



THIS STUDY ASSESSES THE ROLE OF NST IN DETECTING FETAL COMPROMISE IN CASES OF REDUCED MATERNAL PERCEPTION OF FETAL MOVEMENT

Obstetrics And Gynecology

Dr. Archana Kiran Department Of Obstetrics And Gynecology, Imambara District Hospital, Hooghly, West Bengal.

Dr. Umapada Mondal* Department Of Obstetrics And Gynecology, Imambara District Hospital, Hooghly, West Bengal. *Corresponding Author

Dr. Debarshi jana IPGIMER And SSKM Hospital, Kolkata

ABSTRACT

Introduction: In modern era of medicine, antenatal fetal monitoring is an essential way that assess the fetal well being.

Aims and objectives: This study was performed to test the association between non-stress test (NST) results and fetal and perinatal outcomes in pregnant women with perceived decrease in fetal movements attending our hospital.

To determine the role of Non stress test on fetal and prenatal outcome of pregnant women with perceived decrease in fetal movements attending labor room.

Materials and methods: Study is carried out at 'Imambara District Hospital', at the Dept. Of obstetrics and gynaecology, Hooghly, WB. All the pregnant mother with decreased fetal movement perception in the 3rd trimester, attending OBG (OPD) and ANC or getting admitted in Dept. OF OBSTETRICS AND GYNAECOLOGY, at IMAMBARA DIST. HOSPITAL, Chinsurah, Hooghly, WB. 1st May 2018 – April 30, 2019.

Conclusion: The antenatal surveillance of cases with reduced perception of fetal movement by mother with NST can effectively screen for identification of high risk fetuses and segregate the cases that are at risk for poor perinatal outcome.

KEYWORDS

fetal congenital anomalies, perceptionin, cardiotocography and intrapartum

INTRODUCTION

In modern era of medicine, antenatal fetal monitoring is an essential way that assess the fetal well being. All this is to appreciably change the present statistics of perinatal mortality and morbidity.

The association of specific intrapartum Fetal Heart Rate patterns with perinatal outcomes has led to the use of Fetal Heart Rate monitoring for investigating antepartum problems. This early identification of Fetal compromise brings in chance of effective and timely management in dropping the perinatal mortality and morbidity.

Fetal movements are considered as a sign of fetal life and well-being.¹ Maternal perceptions of fetal movements are the result of pressure against abdominal wall due to gross fetal movement or limb movement.² Monitoring fetal movements is a useful tool to assess fetal well being. The prevalence of decreased fetal movement perception in third trimester has been reported as 4-15% in various studies.¹ Association between maternal perception of decreased fetal movement and poor perinatal outcome in conditions like fetal growth restriction, oligohydramnios, fetal distress, preterm births, fetal congenital anomalies, and still birth are revealed in different studies.

The perception of fetal movements can be affected by the position of placenta (common in anterior), administration of corticosteroids in antenatal period, cigarette smoking, alcohol intake, use of sedative drugs, increased maternal blood sugar, even maternal position, activity.

It is also found that inadequate measures taken by the obstetrician to the complaints of decreased fetal movements is a contributor to poor fetal outcome³. In this perspective, decreased perception of fetal movement by the mother specially in the third trimester of pregnancy should be a cause of concern for obstetrician.

To prevent poor perinatal outcome, we will have to monitor closely both mother and fetus in the antepartum as well as in intrapartum period.

These can vary from simple repeat counting of fetal movements to hospital admission of mother during which repeated cardiotocography (CTG), bio-physical profile (BPP), Doppler studies, and even amnioscopy are performed.⁴

OBJECTIVES

To determine the role of Non stress test on fetal and prenatal outcome of pregnant women with perceived decrease in fetal movements attending labor room.

- Percentage of different types of non-stress test results in pregnant women presenting with complains of less fetal movements.
- Association of the different types of non-stress test (NST) results with mode of delivery (MOD).
- Association of the different types of non-stress test (NST) results with meconium stained liquor (MSL).
- Association of different types of non-stress test (NST) results with birth asphyxia defined by poor APGAR score less than 7.
- Association of different types of non-stress test (NST) with sick newborn care unit (SNCU) admission.
- Association of different types of non-stress test (NST) with neonatal outcome.

