FETAL BIOPHYSICAL PROFILE SCORING (BPPS) IN THE MANAGEMENT OF POST DATED PREGNANCY

GUPTA SHASHI ● GUPTA PRADEEP ● TALY, ANJU

SUMMARY

Post dated pregnancy (pregnancy beyond 41 weeks) is associated with increased perinatal morbidity and mortality and maternal morbidity.

Total 180 patients with firmly established gestational age of 41 weeks were studied. Forty-five patients were subject to routine induction of labour which was associated with the highest maternal morbidity (LSCS rate 40%) and significantly high fetal morbidity i.e. 20%. Forty-five patients were subjected to alternate day NST which revealed high false positive rates (63.5%). A fetal BPPS in 90 patients along with maternal assessment was best for detecting fetal risk and immediate intervention or confident conservative management with optimum results for mother and fetus (3.8% perinatal morbidity and 10.3% LSCS rate).

INTRODUCTION

Pregnancy beyond 41 weeks of gestation (287 days) from the first day of last menstrual period is considered post dated and occurs in approximately 10% of pregnancies. Post datism is one of the commonest caues of induction of labour due to increased likelihood of placental insufficiency, fetal distress, oligohydramnios, meconium staining and perinatal morbidity and mortality. Routine induction at 41 weeks does not confer any benefit to the neonate and is associated with a significant increase in LSCS rate (Gibbs et al 1982 and Johnson et al 1986).

Conservative management of post dated pregnancy is not yet adopted widely due to concern about methods of assessing fetal well being. Miyazaki & Miyazaki (1981) reported 8% false negative rate with NST. Phelan et al (1985) reported 71% false

Dept. of Obst. & Gyn., S. M.S. Medical, Jaipur,
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positive rate by measurement of amniotic fluid volume. Johnson by using fetal biophysical profile scoring (BPPS) (Manning et al 1980) for assessing fetus at risk reported only 1.9% fetal morbidity with normal profiles and LSCS rate of only 13 - 15% with conservative management.

The purpose of our study was to compare routine induction at 41 weeks, Non-stress Test (NST) and Fetal Biophysical Profile scoring (BPPS) as a means for assessing the fetus in management of post dated pregnancy and labour and analysing the fetal and maternal outcome.

MATERIAL AND METHOD

This study was conducted in the Mahila Chikitsalaya attached to SMS Medical

Table I
Fetal Biophysical Profile Scoring (Manning)

Biophysical Variable	Normal (Score = 2)	Abnormal (Score=0)
1. FBM (Fetal Breathing Movements)	> 1 episode of > 30 sec. of FBM in 30 minutes.	Absent or no episode of > 30 sec. in 30 minutes.
2. FM (Fetal Movements)	> 3 discrete body/ limb movements in 30 minutes.	< 2 episodes of body/ limb movements in 30 minutes.
3. FT (Fetal Tone)	> 1 episode of active extension with flexion of fetal limbs or trunk opening and closing of hand. Normal tone.	Slow extension with return extension with flexion limb in full extension or absent fetal movements.
4. NST (Non Stress Test)	> 2 episode of acceleration of > 15 bpm and of > 15 sec with fetal movements in 20 minutes.	< 2 episode of FHR acceleration or acceleration of < 15bpm in 20minutes.
5. AFV (Amniotic Fluid Volume)	> 1 pocket of fluid measuring 2 cm in vertical axis.	Either no pocket or largest pocket < 2 cms in vertical axis.

The first 1 to 3 are acute variables and show (CNS) response to hypoxia. NST also is an acute variable. In chronic hypoxia redistribution of blood away from kidneys decrease urinary output leading to decreased amniotic fluid volume.

A source of 8/10 or more was considered normal and 6/10 or below as abnormal. A score of 8/10 with oligohydramnios was also considered abnormal.

College, Jaipur, and the patients with firmly established GA of 41 weeks with single fetus were included in this study. GA was confirmed by early examination and/or ultrasonography.

Group I : 45 Patients subjected to routine induction at 41 weeks.

Group II : 45 patients at 41 weeks subjected to NST on alternate days.

II(a) : 19 Reactive NST - unfavourable cervix - waited for spontaneous labour.

II(b) : 10 Reactive NST - favourable cervix induction of labour.

II(c) : 16 Non-reactive NST - Induction with intrapartum monitoring.

Group III : 90 patients of 41 weeks subjected to BPPS (Manning et al 1980 : Table - I)

A BPPS of 8/10 or more was considered normal and all below 6/10 as abnormal. A score of 6 - 8/10 with oligohydramnios was also considered abnormal.

The interpretation of scores and the management protocol followed by us was as in Table -II. Patients with normal BPPS and unfavourable cervix were tested on alternate days for BPPS and spontaneous labour awaited till 41 weeks, but with ripe cervix, induction of labour was done. Patients with abnormal BPPS were considered for immediate delivery within 24 hours by appropriate route.

