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A prospective study on correlation of non-stress test in high risk pregnancy at a tertiary care centre

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Abstract
Introduction: Perinatal outcome can be improved by timely prediction of antenatal risk factors contributing to complications, by providing appropriate antenatal surveillance. Non-stress test has the capacity to identify danger to the in utero fetus, which ensures well-timed intervention in order to attain best possible outcome.
Aims and Objectives: To evaluate the role of NST in high risk pregnancy with relation to perinatal outcome.
Materials and methods: The study was carried out in the Department of OBG, Sree Mookambika Institute of Medical Sciences, Kulasekharam over a period of 16 months. OPD Patients from Obstetrics and Gynecology department were included in the study. After thorough clinical examination, patients were subjected to NST. Clinical and NST data from the study was recorded as per the proforma.
Result: In high risk pregnant women, it was noticed that there was more fetal distress compare to normal pregnant women. The high risk group had a higher value of nonstress test compare to low risk group. There is high association between NST and low APGAR score at 5 min. Most common, indication for LSCS was fetal distress followed by GDM in High risk group, but previous LSCS in low risk group. Elderly primi was the commonest risk factor.
Conclusion: NST is simple, cheap, non-harmful, non-invasive, easily repeated, and cost effective with low maintenance profile and needs less training. It plays a crucial role in the monitoring of high risk pregnancies and henceforth, help to evaluate the optimal time for delivery and management.

Keywords: high risk group, low risk group, perinatal outcome, NST

1. Introduction

During the latter half of the twentieth century, various new techniques of antepartum fetal surveillance were invented, which have contributed significantly to a striking reduction in perinatal mortality and morbidity. One of the biophysical methods, which is being extensively used in the management of high risk pregnancies is Non Stress Test. High risk pregnancy is one which is complicated by factor that adversely affects the pregnancy outcome maternal or perinatal or both[1].Non stress test has the capacity to identify danger to the in utero fetus, which ensures well-timed intervention in order to attain best possible outcome.[1] High risk pregnancy is one that can unfavorably affect the mother and / or new born in the neonatal period. It is estimated that one fourth of the pregnancies, fit this group. Non Stress Test is basic, easy, uncomplicated and non-invasive and one which can be easily repeated, whenever required.[2-5]Non stress test is based on the fact that prolonged absence of fetal heart acceleration is noted in the presence of fetal hypoxemia. [5, 6] Non Stress Test is classified as reactive and non-reactive. [7, 8] Non stress test is based on the fact that fetal movement is associated with fetal heart rate accelerations- which in turn indicates an intact central nervous system. In the presence of fetal acidemia and the resultant hypoxia and neurological depression, though there is an initial increase in heart rate, the prolonged exposure results in a decreased rate. Gestational age influences acceleration or reactivity of heart rate[4].Motherhood is an experience, one filled with a spectrum of emotions. Though a joyful event, it is not always smooth sailing! It is true especially in recent years, as there has been an overall increase of complicated and precious pregnancies. This increase is attributed to the changing lifestyle that has been the trend in the modern world, an after effect of urbanization, industrialization and the increased incidence of late conception in order to pursue career goals by the parents. With acceptance of small family norm it has become necessary that every wanted conception should successfully end in birth of viable healthy baby. In order to ensure this, close monitoring for assessment of fetal wellbeing is required especially for high risk pregnancy [1]. Non stress test is easily available, inexpensive, non-invasive method that is used to monitor the pregnancy. It is an investigation that is easily reproduced, as and when required. In view of this, we conducted this study titled "Correlation of NST with fetal outcome in high risk pregnancy at a tertiary hospital". In order to evaluate the role of non-stress test in a high risk pregnancy, with the objective to see if an abnormal non stress test can be used to predict adverse perinatal outcome and to see if non stress test can adequately detect fetal distress at an early stage and thus help in decision making. The study also correlated the importance of early registration and regular antenatal check up in the case of all pregnancies, thus ensuring early noting

of high risk cases and their proper management.

Aims and Objectives

To evaluate the role of NST in high risk pregnancy with relation to perinatal outcome

Materials and Methods

He study was a prospective non-randomized observational study that was done at the Obstetrics outpatient department, Sree Mookambika Institute of Medical Sciences, Kulasekharam, on pregnant women who fulfilled the inclusion and exclusion criteria

Study Design: Prospective study.

Study Participants: Pregnant women in the third trimester.

