

Role of Admission Test

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Summary

A prospective randomised study was carried out in high and low risk pregnant patients in Queen Mary's Hospital, K.G. Medical College, Lucknow to prove the efficacy of admission test in predicting fetal jeopardy during labour. It was seen during the study that incidence of fetal distress and chances of caesarean delivery done for fetal disorders were higher in abnormal admission test group (47.8% vs. 24%) as compared to reactive admission test group irrespective of high or low risk factor. There was marked difference in number of asphyxiated babies (Apgar score <7 at 5 minutes), 8.7% abnormal admission test group versus 1.6% in reactive admission test group. Neonatal admissions were higher with abnormal admission test ($p=0.008$) and neonatal mortality was also higher with abnormal admission test ($RR=2.8$) as compared to reactive admission test group irrespective of high or low risk factors. Association of abnormal admission test with passage of meconium and oligohydramnios was found to be highly significant ($p<0.0007$ and $p<0.001$ respectively) and showed higher fetal morbidity and mortality.

Introduction

Since intrapartum events account for 20% of still births, 20-40% of cases of cerebral palsy and 10% cases of severe mental retardation, it has been observed that intrapartum fetal hypoxia is one of the potential factors involved in the development of handicaps and perinatal deaths. Goal has been to identify fetus at risk by antepartum and intrapartum fetal monitoring. Fetal movement count mainly depends on individual perception. Intermittent auscultation, by stethoscope needs strict supervision and only baseline heart rate can be measured while other important features like beat to beat variability, acceleration and deceleration are difficult to quantify. Continuous electronic fetal monitoring being an expensive procedure cannot be applied to all patients and it has been seen that intrapartum morbidity and mortality among infants is not uncommon even in low risk patients. So it is necessary to identify the mother who is genuinely "low risk" but develops intrapartum

hypoxia so that proper allocation of available resources, cardiotocographic machines and manpower could be done.

Admission test is one such noninvasive technique by which a short 15-20 minutes external electronic fetal monitoring on admission in early labour can be used as a screening test to identify a subgroup of fetuses who would benefit from more intensive monitoring, while others can be monitored with intermittent auscultation. This test can also detect fetal hypoxia already present at the time of admission, which is not apparent clinically.

Material and method

To prove efficacy of admission test in predicting fetal jeopardy in utero in early labour and its application in improving fetal outcome, this randomised prospective study was carried out in Queen Mary's Hospital. The

George's Medical College, Lucknow. A total of 175 patients were included in the study. Among them 129 patients were having one or more risk factors. All patients included in the study were monitored for 20 minutes on fetal monitor in semilateral position at the time of admission in early labour. Labour room team was kept blind from the outcome of admission test. These patients were followed upto delivery in labour room by intermittent auscultation and important events during labour like development of fetal distress on auscultation, passage of meconium, duration of labour, mode of delivery and fetal outcome were noted in a systematic manner.

In all these patients amniotic fluid index was also determined by ultrasound. Fetal well being was assessed by Apgar score at 5 minutes. Other important points like need for neonatal admission, stay in hospital, perinatal mortality were also noted.

After compiling the observed data and correlating it with admission test outcome, following results were obtained.

Admission test outcome was compared with amniotic fluid index values and it was seen that there were 4 patients who had oligohydramnios (i.e. AFI <5cm), of whom 75% i.e. 3 patients had abnormal NST at the time of admission and all 4 patients developed fetal distress. Three patients had LSCS and one patient had instrumental vaginal delivery. In this group 50% babies had perinatal mortality. It was seen from the study that there were greater cases showing abnormal NST when AFI was <10 cm as compared to cases with AFI > 10 cm ($p < 0.05$).

