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Original research article

Non-reactive NST and Negative CTG: Perinatal outcome in high risk pregnancy

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Abstract

The early identification of the fetus at risk from uteroplacental insufficiency due to maternal risk factors, placental disorders or foetal disease has become a major goal of perinatal medicine. The high risk groups and low risk group population were selected by history, clinical examination and relevant investigation. The study population consists of 229 women. Out of which 130 high risk patients and 99 low risk patients of Booked & unbooked cases from OBG OPD, wards, prelabour & labour room. The perinatal morbidity in the high risk group was 22 (16.9%) but the perinatal morbidity in the low risk group was 5 (5.05%). p value for high risk perinatal morbidity is 0.0027 which is statistically highly significant. p value for low risk perinatal morbidity is 0.0035 which is statistically highly significant. New born with of Apgar >7 at 5 minutes was 86.92% and 89.89% in high risk and low risk pregnancy respectively.

Keywords: Non-reactive NST, negative CTG, perinatal outcome

Introduction

Although widely considered the best method of delivery for the mother and the baby, a vaginal birth is not bereft of risks. Although the introduction of intrapartum fetal surveillance has not been able to make this journey any easier, it has certainly helped in making it much safer than it has ever been [1].

The primary purpose of the various antepartum surveillance techniques is to prevent fetal morbidity and mortality [1]. Hence different biophysical techniques have been devised to identify those babies that are at risk. The early identification of the fetus at risk from uteroplacental insufficiency due to maternal risk factors, placental disorders or foetal disease has become a major goal of perinatal medicine [2, 3].

Routine electronic fetal monitoring is accepted in high risk women but low risk women too require some reliable objective assessment to optimize the outcome [4].

Methodology

This prospective study was undertaken in Department of Obstetrics and Gynaecology.

Source of data

Women with high risk pregnancy, non-reactive NST/CTG and women with low risk pregnancy, non-reactive NST/CTG enrolled into the study from 34 weeks of gestation admitted in labour room.

Method of collection of data

The high risk groups and low risk group population were selected by history, clinical examination and relevant investigation. The study population consists of 229 women. Out of which 130 high risk patients and 99 low risk patients of Booked & unbooked cases from OBG OPD, wards, prelabour & labour room.

The inclusion criteria

- Patients of all age group who gave consent.
- Singleton non-anomalous pregnancies of 34 weeks or more weeks gestation.
- Only the NST or CTG performed within 7 days prior to delivery and at the admission for labour respectively were considered for fetal outcome.
- Patients with clinically suspected IUGR, pre-eclampsia, gestational diabetes mellitus, PIH (gestational hypertension), chronic hypertension, previous fetal demise, decreased or absent fetal movement, 3rd trimester bleeding, prolonged pregnancy, cardiovascular disease, rhesus iso-immunization, previous caesarean section, altered liver function test, adolescent pregnancy and oligohydramnios.
- Preterm labour more than 34 weeks.

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Exclusion criteria

- Sedative usage 24hrs before testing.
- Major congenital anomaly of the fetus detected by routine ultrasound screening.

Procedure of study

The patients were divided into 2 study groups one containing high risk pregnancies and control group of low risk pregnancies. Non-reactive NST/CTG were used for surveillance from 34 weeks of gestation.
Patients were first given a description of the procedure they had to undergo after a preliminary history taking, thorough general examination & obstetric examination. Informed consent was taken.
Later patients were subjected to the test using Sonicaid fetal monitor at speed of 3cm/min for 20 minutes after ensuring maternal hydration and food intake.
NST was recorded weekly, biweekly and on alternate days or even daily basis depending on the high risk factor and was followed up.
CTG recording of fetal heart rate and uterine contraction in labor for a period of 20 minutes was performed.

Results

Table 1: Distribution of Patients according to Perinatal Outcome

	Parameters	High Risk	Low Risk	Total	p value
NST Results	Apgar >7	75	28	103	0.0001
	Apgar ≤7	7	1	8	0.0027
	Perinatal Morbidity	7	1	8	0.0027
	Low Birth Weight (<2.5kgs)	61	23	84	0.0001
CTG Results	Apgar >7	38	61	99	0.0010
	Apgar ≤7	15	4	19	0.0035
	Perinatal Morbidity	15	4	19	0.0035
	Low Birth Weight (<2.5kgs)	37	57	94	0.00353

