ORIGINAL RESEARCH PAPER

Gynaecology

ROLE OF NST IN HIGH RISK PREGNANCY.

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ABSTRACT

Background: Perinatal deaths are still a significant problem in India. Therefore, there is a need for effective fetal surveillance, in order to improve the outcomes of pregnancy.

Methods: This was a prospective study including fifty one females with high-risk pregnancy. The included participants were subjected to NST done using a cardiotocograph with ultrasound transducer placed on maternal abdomen for duration of 20 min. The NST results were classified into reactive and non-reactive. Subjects were then followed up for mode of delivery and different variables of perinatal outcome.

Results: Majority of study subjects were in the age group of 26-30 years (n=24; 47.1%). The period of gestation in 36(70.6%) subjects was 37-38 weeks. Gestational diabetes mellitus was the most common risk factor in the high-risk subjects (n=22; 43.1%).The NST was non-reactive in 6 high-risk subjects. Only 2 subjects had a vaginal delivery.

Conclusions: NST is a promising basic screening tool in pregnancy to assess fetal well-being. Both the perinatal mortality and morbidity is high in high risk patients.

INTRODUCTION:

Recently, there has been a significant decrease in maternal mortality in developing countries.1 However, in India alone, about 8,90,000 perinatal deaths occur annually. Although the need for fetal surveillance is well acknowledged now, antepartum evaluation of the fetus at risk for damage or death in utero continues to be a major challenge in modern obstetrics.2 Traditionally, obstetricians classify pregnant women as "low" and "high" risk. Therefore, there is a need for a test, which can be used to screen all pregnancies.1,3 The fact that the main purpose of the various antepartum surveillance techniques is to detect fetal distress in order to prevent fetal death need not be overemphasised.4There is no single test which is ideal for all high risk fetuses.5 Non-stress test is an easy test to perform and normal value will predict good fetal wellbeing for the next few hours in labor.1 This test is most commonly used for antepartum evaluation of the fetal status. It is noninvasive, easily performed and interpreted, and readily accepted by patients. The test looks for the presence of temporary accelerations of the fetal heart rate (FHR) associated with fetal movement.6 Therefore, admission NST will help to detect high risk fetus and further course of action is decided based on the test result. The current study was conducted to analyse the predictive value of NST as an admission test in evaluating perinatal outcome in high risk pregnancy.

METHODS:

Women with high risk pregnancy above 32 weeks of gestation attending the antenatal clinic from June 2013 to June 2014 were included in the study. Informed consent was obtained from all the patients. Ethical clearance was obtained from the Institutional Ethics Committee.

Inclusion criteri:

• Females with high risk singleton pregnancies ≥32 week's period of gestation.
• Only NST performed 7 days prior to delivery were considered for the fetal outcome.
• Women were classified as high risk based on age, height, parity, blood pressure, haemoglobin, period of gestation, rupture of membranes or any other risk factor like, Preterm Premature rupture of membranes(PPROM), Primary infertility with GDM, IUGR, Preeclampsia, Hypertension, Gestational diabetes mellitus, previous fetal demise, Decreased fetal movements, Anemia, third trimester bleeding, post-dated pregnancy, Rh negative pregnancy, Antiphospholipid antibody syndrome, seizure disorder(epilepsy), Oligohydramnios, Previous LSCS, Polyhydramnios, Preterm labour and advanced maternal age.

Exclusion criteria:

• Pregnancies less than 32 weeks period of gestation.
• Females with multiple pregnancies.
• Major congenital anomaly of fetus detected on routine ultrasound scanning.

Methodology:

This was a prospective, observational study carried out between June 2013 and June 2014. Fifty one females with high-risk pregnancy were included in the study. Data was collected on a prestructured proforma. The included participants were subjected to NST. NST was done using a Cardiotocograph with ultrasound transducer placed on maternal abdomen for duration of 20 min.

The NST results were classified into two groups:
Reactive and Nonreactive.

Subjects were then followed up for mode of delivery and different variables of perinatal outcome including

perinatal mortality, fetal distress during labor, 5 min Apgar score, meconium stained amniotic fluid.

Statistical analysis:

Dichotomous data are summarized as percentages. Continuous data are reported as mean and standard deviation. Other relevant statistical methods were employed wherever necessary using SPSS 22 version.