Sample Size: $n=4pq/d^2$

P=Himabindhu etal[8] found out that 68.57 % non-stress reactive in vaginal mode of delivery

Q=100-p (31.43)

D=20% of p (188.01)

n= 46

Sampling Techinque: Convenient Sampling

a. Inclusion Criteria

- High-risk pregnant women with gestational age ≥ 32 weeks.
- Anaemia, Maternal Thyroid disorder, Diabetes, Renal disease, Chronic hypertension.
- Elderly primigravida (>30 years).
- Previous pre-eclampsia requiring delivery before 34 weeks' gestation, previous pre-eclampsia or gestational hypertension with delivery after 34 weeks' gestation.
- Previous spontaneous premature delivery.
- Previous low birth weight.
- Previous abruption, previous placenta previa.
- Previous LSCS.
- Previous stillbirth/early-neonatal death.
- Previous two miscarriage or induced abortion.
- H/o decreased fetal movements.
- Intrauterine growth restriction.
- Rh-isoimmunisation.

b. Exclusion criteria

- Pre /post natal diagnosis of a fetal chromosomal or structural abnormality.
- Women with multiple gestation
- Women with uterine malformation.
- Women with gestational age < 32 weeks.

No. of Groups Studied: Two groups were studied (each group of 46)

The study participants

Pregnant women attending Obstetrics and Gynaecology outpatient department, Sree Mookambika Institute of Medical Sciences, Kulasekharam, who fulfilled the inclusion and exclusion criteria, were selected. One group consisted of those women who were high-risk pregnancy. Second group/control group, consisted of women who were at low risk.

Data Collection Methods

Pregnant women attending Obstetrics and Gynaecology outpatient department, Sree Mookambika Institute of Medical Sciences, Kulasekharam, who fulfilled the inclusion and exclusion criteria, were considered for the study.

- Ninety two women were included in the study with 46 high risk cases and 46 in the control group. Patients selected were both emergency and registered patients attending the hospital for a period of one year.
- Procedure for the test was explained to the patient. A detailed history was taken which included the patient's education, occupation, socio-economic status, menstrual history, obstetric history; previous obstetrical events were asked in detail, past medical and surgical history and personal history.
- Symptoms suggesting presence of above-mentioned complications –example: oedema, headache, oliguria, giddiness, vision problem, decreased fetal movements were noted.
- A thorough general physical examination and obstetrical examination was done.
- Investigations -All preliminary investigations including Non Stress Test & USG done, along with follow up until their delivery.
- Patient undergo USG, which if normal, they are allowed to go home and review after one week. If USG surveillance indicated problems, admission and then intervention was indicated.
- Neonatal outcome, gestational age at delivery and postpartum complications, birth weight and APGAR score of the baby were noted. Pregnancy outcomes between the two groups were compared.

Results

The distribution of age in the high risk group ranges from 18 to 39 years. The mean age of study participants was 28.63 years with a standard deviation of 4.841 years. The distribution of age in the low risk group ranges from 20 to 30 years. The mean age of study participants was 24.20 years and a SD of 3.088 years. The distribution of gestational age in the high risk group ranges from 251 to 284days. The mean gestational age of study participants was 267 days and a SD of 6 days The distribution of gestational age in the low risk group ranges from 257 to 282 days. The mean age of study participants was 268 days and a SD of 4 days. 48% of the study participants in the high risk group were delivered by lower segment cesarean section and 8% in the low risk group delivered by lower segment cesarean section. Fetal distress was the main indication of LSCS in both high risk and low risk group. 26% of the study participants were reactive NST in high risk group and 8% in low risk group.

The distribution of foot length in the high risk group ranges from 6.7 to 8.3 cm. The mean foot length of study participants was7.69cm and a SD of 0.34 cm The distribution of foot length in the low risk group ranges from 6.5 to 8.3 cm. The mean foot length of study participants was 7.63 cm and a SD of 0.38cm. The distribution of crown heel length in the high risk group ranges from 32.8 to 50 cm. The mean crown heel length of study participants was45.05cm and a SD of 6.38 cm The distribution of crown

Heel length in the low risk group ranges from 32.8 to 50 cm. The mean crown heel length of study participants was 45.05 cm and a SD of 6.38cm.

In this study it is found that non stress test have no statistically significant association with mode of delivery in high risk group and low risk group (p>0.05). In this study it is found that non stress test have no statistically significant association with appropriate for gestational age in high risk group and low risk group (p>0.05). In this study it is found that non stress test have statistically significant association with live/still birth in high risk group (p0.05).

Discussion

NST is a common type of assessment to identify the risk factors in pregnant women. Many studies have been carried out previously to evaluate the efficiency of this test but there is no consensus to establish the prognostic value among different groups of pregnant women [9]. Researchers have considered NST as a useful tool especially in high-risk pregnancies. Non stress test is a non-invasive procedure that is relatively simple as compared to other tests [10].There have been many earlier studies that extensively discuss the probability of adverse outcomes such as meconium stained amniotic fluid, low APGAR score, and NICU admission. A reactive NST is a reliable indicator of fetal wellbeing in term fetus. It is considered as an ideal procedure to be used in low resource areas that screen antenatal cases and early intervention measures for minimizing perinatal morbidity. Antenatal fetal monitoring is done to identify the fetuses that are at a higher risk of intrauterine death. Intervention can be done in these cases before the damage happens. The main goal of antepartum surveillance methods is to identify fetal distress and thereby prevent fetal death. The study classifies pregnant women into both high risk and low risk. There are many organized methods available for managing the high risk group. In the same time, there needs to be more comprehensive methods to identify pregnant women in distress in the low-risk group. NST is identified as a useful tool to avoid obstetric litigation as parental expectation of a good outcome is extremely high.