MATERIALS AND METHODS

Study site: Study is carried out at 'Imambara District Hospital', at the Dept. Of obstetrics and gynaecology, Hooghly, WB.

Study population:

All the pregnant mother with decreased fetal movement perception in the 3rd trimester, attending OBG (OPD) and ANC or getting admitted in Dept. OF OBSTETRICS AND GYNAECOLOGY, at IMAMBARA DIST. HOSPITAL, Chinsurah, Hooghly, WB.

Study period: 1st May 2018 – April 30, 2019

Study design: A Clinical Prospective observational study.

INCLUSION CRITERIA:

All pregnant women with decreased fetal movement and willing to give consent for the study having: Gestational age between 37-42 weeks. Singleton pregnancy. Cephalic presentation.

EXCLUSION CRITERIA:

Known case of high risk pregnancies like:

- Hypertensive disorders of pregnancy.
- Previous caesarean section pregnancy.
- Other medical disorders. E.g.: Gestational Diabetes Mellitus, Thyroid disease in pregnancy etc.
- Patients for elective caesarean section.
- Multiple pregnancies.
- Mal presentation.
- Ante partum haemorrhage
- Congenital anomalies
- Unwilling to participate in the study

STATISTICAL METHODS:

Sample size was calculated with help of Epi Info (TM) 3.5.3. EPI INFO which is a trademark of the Centres for Disease Control and Prevention (CDC). The SPSS 24.0 software was used for statistical analysis of data of this study. Chi square test was used to test the association of different study variables. t-test was used to compare the means. Significance level was set at ≤ 0.05 .

RESULT AND DISCUSSION

The test group consists of 80 cases at around 37 weeks or more gestational age with complain of reduced perception of fetal movement. For purpose of this study, the study population is divided mainly into three groups, depending upon NST results as:- Normal, Suspicious, Pathological (abnormal).

According to CTG tracings, this division is done according to updated 2015 FIGO fetal monitoring guidelines, the study groups were compared with various variables and parameters and were correlated.

We found that 18(22.5%) patients had 18-22 years of age, 26(32.5%) patients had 23-27 years of age, 25(31.3%) patients had 28-32 years of age and 11(13.8%) patients had ≥ 33 years of age. 36(45.0%) patients had G1, 26(32.5%) patients had G2, 16(20.0%) patients had G3, 1(1.1%) patient had G4 and 1(1.3%) patient had G5. 36(45.0%) patients had P0+0, 8(10.0%) patients had P0+1, 4(5.0%) patients had P0+2, 18(22.5%) patients had P1+0, 6(7.5%) patients had P1+1, 6(7.5%) patients had P2+0, 1(1.3%) patient had P2+1 and 1(1.3%) patient had P4+0.

Association of age in years vs. CTG classification was not statistically significant ($p=0.6475$). Association of gravida vs. CTG classification was statistically significant ($p=0.0342$). Association of parity vs. CTG classification was not statistically significant ($p=0.1917$).

It was found that 65(81.3%) patients were booked and 15(18.8%) patients were unbooked. We found that in normal CTG classification, 49(87.5%) patients were booked and 7(12.5%) patients were unbooked. In pathological CTG classification, 6(54.5%) patients were booked and 5(45.5%) patients were unbooked. In suspicious CTG classification, 10(76.9%) patients were booked and 3(23.1%) patients were unbooked. Association of booked / unbooked vs. CTG classification was statistically significant ($p=0.0343$).

Hofmeyr GJ et al⁵ (2012) found that various management strategies for DFM, including delivery, expectant management, cardiotocography (visual and computerised), ultrasound examination including Doppler ultrasound, and fetal arousal tests (cardiographic or clinical).

