

CRITICAL APPRAISAL OF UTERINE ACTIVITY PRODUCED BY NIPPLE STIMULATION STRESS TEST IN HIGH RISK PREGNANCIES

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SUMMARY

Eighty four contraction stress tests (CST) by nipple stimulation were performed on fifty high risk patients. The women were asked to stimulate one nipple under cover of clothes with thumb and fore finger. Average time required from start of test to first contraction produced was ten minutes. CST by nipple stimulation was simple and easy to perform and adequate uterine activity was obtained in 97.7%. An overall negative CST was found in 88% and positive CST in 10%. A positive CST is less indicative of a poor fetal prognosis as compared to negative CST as an indicator of good prognosis but non-reactive non stress test (NST) with positive CST indicates sinister prognosis. CST gives better reflection of utero-placental insufficiency as compared to NST. Exaggerated uterine activity was present only in one case without late deceleration and fetal outcome was good. In the present series there was no neonatal death.

Introduction

Antepartum fetal heart rate testing has gained wide acceptance in the evaluation of fetus at risk for chronic placental insufficiency. Although non-stress test has replaced contraction stress test as the primary test for assessment of fetal well being, the contraction stress test continues to be useful.

Hammacher (1966) appears to be first to suggest that fetal heart rate response to uterine contraction could be used as antepartum test of fetal well being. Later Huddleston and Freeman (1977) have recommended the use of oxytocin challenge test (OCT) for this purpose.

Although procedure is easily reversible but disadvantage of putting intravenous line is there. To avoid difficulties associated with OCT, nipple stimulation has been employed. The basis for the test presumably is that tactile stimulation of the nipple in late pregnancy would stimulate the endogenous release of oxytocin from posterior pituitary which result into uterine contractions appropriate for CST (Lenke *et al*, 1984). With the use of nipple stimulation, many of the objections to CST, would seem to have been overcome. Results obtained with nipple stimulation were as predictable as CST using oxytocin infusion.

Material and Methods

The patients undergoing nipple stimulation stress test were from Lok Nayak

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Jai Prakash and associated G. B. Pant Hospital of New Delhi during the period October 1985 to May 1986. The test was carried on fifty patients admitted in maternity wards in a room close to delivery suite. All patients belonged to high risk categories as listed in Table I.

TABLE I
Distribution of Cases

Diagnosis	No. of Tests	No. of Cases
Total	84	50
PET & H.T.	49	23
Post dated	14	14
IUGR	16	7*
BOH	7	4
D.M.	4	2†
Miscellaneous	4	3

* IUGR: One case had associated H.T.

One case had associated BOH.

† Diabetes: One case had associated PET

The test was carried from 34 weeks onwards whenever a pregnancy was deemed to require a contraction stress test and none of standard contra-indications (previous caesarean section, antepartum haemorrhage or concern about precipitating preterm labour) were present.

This test was carried on "Corometric-112 fetal Monitor" in left lateral position (to avoid aortocaval compression) and baseline fetal heart rate and uterine activity were recorded. Non-stress test was carried out on all patients followed by CST with nipple stimulation.

Blood pressure was recorded every 10 minutes to guard against the development of supine hypotension throughout the test. If uterine activity and repetitive late decelerations were not already present, gravida was instructed to stimulate manually one nipple under cover of clothes with thumb and forefinger; if adequate uterine contractions were not obtained, then both nip-

ples were stimulated. It was carried out till adequate uterine contractions (three in ten minutes) each lasting for 40 to 60 sec. were obtained.

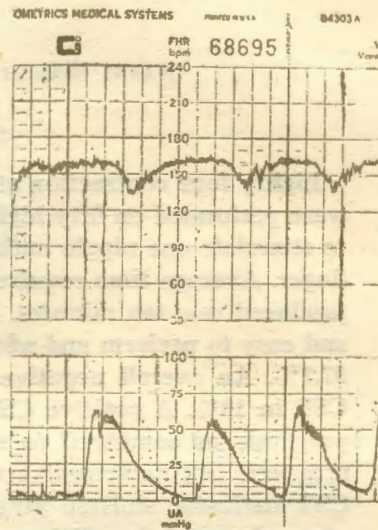


FIG. 1.

The CST test evoked by nipple stimulation were interpreted in the classical manner by Freeman *et al*, 1975. Equivocal (Suspicious, hyperstimulation and unsatisfactory) were repeated within 24 hours. Negative tests were repeated seven days later. Patients with positive test (shown in graph) were further assessed using other methods of fetal well being [Table II(a)].

