

Colour Doppler And Non Stress Test:- Useful Diagnostic Tool For Foetal Surveillance In High Risk Pregnancy



Medical Science

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ABSTRACT

INTRODUCTION:

Antepartum fetal surveillance of high risk pregnancy to obtain fruitful outcome has been the biggest challenge to obstetrician in present era.

OBJECTIVES:-

Aim of the present study is to evaluate the utility of NST and doppler study as a diagnostic method in fetal surveillance and to improve fetal outcome in high risk fetus.

MATERIAL AND METHOD:-

This prospective randomised study was carried out from June 2007 to July 2009 had included 100 high risk patients admitted to the department of obstetric and gynaecology at the tertiary health care centre.

RESULT:-

Pregnancy induced hypertension was the most common (60%) high risk factor in present study followed by oligohydramnios (21%) and postdatism (13%). In the present study 27% patient had abnormal doppler and 45% had non reactive NST.

INTRODUCTION

In present era to get successful outcome in high risk pregnancy like Pregnancy induced hypertension, Diabetes mellitus, post-datism and oligohydramnios is the biggest dilemma for the obstetrician. Improvement in perinatal care in the last two decades has resulted in a dramatic decrease in perinatal mortality and morbidity. These advances include improvement in technological aspect of NICU and better fetal surveillance methods.

Primary purpose of fetal surveillance is to detect fetal hypoxia and acidosis at early stage which are the common causes of fetal mortality and morbidity in the high risk group, so by using this method we can minimize this complication.

Over the last few years there has been an evolution of new information increasing the use of biophysical monitoring method like Contraction stress test, Non stress test, Bio physical profile, Vibro acoustic stimulation test, and fetal movement monitoring, AFI index and more recently computerized fetal heart rate and biophysical assessment is ideal for high risk fetuses.

Doppler is the more recent and noninvasive diagnostic modality for obstetrician.

Doppler identifies fetal compromise earlier than Non stress test. Significant doppler changes occur with reduction in fetal growth at a time when other fetal well being tests are still normal. With combined use of other means of fetal surveillance like Ultrasonography and Non stress test, it is possible to detect both acute and chronic insult of fetus and to provide appropriate intervention for positive outcome.

MATERIAL AND METHOD:

This prospective randomised study has consisting of 100 patients was carried out from June 2007 to July 2009.

Cases were selected out from outdoor and indoor patients in our institute.

High risk patients at near term and who came in labour were included.

Detailed history was taken including age, menstrual history, obstetric history, as well as complaints of patients during admission.

Routine investigations as well as specific investigations like platelet count, renal function test, liver function test, prothrombin time, and plasma fibrinogen were performed when needed.

USG for fetal assessment, liquor adequacy and doppler analysis of umbilical artery, middle cerebral artery, which was carried out by duplex scanner.

Various parameters like SD ratio, RI, PI in umbilical and middle cerebral artery was noted.

NST was done in every patient and NST was repeated according to previous NST.

All the patients were observed for intrapartum signs of fetal hypoxia and obstetric outcome was noted in term of gestational age, mode of delivery, live birth or still birth, birthweight of neonate, APGAR score and NICU admission.

OBSERVATION AND DISCUSSION

The present prospective randomized study was carried out in a general hospital which is a tertiary level referral center having well equipped neonatal intensive care unit (NICU)

100 high risk pregnant patients were studied

In every patients ultrasonography with Doppler study of umbilical artery, middle cerebral artery and NST was carried out and fetomaternal outcome was noted.

TABLE 1
DISTRIBUTION ACCORDING TO AGE AND SE STATUS

1 AGE GROUP(YR)	NO OF PATIENTS
UPTO 20	12
21- 25	42
26-30	38
>30	8
2 OBSTETRIC HISTORY	
PRIMIGRAVIDA	62
MULTIGRAVIDA	38
3 SOCIO-ECONOMIC STATUS	
LOWER	75
MIDDLE	16
HIGHER	9

In the present study more than 60% of patients were primigravida and more than 70% of patients were belonging to lower socioeconomic class.

TABLE 2
NO OF DIFFERENT HIGH RISK PATIENTS:

HIGH RISK	NO OF PATIENTS	NORMAL DOPPLER	ABNORMAL DOPPLER	% OF ABNORMAL DOPPLER
PIH	60	33	27	45
OLIGOHYD AFI<5	21	18	3	14.28
POST DATE	13	12	1	7.6
OTHERS	6	6	0	0

Table shows 60% of patients with PIH and out of all patients 55% had normal Doppler.

In our study 21% patient had oligohydroamnios and out of which 14.2% had abnormal Doppler. Oligohydroamnios is due to some maternal or fetal condition like congenital anomaly and viral infection.

TABLE 3
ASSOCIATION OF PIH AND ABNORMAL DOPPLER.

TYPE OF PIH	NORMAL DOPPLER	ABNORMAL DOPPLER	% OF ABNORMAL DOPPLER
MILD [36]	29	7	29.3
SEVERE [24]	4	20	85

Table shows 83.4% of patients with severe PIH had abnormal Doppler (p<.001).

Out of 20 patients ,10 patients had increased S/D ratio in umbilical artery 7 had reversal of flow and only 3 patients had absent diastolic flow.

TABLE 4
RESULT OF NON STRESS TEST.

HIGH RISK PATIENTS	REACTIVE NST	NON REACTIVE NST	% OF NON REACTIVE NST
N 100	(55)	(45)	
PIH (60)	32	28	46.66%
OLIGOHYDROAMNIOS (21)	10	11	52.38%
POST DATE (13)	8	5	38.46%
OTHERS (6)	5	1	33.3%

Table shows that out of 60 patient of PIH 28 patients had non reactive NST (p.099)

Incase of oligohydroamnios out of 21 patients 11 patients had non reactive NST P(0.045)

Total 45 % of patients in present study had non reactive NST out of which 74% of pregnancies had normal neonatal outcome in form of live newborn.

NST has low sensitivity but high specificity while doppler has both high when both combine values are increased.

TABLE 5.
PREGNANCY OUTCOME

FETAL SURVEILLANCE TEST	MODE OF DELIVERY		FETAL OUTCOME	
	ND (72)	LSCS (28)	HEALTHY BABY(71)	UNHEALTHY BABY(29)
1 NON STRESS TEST				
REACTIVE (55)	47	8	47	8
NON REACTIVE (45)	25	20	24	21
212 DOPPLER				
NORMAL (73)	65	8	69	4
ABNORMAL(27)	7	20	5	22
3 NST AND DOPPLER				
BOTH NORMAL	45	4	47	2
BOTH ABNORMAL	1	20	2	19

Out of 100 patients 72 patients delivered vaginally while 28 patients had undergone cesarean section.

only 20% cesarean was due to abnormal fetal surveillance test, while 8% of cesarean was done due to some other obstetric condition like previous LSCS and severe oligohydroamnios.

71% babies are healthy only 29% require NICU admission.

Out of total 29 NICU admission most of the fetus was given back to mother within 24 hours of admission and 2% babies expired in NICU due to septicemia

CONCLUSION

Doppler has high sensitivity and specificity than NST, but has certain disadvantages like it requires sophisticated instrument, high degree of operational skill and expertisation and it is not available at all centers.

NST has certain advantages like ease of application modest technical requirement, low cost and minimal time required

NST has low sensitivity but in case with normal doppler, sudden abnormal NST indicate acute hypoxia and signal for immediate obstetric intervention.

Both NST and doppler are complementary to each other in fetal surveillance of high risk pregnancy.

Therefore two techniques should be concurrently used rather than making a preference for better fetomaternal outcome in high risk pregnancy.

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