

CORRELATIVE VALUE OF DFMC, NST, CST IN ANTENATAL FETAL MONITORING

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SUMMARY

The ideal test for mass screening of fetal reserve in utero as indicated by our study is DFMC, NST should be reserved only for those cases who experience less than 10 fetal movements/12 hour. Active and hypoactive NST's are associated with good fetal outcome and should not raise undue alarm. All patients with inactive NST should be subjected to CST.

Introduction

There has been a considerable decrease in the perinatal mortality and morbidity in recent time. However, perinatal loss is still quite high in gravidas at risk. Such mothers constitute a dense core of obstetric morbidity and should be put on an effective monitoring system. Presently DFMC, NST and CST are the most widely used such systems. (Rayburn, 1982; Sadovsky and Yaffe, 1973; Pearson and Weaver, 1976; Edinger *et al* 1975; Farahani, *et al* 1976). The present study is aimed at finding out the correlative value and role of these respective tests in antenatal monitoring of high risk cases.

Material and Methods

Eighty nine women with a singleton pregnancy of 32 weeks and onwards were taken up for antenatal monitoring by DFMC, NST and CST. Out of these 33 high risk pregnancy cases formed the

study group whereas 56 women with uncomplicated pregnancy were taken as controls. (Table I). The results of DFMC and NST were correlated with Apgar score of the babies at 1 minute and 5 minutes.

TABLE I
Showing Total Material Collected

Procedure	No. of procedure	No. of cases
DFMC	1,128	33—High risk and
NST	94	56—Normal
CST	19	
Total	1,241	89

DFMC

Daily fetal movement count/12 hour was done according to the method of Sadovsky and Yake (1973).

The specificity, sensitivity and predictive value of DFMC was calculated, using the formula given by Rayburn (1982).

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NST AND CST

Hewlett Packard model 8040 cardiograph was used.

Non-stress test recordings were interpreted according to the classification given by Lee and Drukker (1979). Maximum recording time was 20 minutes. Contraction Stress Test was done and interpreted according to Kllavan, Laver and Boscola (1979).

Observations

1. Daily fetal movement count

The results of daily fetal movement count are shown in Tables II, III and IV. A total of 5.62% patients perceived decreased fetal movements and fetal outcome was poor in 40% of these cases when correlated with apgar score at five minutes.

TABLE II

Results of DFMC in the Present Study

DFMC/ 12 hour	Control	Study	Total
< 10	—	5	5
> 10	56	28	84

TABLE III

Showing Correlation Between DFMC and Apgar Score at 5 Minutes

DFMC	Apgar Score at 5 minutes	
	<7	>7
< 10	2	3

TABLE VI

Showing Correlation of NST, Type of Decelerations, Variability and Apgar Score (5 Mts.)

NST Pattern	Deceleration		Variability	Apgar Score <7 at 5 mts.
	Variable	Late		
Active	6	1	N	1*
Hypoactive	1	—	N	—
Inactive	1	1	D	2

N = Normal. D = Decreased.

* Baby developed surgical emphysema.

TABLE IV

Showing Sensitivity, Predictive Value and Specificity in the Present Study

Sensitivity		Predictive value		Specificity	
No.	%	No.	%	No.	%
25/28	89.28	25/28	89.28	2/5	40

2. Non-stress Test

The results are shown in Tables V and VI. Presence of variable and late deceleration gives poor fetal prognosis especially when associated with decreased variability.

TABLE V

Showing Correlation of Apgar Score (5 Min.) and Non-stress Test

NST Pattern	Control		Study	
	No.	As<7	No.	As<7
Active	42	—	24	1*
Hypoactive	14	—	7	2
Inactive	—	—	2	2
Total	56	—	33	5

3. Contraction Stress Test

There were 19 cases of hypoactive non-reactive NST which were subjected to CST. The results were negative in all the cases. In two cases who had shown inactive non-reactive NST, CST was not performed because there were also evidence

of either variable or late deceleration. The false negative rate was 10.5%.

Discussion

Daily Fetal Movement Count

Maternal perception of fetal movement is the oldest, simple, inexpensive and non-invasive technique of fetal monitoring. All pregnant patients subjectively register 82% of all fetal movements (Rayburn, 1980). A poor fetal outcome in 45% to 81% cases has been observed with diminished maternal perception of fetal movement (Goodlin and Haesslein, 1977; Rayburn, 1982; Leader *et al* 1981). In our study fetal outcome was poor in 40% of inactive fetuses. Our observations on the sensitivity, predictive value and specificity of DFMC are on the lines of Leader *et al* (1981).

Non-stress Test

Non-Stress Test has been accepted as simple and reliable test for predicting fetal well being (Nochimson and Turbeville, 1978; Phelan *et al* 1982; Barrett *et al* 1981). In the present series 2.9% of patients had variable deceleration with normal variability and 3.6% were associated with late deceleration and decreased variability (Table VI). Comparative figures of incidence of variable and late deceleration is shown in Table VIII. We attribute the higher incidence of variable and late deceleration to the fact that both high and low risk cases were included in our study

TABLE VIII
Showing Comparative Incidence of Variable and Late Deceleration

Author	Deceleration	
	Variable	Late
Lee and Drukker (1979)	0.5%	0.3%
Abbot (1984)	1.0%	2.0%
Present series (1984)	2.9%	3.6%

The association of variable deceleration with active or hypoactive NST was found to be insignificant when fetal outcome was taken into account. (Table VI). Also, CST performed in all such cases were negative. It is, therefore concluded that presence of decreased variability or variable deceleration should only be considered as a poor prognostic sign when observed in association with inactive NST.

A negative correlation between DFMC and NST ($r = -0.815$, $p < 0.05$) was observed in our study. This implies that the number of non-reactive cases were more when DFMC was less than 10 per 12 hours. Similar view has been expressed by several workers (Rayburn, 1982; Rayburn and McKeen, 1980; Neldam, 1980).

Contraction Stress Test

CST was performed where NST was hypoactive, non-reactive. It was negative in all cases. The CST had a false negative rate of 10.5% in the present study. A false negative rate of 10% was observed by Evertson *et al* (1978).

TABLE VII

Showing Correlation Between DFMC and NST

DFMC	NST		
	Active	Hypoactive	Inactive
<10	1	2	2
>10	23	6	2

$r = -0.815$ $P < 0.5$

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DISCUSSION

It is important to select the best monitoring technique available when antenatal monitoring is indicated. The choice of technique depends on the clinical situation, the gestational age, and the availability of the technique. The DRMC, NST, and CST are the most commonly used techniques. The DRMC is the most sensitive technique, but it is also the most expensive. The NST is the most specific technique, but it is also the most expensive. The CST is the most specific technique, but it is also the most expensive.

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