TABLE II(a)
Results of Eighty Four Tests Performed with Nipple Stimulation

Results	No. of Tests	%
Negative	75	89.3
Positive	6	7.1
Suspicious	1	1.2
*Hyperstimulation	—	—
Unsatisfactory	2	2.4

Outcome in terms of weight of baby at birth, apgar score with follow up till discharge were recorded.

Results and Discussion

During a period of eight months, fifty high risk patients underwent 84 breast stimulation stress tests (Table IIa). Sufficient uterine activity to interpret a CST was obtained in 97.7%. The average time required to perform nipple stimulation stress test was 10 minutes.

Tests interpretations in 50 cases are given in Table IIb. An overall negative CST was found in 88% and positive CST rate was in 10% of cases. Fetal distress in labour in negative CST was present in 6.8% of cases as compared to 80% in positive group and this was found to be statistically highly significant ($P < 0.01$) (Table III).

TABLE II(b)
Results of CST Performed with Nipple Stimulation

Results	No. of cases	%
Negative	44	88
Positive	5	10
Suspicious	1	2

TABLE III
Relation of Fetal Distress in Labour to CST Groups

CST Results	Total	Fetal distress in labour			
		Present		Absent	
		No.	%	No.	%
Negative	44	3	6.8	41	93.2
Positive	5	4	80	1	20
Suspicious	1	1	100	—	—

Negative CST is more reliable indicator of fetal well being as no fetal distress was present in 93.2% cases of negative group as compared to 20% in positive group (Table III). But negative CST does not

guarantee that fetus will not develop late deceleration during labour. This occurred despite a negative antepartum CST, probably because labour presents a greater stress than uterine contraction induced by antepartum testing.

Perinatal morbidity was also found to be high (60%) in positive CST group as compared to negative CST (Table IV). Three infants in positive group were asphyxiated at birth, one of which needed prolonged hospital stay for one month while other two with moderate asphyxia were discharged after two weeks. There was no neonatal death in present series.

TABLE IV
Perinatal Outcome in CST Group

Outcome	Positive		Negative	
	No.	%	No.	%
Total	5	100	44	100
Good	2	40	41	93.1
Morbidity	3	60	3	6.9
Mortality	—	—	—	—

Non reactive NST with positive CST indicates sinister prognosis. Two cases with

positive CST and non-reactive pattern had fetal distress in labour while in negative CST and non reactive NST group, only one out of four cases had fetal distress (Table V).

TABLE V
Relation of CST with NST in Different Groups

CST results	Total	NST Results					
		Reactive		Non-Reactive		Equivocal	
		No.	%	No.	%	No.	%
Positive	5	1	20	2	40	2	40
Negative	44	37	84.1	4	9.1	3	6.8
Suspicious	1	—	—	1	100	—	—

86.7% of patients with negative CST went into labour and had vaginal delivery and perinatal outcome was good in 93.1% while four out of five cases with positive CST required LSCS.

Two cases with unsatisfactory CST, had negative result on repeat testing after 24 hours. One case of diabetes mellitus in which NST was non-reactive and CST was suspicious, test could not be repeated as patient had LSCS in less than 24 hours of performing the test for fetal distress while being induced.

Only one patient showed hyperstimulation response (uterine activity > 90 seconds) but with no late deceleration pattern. Patient delivered vaginally and neonate had no problem.

An accurate evaluation of fetal well being in the antepartum period was essential in the management of high risk pregnancies as this group was expected to contribute to majority of perinatal mortality and morbidity. CST gives better reflection of uteroplacental insufficiency as compared to NST.

With the use of nipple stimulation, many of the objections to the OCT would seem to be overcome. Its advantages over the OCT are that it is more practical, less time consuming besides absence of requirements for an intravenous line.

Contraction stress test by nipple stimulation test was not associated with

preterm labour in this study. A negative nipple stimulation test within seven days of labour is no guarantee that intrapartum distress will not occur. Exaggerated uterine activity was observed in one case but was not associated with any adverse outcome.

A positive CST is less indicative of a poor fetal prognosis as compared to negative CST as an indicator of good prognosis because a false positive rate is higher as compared to false negative rate. Positive CST does not warrant an immediate LSCS but indicates further evaluation for fetal well being, closer supervision and vigorous management so that IUDS, still birth and birth asphyxia can be prevented.

The gestation maturity, the Bishop score at that time and quality of paediatric care available would go a long way in guiding the obstetrician's decision.

References

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