Presence of fresh meconium in amniotic fluid which has been regarded as sign of fetal hypoxia, showed greater correlation with abnormal admission test ($p < 0.0001$). Out of 21 patients who passed meconium during labour, 62% were from abnormal admission test group. Out of this abnormal admission test patients, 71.4% developed fetal distress during labour. It was seen during the study that in patients with abnormal admission test as well as passage of meconium, the fetal morbidity and

Table I
Distribution of cases developing fetal distress
with respect to Risk Factor and Admission
Test Outcome

Risk Factor	Admission Test Outcome	Cases Dev. Fetal distress		Cases in which no fetal distress detected	
		Number	%	Number	%
High Risk Group (n=129)	Reactive (n=92)	29	31.5	63	68.5
	Abnormal (n=37)	20	54.1	17	45.9
Low Risk Group (n=46)	Reactive (n=37)	7	18.8	30	81.2
	Abnormal (n=9)	2	22.2	7	77.8

Result

When outcome of admission test was compared in relation to development of fetal distress later in labour, it was seen that out of 129 patients who had reactive admission test 36 (27.9%) developed fetal distress while out of 46 patients who had suspicious/non-reactive non-stress test 22 (47.8%) developed fetal distress ($p = 0.013$, sensitivity 38%, PPV 48%, specificity 79%, NPV 72%). When incidence of fetal distress was calculated with respect to risk factor, it was much higher in patients with high risk factor and abnormal NST viz 54.1% as compared to 22.2% in patients without any high risk factor and abnormal NST (Table I).

mortality was higher.

There were more patients delivered by LSCS in abnormal admission test result group as compared to patients with reactive NST.

During present study in patients with reactive non-stress test at admission only 1.6% patients showed Apgar score <7 whereas in cases of abnormal admission test 8.7% patients showed Apgar <7 at 5 minutes ($p < 0.04$). When neonatal admissions were compared in both groups of admission test, it was seen that there were 3.93 times more neonatal admissions in patients with abnormal NST ($p = 0.008$) (Table II)

Table II
Fetal outcome (Viz. Apgar Score at 5 minute, neonatology admissions and perinatal mortality)
in both groups of admission test

Result of Admission test	Babies with Apgar <7 at 5 minutes		Babies admitted to neonatology unit		Perinatal mortality	
	No.	%	No.	%	No.	%
Reactive (n=129)	2	1.6	5	3.9	2	1.6
Abnormal NST (Suspicious and Non reactive (n=46))	4	8.7	7	15.2	2	4.3

Discussion

Patients included in the present study were from high risk as well as low risk group admitted in labour room in early labour. There were 129 patients (73.7%) having reactive admission test and 46 patients (26.3%) showed abnormal (suspicious/non-reactive) admission test.

It was seen during the present study that 59 (45.7%) cesarean sections were done in reactive admission test group and out of this 31 patients i.e. only 24% patients had LSCS done for fetal distress whereas in patients with abnormal admission test 28 patients (60.97) had cesarean deliveries and out of this 22 i.e. 47.8% patients had LSCS for fetal distress during labour (Table III).

Table III
Relationship of Admission Test and mode of delivery

Result of Admission test	Patients delivered by LSCS (For fetal distress + other indications)		LSCS done for fetal distress only	
	No.	%	No.	%
Reactive (n=129)	59	45.7	30	24
Abnormal (n=96)	28	60.9	22	47.8

Ingemarsson et al. (1986) also carried out a study in low risk patients. Study was carried out in over 1000 low risk women and it was seen that 40% patients with omnious admission test developed fetal distress compared to 1.4% with reactive admission test. In the present study there were 46 patients from low risk group. Of these patients 37 (80.4%) showed reactive NST and 9 (19.6%) showed abnormal NST. In the abnormal NST group with low risk 22.2% patients developed fetal distress

compared to reactive NST group with low risk in which 18.8% patients developed fetal distress.

These results suggest that admission test can be used as an important non-invasive method to diagnose fetal compromise present at the time of admission in high as well as low risk patients in early labour. Obstetricians can be more vigilant in these patients either by doing intermittent NST in labour or if facilities are available, putting the patient on continuous internal fetal monitoring for timely intervention. This will decrease the load of continuous internal monitoring in all high risk patients and make the obstetrician more careful even in a patient with low risk but with abnormal admission test.

References

1. Ingemarsson I, Arulkumaran S, Ingemarsson F, Tambyraja RI, Ratnam SS. *Obst. Gyn.* 68: 800, 1986.