We found that 56(70.0%) patients had normal CTG classification, 11(13.8%) patients had Pathological CTG classification and 13(16.3%) patients had Suspicious CTG classification. It was found that 3(3.8%) patients had Instrumental, 35(43.8%) patients had LSCS (due to other obstetric indications), 18(22.5%) patients had LSCS (Abnormal CTG) and 24(30.0%) patients had SVD.

Raouf S et al⁶ (2015) found that the Non stress test (NST) is one of the significant diagnostic fetal wellbeing tests. Results of this study revealed that participants in study group with nonreactive NST results had more fetal complications than those with reactive NST results. NST was found to be a valuable diagnostic test for diagnosis of fetal distress during delivery in the latent phase. These findings of this study suggest that NST should be performed routinely as a valuable diagnostic test during the latent phase of delivery.

We found that 22(27.5%) patients had meconium stained liquor. It was found that 32(40.0%) patients had < 2.5 kg birth weight and 48(60.0%) patients had ≥ 2.5 kg birth weight. We found that 24(30.0%) patients had birth asphyxia.

We found that 6(7.5%) patients had babies with 5 APGAR score at 1 min, 18(22.5%) patients had babies with 6 APGAR score at 1 min, 1(1.3%) patient had babies with 7 APGAR score at 1 min, 31(38.8%) patients had babies with 8 APGAR score at 1 min and 24(30.0%) patients had babies with 9 APGAR score at 1 min. 1(1.3%) patient had babies with APGAR score 4 at 5 min, 6(7.5%) patients had babies with APGAR score 5 at 5 min, 17(21.3%) patients had babies with APGAR score 6 at 5 min, 19(23.8%) patients had babies with APGAR score 8 at 5 min and 37(46.3%) patients had babies with APGAR score 9 at 5 min.

Warrander LK et al⁷ (2012) found that maternal perception of reduced fetal movement (RFM) is associated with increased risk of stillbirth and fetal growth restriction (FGR).

It was found that 25(31.3%) patients had neonatal resuscitation procedure required. 25(31.3%) patients had SNCU stay/ SNCU admission. We found that 74(92.5%) patients had discharged and 6(7.5%) patients had expired.

It was found that in normal CTG classification, 2(3.6%) patients had instrumental, 35(62.5%) patients had LSCS (due to other obstetric indications) and 19(33.9%) patients had SVD. In pathological CTG classification, 11(100.0%) patients had LSCS (abnormal CTG). In suspicious CTG classification, 1(7.7%) patient had instrumental, 7(53.8%) patients had LSCS (abnormal CTG) and 5(38.5%) patients had SVD. Association of mode of delivery vs. CTG classification was statistically significant ($p<0.0001$).

We found that in normal CTG classification, 9(16.1%) patients had babies having meconium stained liquor. In pathological CTG classification, 11(100.0%) patients had babies having meconium stained liquor. In suspicious CTG classification, 2(15.4%) patients had babies having meconium stained liquor. Association of meconium stained liquor vs. CTG classification was statistically significant ($p<0.0001$).

In normal CTG classification, 16(28.6%) patients had babies with < 2.5 kg birth weight and 40(71.4%) patients had babies with ≥ 2.5 kg birth weight. In pathological CTG classification, 9(81.8%) patients had babies with < 2.5 kg birth weight and 2(18.2%) patients had babies with ≥ 2.5 kg birth weight. In suspicious CTG classification, 7(53.8%) patients had babies with < 2.5 kg birth weight and 6(46.2%) patients had babies with ≥ 2.5 kg birth weight. Association of birth weight vs. CTG classification was statistically significant ($p=0.0024$).

In normal CTG classification, 10(17.9%) patients had babies with birth asphyxia. In pathological CTG classification, 11(100.0%) patients had babies with birth asphyxia. In suspicious CTG classification, 3(23.1%) patients had babies with birth asphyxia. Association of birth asphyxia vs. CTG classification was statistically significant ($p<0.0001$).

Sambarey Pet al⁸ (2016) found that the perinatal outcome was noted as any one of: (a) Caesarean section (CS) for fetal distress, (b) 5 min APGAR score < 7 , (c) admission to the neonatal intensive care unit (NICU) for more than 24 h, and (d) neonatal mortality.