RESULTS

A total of 51 females with high risk pregnancy were included in the study. Table 1 show the age-wise distribution of the subjects. Maximum subjects were in the age group of 26-30 years (n=24; 47.1%), followed by 21-25 years (n=11; 21.6%).

**Table 1 : Age-wise distribution of study subjects.**

AGE GROUP	18-20	21-25	26-30	31-35	>36
NUMBER	2	11	24	10	4
PERCENTAGE	3.9	21.6	47.1	19.6	7.8

Of the various risk factors observed in the pregnancy, which were used to categorise the latter as high-risk, gestational diabetes mellitus was present in 22 (43.1%), pregnancy-induced hypertension in 5 (9.8%) and anemia was present in 1 (2%; Table 2). Other risk factors observed are shown in figure 1.

Table 2 Gestational diabetes mellitus, hypertension and anemia in the subjects in the high-risk group

	Gestational DM	Hypertension	Anemia
No	29	46	50
	56.90%	90.20%	98.00%
Yes	22	5	1
	43.10%	9.80%	2.00%

The period of gestation was between 37-38 weeks in 36 (70.6%) subjects, 35-36 weeks in 12 (23.50%) and 32-34 weeks in 3 (5.9%; Figure 2) .None of the patients presented at gestational age >39 weeks.
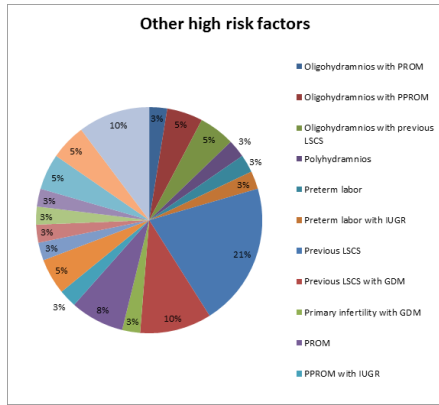
Figure 1 showing other risk factors.
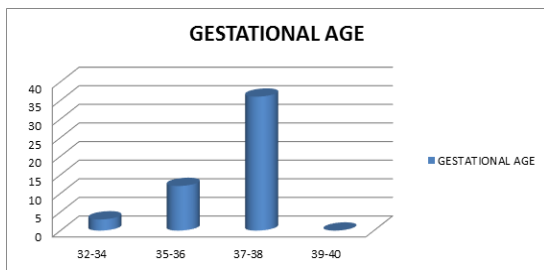
Figure 2 showing gestational age at presentation.

When an NST was done in the study subjects, 6(11.8%) patients had a non-reactive NST. While Doppler study was performed in 7 subjects, of whom, it was abnormal in 4(7.8%). Results as shown in table 3 and 4 respectively.

Table 3 showing result of NST.

NST RESULT	REACTIVE	NON-REACTIVE
NUMBER	45	6
PERCENTAGE	88.2	11.8

Table 4 Showing result of Doppler study.

| DOPPLER STUDY	ABNORMAL	NOT DONE	NORMAL
NUMBER	4	44	3
PERCENTAGE	7.8	86.3	5.9

In the high-risk patients, of the 51 subjects, only 2 (3.93%) had vaginal delivery, while 21 (41.17%) underwent elective LSCS and 28 (54.9%) emergency LSCS. As shown in table 5.

Table 5 Showing mode of delivery.

MODE OF DELIVERY	ELECTIVE LSCS	EMERGENCY LSCS	VAGINAL DELIVERY
NUMBER	21	28	2
PERCENTAGE	41.17	54.9	3.93

When the APGAR score was calculated, 15 (29.4%) had a score ≤7. Thirty six (70.6%) had a score >7 (Figure 3).11 neonates born to high-risk patients were admitted to the NICU (figure 4). One neonate required ventilatory support who recovered after few days.