The present study lists out the risk factors that could help in identifying the high-risk group. Factors like GDM, Gestational Hypertension, IUGR, IVF, and previous LSCS was compared with a study by Swati *et al* [11]. The percentage of GDM in our study was 17.4% while than in Swati *et al* [11]. it was 43.10%. A study conducted by Lohana *et al* [12]. Indicated the Meconium stained to be 33.33% in comparison to 39.1% as in a study by Schifrin *et al* [13]. In another study by Patil *et al* [14], Imam Bano et al [15]. and Shreshtha *et al* the value of meconium stained was 34%, 42.8% and 10.9 % respectively. The less quantity of liquor (Oligohydramnios) was found to be 17.40% comparable to 7.80% in a study by Swati *et al* [11].

Conclusion

NST is simple, cheap, non-harmful, non-invasive, easily repeated, and cost effective with low maintenance profile and needs less training. Reactive NST is reassuring and indicates fetal wellbeing, but non-reactive NST alone cannot be taken as an indicator of fetal jeopardy. Ante partum fetal monitoring has proved to be beneficial in assessing the fetal wellbeing, when employed in time the perinatal morbidity and mortality can be reduced. In the present study, we noted the following findings, Probability of adverse outcome such as meconium stained amniotic fluid, low APGAR score, NICU admission increased with non-reactive NST. Hence this simple test could be a good option to use in low resource centres, to screen antenatal cases and early intervention measures for reducing perinatal morbidity. NST was reactive in 74% and nonreactive in 26% high risk group. Fetal death rate is lower in population undergoing antepartum testing as compared to general untested population. Protocols using adjunctive tests (Biophysical profile, color Doppler) helps to further improve obstetric outcomes. We are able to save the babies in cases of non-reactive non-stress tests by prompt termination of pregnancy when the baby was salvageable.

References

1. O'neill E, Thorp J. Antepartum evaluation of the fetus and fetal well-being. Clinical obstetrics and gynecology. 2012; 55(3):722.
2. Restriction G. Screening, Diagnosis and Management. SOGC practical Guideline. J. Obstet. Gynaecol. Can. 2013; 35(8):741-8.
3. Lear CA, Westgate JA, Ugwumadu A, Nijhuis JG, Stone PR, Georgieva A, *et al*. Understanding Fetal Heart Rate Patterns That May Predict Antenatal and intra partum Neural injury, in Pediatric Neurology.4th,issue-Fetal Neurology, Elsevier. https://doi.org/10.1016/j.spen.2018.05.002
4. Cypher RL. Antepartum Fetal Surveillance and Prenatal Diagnosis. Core Curriculum for Maternal-Newborn Nursing E-Book. 2015; 12:135.
5. Gegor CL, Paine LL, Johnson TR. Antepartum fetal assessment: a nurse- midwifery perspective. Journal of Nurse-Midwifery. 1991; 36(3):153-7.
6. Gree NB, MB G, Dr UZIN ML. Antepartum fetal evaluation. Obstetrics: Normal and Problem Pregnancies E-Book. 2016; 18:219.
7. Solt, Divon MY. Fetal surveillance tests, in The Embryo: Scientific Discovery and Medical Ethics. Karger Publishers, 2005, 291-308.
8. Himabindu P, Sundari MT. Evaluation of Non Stress Test, in Monitoring High Risk Pregnancies, OSR Journal of Dental and Medical Sciences (IOSR-JDMS) e-ISSN: 2279-0853, p-ISSN: 2279- 0861. 2015; 14(4):40-42
9. Kiettisanpipop P, Phupong V. Intra partum and neonatal outcome of screening non-stress test (NST) compared with no screening NST in healthy women at 40–40 (+ 6) weeks of gestation. Journal of Obstetrics and Gynaecology Research. 2015; 41(1):50-4.
10. Sabhaya N, Patil Y, Patil S, Patange R. Utility of non-stress test and umbilical artery Doppler study in high risk pregnancies. Journal of Evolution of Medical and Dental Sciences. 2017; 6(6):455-61.
11. Garg S, Gupta A, Madhavan J. Non-stress test as an admission test to assess the outcome in high-risk pregnancy. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2016; 5(11):3993-4000
12. Lohana RU, Khatri M, Hariharan C. Correlation of non-stress test with fetal outcome in term pregnancy (37-42 Weeks). International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2016; 2(4):639-45.
13. Schifrin BS, routine fetal heart rate monitoring in the

antepartum period, Journal obstetrics and gynecology. 1979; 54(1):21-5.
14. Patel S, gupta S. correlation of admission NST in low risK pregnancy with neonatal outcome, American journal of ethnomedicine, 2015, 2(2).
15. Imam bano, lata motwani, comparative study of NST and fetal acoustic stimulation for assessment of fetal well-being. 2012; 3(2):168-171.