart rate >50bpm with absent variability and/or repetetive late or variable decelerations, absent baseline variability (<5bpm) for more than 90min, complicated variable decelerations (>60bpm lasting >60sec), repetetive late decelerations, prolonged bradycardia (<80bpm for >10min), sinusoidal pattern with no accelerations.

Totally 21 patients (21%) developed fetal distress in labor. That is 8 of 81 with reactive admission test (9.87%), 4 of 10 with an equivocal admission test (40%) and all patients with ominous admission test (100%) were taken for LSCS in view of fetal distress. Thus in 8 patients (9.87%) admission test did not predict the fetal distress.

The equivocal admission test means caution, not action. The patient needs continous fetal heart rate monitoring or further tests to ensure fetal well being. The admission test which showed ominous trace had to be intervened early and appropriately. From an analysis of this study, it would be safe to conclude that reactive admission test could be followed by intermittent auscultation every 30 min in 1st stage and every 5 min after contraction in 2nd stage. In patient who did not go admission test, fetus which can not withstand the stress of labor was not identified early which led to more number of new borns with poor perinatal outcome and consequent increased NICU admissions. CTG as admission test showed low sensitivity though specificity is high. So it's not a good screening test on the basis of sensitivity but its low cost and ease of doing supports it's role as admission test.

Conclusion:

This study evaluates the use of CTG as a means of admission test for triage of cases requiring continuous monitoring. It tries to study the ability of the test to identify or predict the fetal distress at the time of admission to labor room. The CTG is not very sensitive though it's specific in identifying fetal distress. The study also evaluated the usefulness of the test by comparing with a group who did not undergo admission test and whether the early identification translated to reduced fetal morbidity by early intervention. The admision test proved to be helpful in reducing the neonatal morbidity even when it's sensitivity is low in detecting distressed fetus.

Table 1.

	No of patients	Mode of delivery			Indication			
		FTND	Instruental	LSCS	Fetal distress		other	
					Instrumental	LSCS	Instrumental	LSCS
Reactive AT	81	69 (85%)	5 (6.17%)	7 (8.64%)	3 (3.70%)	5 (6.17%)	2 (2.14%)	2 (2.46%)
Equivocal	10	4 (40%)	2 (20%)	4 (40%)	2 (20%)	2 (20%)	2 (20%)	2 (20%)
Ominous	9			9 (100%)		9 (100%)		
Without AT	100	73 (73%)	10 (10%)	17 (17%)	9 (9%)	15 (15%)	1 (1%)	2 (2%)

Table 2: NICU admission

	No of patients	Apgar <7 at 5'			NICU admission			Neonatal death
		FTND	Instrumental	LSCS	FTND	Instrumental	LSCS	
Reactive	81		1 (1.2%)	3 (3.7%)		1 (1.2%)	3 (3.7%)	
Equivocal	10	1 (10%)	1 (10%)	2 (20%)	1 (10%)	1 (10%)	2(20%)	
Ominous	9			5 (5.5%)			5 (5.5%)	1
Without AT	100	8 (8%)	7 (7%)	11 (11%)	8 (8%)	6 (6%)	10 (10%)	1

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8. Pankaj Desai, Umesh Gadhvi: Admission CTG as screening test for fetal distress: Obst Gynecol India May/June 2004: 54(3) 260-2 Table 1: Mode of delivery in Admission test and without admission test