Figure 3 APGAR scores of new borns
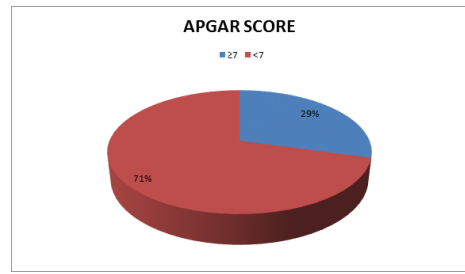
Figure 4 NICU admission rate of neonates.
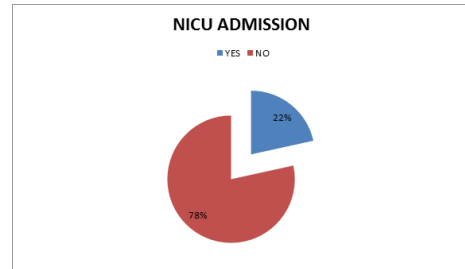
DISCUSSION:

In our study, we found that NST is an effective screening test to assess fetal well-being in women who are over 32 weeks pregnant. We included 51 females with high risk pregnancy, till date, only Biswas et al.[7] compared the use of NST in women with high-risk vs. low-risk pregnancy however, the ratio of high-risk: low-risk was 8:2. Recent studies have been conducted either in high-risk groups[2,7] or low-risk groups.[1,3] In our study, about 47.1% of subjects were in the age group of 26-30 years, followed by 21-25 years (21.6%). However, in the study by Himabindu et al.,[2] 50% of subjects were in the age group of 21-25 years, followed by 26-30 years and 18-20 years (23% each). In the study by Lohana et al.,[3] 83% of subjects were in the age group of 21-30 years, and 15% were between 18-20 years old.

We included women >32 weeks of gestation. Biswas et al.[7] evaluated women with >28 weeks of gestation, Himabindu et al.[2] included women with >30 weeks of gestation, and Lohana et al. and Patel et al.[1,3] included women with >37 weeks of gestation. In our study, the period of gestation was between 37-38 weeks in 70.6% followed by 35-36 weeks in 23.5%.

Gestational diabetes mellitus was the most common risk factor, present in 43.1% of cases, followed by oligohydramnios in 21.8% and pregnancy-induced hypertension in 9.8%.With respect to the NST results, we found the number of non-reactive cases in the high-risk patients to be lesser compared to that in the study by Himabindu et al.[2] (7/51 vs. 30/100 respectively). Lohana et al.[3] showed that at 37 weeks of gestation, 1 of 100, at 38 weeks, 2/90, at 39 weeks 2/59, at 40 weeks 6/18 and at 41 weeks 4/10 subjects had a non-reactive NST. In the study by Patel et al.,[1] 18/350 low-risk pregnant women had a non-reactive NST. Based on findings from other reports as well as our study, we can imply that the incidence of non-reactive NST was less in our study.

We performed umbilical artery Doppler study in 7 subjects, of whom, it was abnormal in 4,. El-Edessy et al.,[8] in a recent study, report that umbilical artery doppler is a promising screening test in high risk pregnancies and is associated with better maternal and neonatal outcomes.

Out of the 51 subjects, only 2 (3.92%) had vaginal delivery, while 21 (41.1%) underwent elective LSCS and 28 (54.9%) emergency LSCS. The rate of LSCS was higher in our study compared to that by Himabindu et al.[2] (54% women underwent LSCS). In the study by Patel et al.,[1] 14.84% with reactive NST and 66.66% with non-reactive NST underwent LSCS.

Among those with a non-reactive NST, 3 (50%) neonates of subjects had an APGAR score of ≤7. Similar findings were observed

in the study by Himabindu et al.,[2] where the neonates of 14/16 high-risk subjects with non-reactive NST had an APGAR score of ≤7. In the study by Patel et al.,[1] 61.1% of neonates of low-risk pregnant women with non-reactive NST had an APGAR score of ≤7.

Neonates born to 11 subjects were admitted to the NICU. One neonate born to a subject in the high-risk group required ventilatory support. Of the neonates born to the 6 non-reactive NST cases in our study, 3 (50%) required admission to NICU, while in the study by Himabindu et al.,[2] the mothers of all 13 neonates admitted to NICU had a non-reactive NST. Similar to our study, Patel et al.[1] demonstrated that 44.1% of neonates of mothers with a non-reactive NST required NICU admission.

CONCLUSION

NST is a promising basic screening tool in pregnancy to assess fetal well-being. In the high risk patients majority of them underwent LSCS. The APGAR score was low in most high risk patients. However, its employment more frequently in high-risk cases along with other tests, like doppler velocimetry might prove to be effective in identifying fetal distress, and aid in effective management, in order to improve the outcomes of pregnancy. In this study we performed umbilical artery Doppler which was abnormal in 4 subjects. Both the perinatal mortality and morbidity is high in high risk patients.

References
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