We found that association of APGAR score at 1 min vs. CTG classification was statistically significant ($p=0.0001$). Association of APGAR score at 5 min vs. CTG classification was statistically significant ($p<0.0001$). We found that in normal CTG classification, 11(100.0%) patients had babies who needed neonatal resuscitation procedure required. In pathological CTG classification, 11(100.0%) patients had babies who needed neonatal resuscitation procedure required. In suspicious CTG classification, 3(23.1%) patients had babies who needed neonatal resuscitation procedure required. Association of neonatal resuscitation procedure required vs. CTG classification was statistically significant ($p<0.0001$).

Panda S et al⁹ (2015) found that admission tests were performed in them and the results were statistically analysed. For predicting the outcome in low risk pregnancy, they adopted combined admission tests, i.e., NST, AFI and Umbilical artery Doppler in low risk pregnant women.

We found that in normal CTG classification, 11(100.0%) patients had babies who needed SNCU stay/ SNCU admission. In pathological CTG classification, 11(100.0%) patients had babies who needed SNCU stay/ SNCU admission. In suspicious CTG classification, 3(23.1%) patients had babies who needed SNCU stay/ SNCU admission. Association of SNCU stay/ SNCU admission vs. CTG classification was statistically significant ($p<0.0001$).

Olagbuji BN et al¹⁰ (2014) found that the unsatisfactory knowledge and poor perception behavior among respondents reflect the need for a guideline, particularly during antenatal care, on information and management of abnormal fetal movement in our setting to prevent avoidable stillbirth.

It was found that in normal CTG classification, 56(100.0%) patients

had been discharged in satisfactory condition. In pathological CTG classification, 6(54.5%) patients had discharged in satisfactory condition and 5(45.5%) patients had expired. In suspicious CTG classification, 12(92.3%) patients had discharged in satisfactory condition and 1(7.7%) patient had expired. Association of fetal outcome vs. CTG classification was statistically significant ($p < 0.0001$). We found that distribution of mean gestational age by LMP vs. CTG classification was not statistically significant ($p = 0.8505$).

In normal CTG classification, the mean gestational age by USG (mean $\pm$ s.d.) of patients was 37.2625 ± 1.2205 week & days. In pathological CTG classification, the mean gestational age by USG (mean $\pm$ s.d.) of patients was 38.0273 ± 1.8012 week & days. In suspicious CTG classification, the mean gestational age by USG (mean $\pm$ s.d.) of patients was 37.2923 ± 1.3751 week & days. Distribution of mean gestational age by USG vs. CTG classification was not statistically significant ($p = 0.2212$).

O'sullivan O et al¹¹ (2019) found that maternal perception of decreased fetal movements (DFM) is associated with increased incidence of stillbirth and intrauterine growth restriction. The rate of stillbirth was increased in women with DFM (OR 2.9). Some 26.6% of women perceiving DFM had a poor perinatal outcome. Some features of clinical assessment can identify patients at increased risk of poor perinatal outcome after presentation with DFM.

We found that distribution of mean birth weight vs. CTG classification was not statistically significant ($p = 0.5001$).

It was found that in normal CTG classification, the mean APGAR score at 1 min (mean $\pm$ s.d.) of patients was 7.9107 ± 1.1643 . In pathological CTG classification, the mean APGAR score at 1 min (mean $\pm$ s.d.) of patients was $5.7273 \pm .4671$. In suspicious CTG classification, the mean APGAR score at 1 min (mean $\pm$ s.d.) of patients was 7.9231 ± 1.1875 . Distribution of mean APGAR score at 1 min vs. CTG classification was statistically significant ($p < 0.0001$).

We found that in normal CTG classification, the mean APGAR score at 5 min (mean $\pm$ s.d.) of patients was 8.1429 ± 1.2853 . In pathological CTG classification, the mean APGAR score at 5 min (mean $\pm$ s.d.) of patients was $5.8182 \pm .4045$. In suspicious CTG classification, the mean APGAR score at 5 min (mean $\pm$ s.d.) of patients was 7.7692 ± 1.5359 . Distribution of mean APGAR score at 5 min vs. CTG classification was statistically significant ($p < 0.0001$).