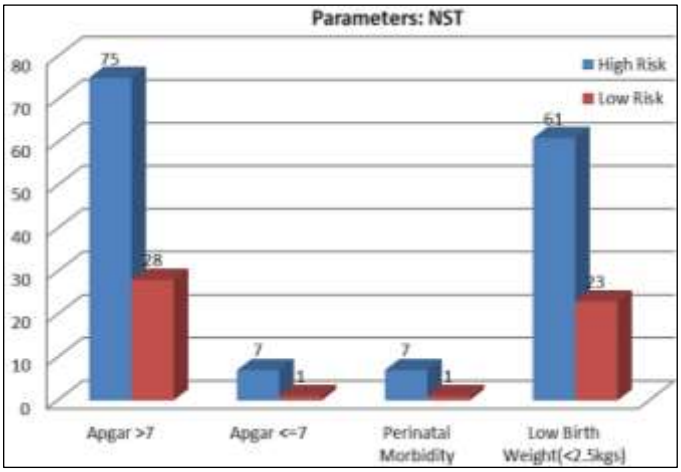

Fig 1: Distribution of Patients according to Perinatal Outcome with Non-reactive NST

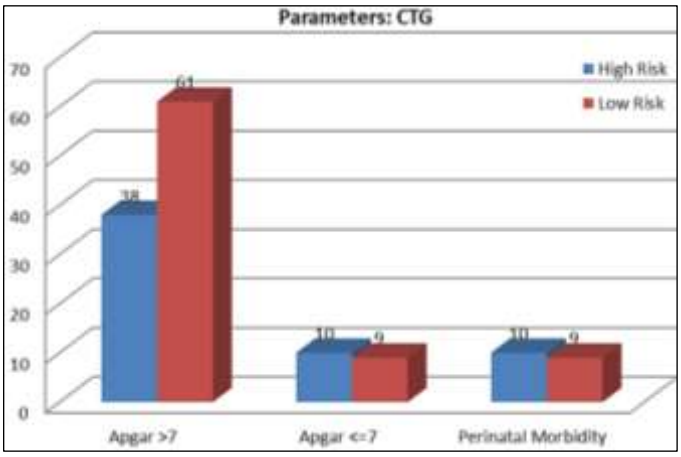

Fig 2: Distribution of Patients according to Perinatal Outcome with Negative CTG

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The perinatal morbidity in the high risk group was 22 (16.9%) but the perinatal morbidity in the low risk group was 5 (5.05%). p value for high risk perinatal morbidity is 0.0027 which is statistically highly significant. p value for low risk perinatal morbidity is 0.0035 which is statistically highly significant.
New born with of Apgar >7 at 5 minutes was 86.92% and 89.89% in high risk and low risk pregnancy respectively.

Discussion

The perinatal morbidity in the high risk group was 22(16.9%) but the perinatal morbidity in the low risk group was 5(5.05%).
Newborn with of Apgar >7 at 5 minutes was 86.92% and 89.89% in high risk and low risk pregnancy respectively.
Positive predictive value of non-reactive NST test is 85% non-reactive CTG 48% for caesarean sections done for fetal distress.
Overall, in total the incidence of vaginal delivery is 13.07%, incidence of instrumental delivery is 8.4% and incidence of operative delivery is 78.46% in high risk group.
With non-reactive NST/CTG trace false positive rate to predict perinatal outcome was 73% and 79% respectively; this could probably be the result of an early intervention and hence improving the perinatal outcome.
The use of NST in monitoring high-risk pregnancies may result in an increase in incidence of operative delivery as seen in our study ($p<0.001$), and hence associated high caesarean section rates has to be considered in such pregnancies. Abnormal NST/CTG was associated with significantly increased incidence of intrapartum foetal distress ($p<0.006$), meconium staining of liquor ($p<0.013$), low Apgar score at 5 minutes of birth ($p<0.0.002$) and perinatal morbidity ($p<0.003$) in the high-risk group, compared to the low-risk group. NST/CTG can be used effectively in both high risk and low risk pregnancies. This is because a normal NST/CTG has a high negative predictive value for mortality and morbidity. Hence, can reliably identify a healthy fetus [5].
The antenatal surveillance of high-risk pregnancies with NST can effectively screen for the identification of the high-risk fetus and delineate the population that is at risk for perinatal mortality and morbidity [6].
The potential advantages of separating patients in to high-risk and low-risk groups includes better allocation of resources in a busy labour suite and the potential to improve the outcome among parturient with abnormal NST result [7].
NST effectively identified all the perinatal morbidity cases in low risk group and hence had higher sensitivity in the low risk group compared to high risk group.
On the other hand an abnormal test has high false positive rates, hence does not reliably identify a compromised fetus in both the high and low risk groups. Therefore, an abnormal test NST should alert the clinician to consider the possibility of fetal compromise and has to be followed up by other biophysical tests [8].

Conclusion

In conclusion, NST/CTG is a valuable screening test for detecting fetal compromise in both high risk and low risk fetuses that may have a poor a perinatal outcome, but larger randomized controlled trials are needed to know if the use of NST/CTG in high risk and low risk pregnancies for antenatal surveillance, benefit by a reduction in the incidence of adverse perinatal outcome

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