Sheikh M et al¹² (2014) found that those cases with perception of decreased fetal movement when asked to count their fetal movement in third gestational trimester which is independently associated with

maternal employment, supine position on counting and not having daily exercise.

CONCLUSION

The antenatal surveillance of cases with reduced perception of fetal movement by mother with NST can effectively screen for identification of high risk fetuses and segregate the cases that are at risk for poor perinatal outcome.

The potential advantage of NST is that, a decrease in decision to delivery time can be made for those patients with fetal distress, so that a major improvement in the outcome can be achieved. The use of NST in monitoring cases with decreased fetal movement may result in an increase in the incidence of operative delivery, as seen in our study.

Almost 56[70%] cases had normal NST results, 13[16.3%] cases were in suspicious group and 11[13.8%] cases had pathological[abnormal] results. We found that normal NST results was more common in our study and most of them were booked cases which was statistically significant. It was found that 3[3.8%] cases had instrumental delivery, 35[43.8%] cases had LSCS, [due to other obstetric indications such as CPD, failed induction, premature rupture of membrane etc], 18[22.5%] cases had LSCS [due to abnormal NST results] and 24[30%] cases had spontaneous vaginal delivery. This association was statistically significant.

Association of low mean APGAR score at 5 minutes, more SNCU admission/stay, poor fetal outcome, more birth asphyxia, more cases with MSL was found to be statistically significant with non-reassuring [abnormal] NST results. Most of the fetuses of abnormal NST results cases needed neonatal resuscitation procedure [other than routine care], which was statistically significant too.

As a reactive NST results has a high negative predictive value for morbidity and mortality, hence can reliably identify a healthy fetus.

On the other hand, a non reassuring test has a significant false positive rate, hence does not reliably identify a compromised fetus. Hence abnormal results should alert the clinician to consider the possibility of fetal compromise and has to be followed by other tests.

As the test has high specificity, it has a role in identifying triaged fetuses in a centre with limited resources and heavy patient load. In conclusion, NST is a valuable screening test for detecting fetal compromise.

Routine electronic monitoring is accepted in high risk women, but normal pregnancies too require some reliable objective assessment to optimize the outcome.

Distribution of mean gestational age (in week & days) by LMP, gestational age (in week & days) by USG, birth weight, APGAR score at 1 min and APGAR score at 5 min: CTG classification

		Number	Mean	SD	Minimum	Maximum	Median	p-value
Gestational age (in week & days) by LMP	Normal	56	38.2304	1.5680	36.0000	42.0000	38.0000	0.8505
	Pathological	11	38.4636	1.6262	37.0000	41.0000	38.0000	
	Suspicious	13	38.0923	1.7633	36.0000	41.0000	37.0000	
Gestational age (in week & days) by USG	Normal	56	37.2625	1.2205	35.0000	40.0000	37.0000	0.2212
	Pathological	11	38.0273	1.8012	35.0000	40.2000	38.0000	
	Suspicious	13	37.2923	1.3751	35.0000	39.0000	37.0000	
Birth weight	Normal	56	3.1446	2.7587	1.8000	23.1000	3.0000	0.5001
	Pathological	11	2.3727	.3228	2.1000	3.0000	2.3000	
	Suspicious	13	2.5692	.4733	1.9000	3.3000	2.4000	
APGAR SCORE AT 1 MIN	Normal	56	7.9107	1.1643	5.0000	9.0000	8.0000	<0.0001
	Pathological	11	5.7273	.4671	5.0000	6.0000	6.0000	
	Suspicious	13	7.9231	1.1875	6.0000	9.0000	8.0000	
APGAR SCORE AT 5 MIN	Normal	56	8.1429	1.2853	5.0000	9.0000	9.0000	<0.0001
	Pathological	11	5.8182	.4045	5.0000	6.0000	6.0000	
	Suspicious	13	7.7692	1.5359	4.0000	9.0000	8.0000	

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