The rate of LSCS and perinatal morbidity was calculated for all groups and compared.

Table II
Management Protocol

Test Score	Interpretation	Management
10/10 8/8 (NST not done) 8/10 (NAFV)	No evidence of acute or chronic asphyxia.	Unripe Cx (alternate days) NST till 41 weeks Ripe Cx : induction.
8/10 (ABN AFV) 6/10 N. AFV)	Chronic Asphyxia likely Acute Asphyxia Likely	Considered for immediate delivery within 24 hours by appropriate route.
6/10 (ABN AFV) 3/10 (N-AFV)	Acute/chronic Asphyxia possible Acute Asphyxia possible.	- do -
4/10 (ABN AFV) 2/10 Below	Acute/Chronic Asphyxia very likely.	Immediate delivery by LSCS.

Table III

Groups	Fetal Assessment	Description of Labour	Number
I	None	Routine Induction at 41 weeks	45
IIa	Reactive NST	Spontaneous Labour (Unripe Cervix)	19
IIb	Reactive NST	Induction of Laour (Ripe Cervix)	10
IIc	Non-REactive NST	Induction of Labour (Unripe Cervix)	16
IIIa	Normal BPPS	Spontaneous Labour (Unripe Cervix)	48
IIIB	Induction BPPS	Induction of Labour (Ripe Cervix)	30
IIIc	Abnormal BPPS	Delivered for Fetal Indications.	12

Table IV

PERINATAL MORBIDITY		I (45)	IIa (19)	IIb (10)	IIc (16)	IIIa (48)	IIIb (30)	IIIc (12)
LSCS FOR FETAL DISTRESS	No.	8	1	1	4	0	2	6
	(%)	17.7	5.3	10.0	25.0	0.0	6.70	50.0
5 MINUTE APGAR SCORE < 6	No.	1	0	1	1	1	0	2
	(%)	2.2	0.0	10.0	6.2	2.08	0.00	16.7 33%
MECONIUM ASPIRATION	No.	0	1	0	1	0	0	4
	(%)	0.0	5.3 (False + ve 13.8%)	0.0	6.2 (False +ve 63.5%)	0.0 (PNM 3.9%)	0.0	33.33 (PNM 100%)

Table V

	AMNIOTIC FLUID SCORE	
	2	0
LSCS FOR FETAL DISTRESS	2	4
5' APGAR SCORE <	0	1
MECONIUM ASPIRATION	1	2

Table VI

Groups	LSCS for Fetal Distress No. %	LSCS for Maternal Indication No.. %	Total No. of Lscs No. %	
I (45)	8 17.7	10 22.2	18 40.00	
IIa (19)	1 5.3	3 15.8	4 21.05	20.7%
IIb (10)	1 10.0	1 10.0	2 20.00	
IIIa (48)	0 0.0	6 12.5	6 12.05	10.3%
IIIb (30)	2 6.7	0 0.0	2 6.70	

Observations and results are as given in Tables III, IV, V and VI.

DISCUSSION.

Table III shows the distribution of cases in various groups.

Table IV - The perinatal morbidity differs significantly in different groups. In group-I (Routine Induction) LSCS for fetal distress was performed on 17.7% cases, but there was no increase in frequency of low Apgar of meconium aspiration.

In group IIa and IIb (Routine NST) the total perinatal morbidity was 4 out of 29.i.e. 13.8% (False routine rate).

In group IIc (Not-reactive NST) LSCS

for fetal distress was performed in 4 out of 16 i.e. 25% of cases with a total perinatal morbidity of 37.5% (a false positive of 63.5%). Miyazaki & Miyazaki 1979) reported more than 75% false positive rate with NST. In group III a normal BPPS and spontaneous labour was associated with only 2.08% fetal morbidity and no LSCS for fetal distress. In group IIIb there was 6.7% fetal morbidity. The total perinatal morbidity with normal BPPS being only 3.9% (3 out of 78). In group IIIc abnormal BPPS was associated with 100% fetal morbidity (False positive rate = 0). Patients of this group accounted for 33% of the total low Apgar scores in our study and 65% of serious meconium aspiration requiring admission to neonatal intensive care unit.

Table-V shows the relation of perinatal morbidity with the amniotic fluid volume (AFM) in cases of abnormal BPPS. With AF score (the largest AF pocket less than 1 cm in vertical diameter, 4 patients required LSCS for fetal distress, one had low Apgar score and 2 had serious meconium aspiration. As AF score increased, both maternal and fetal morbidity decreased. Thus, oligohydramnios is a very important parameter for fetus at risk.

The rate LSCS in various groups is indicated in Table-VI. It is significantly high : 40% in patients undergoing routine induction, where 22.2% were done for maternal indications like non-progression of labour CPD, or cervical dystocia. The total number of LSCS in patients with reactive NST (Sub-groups IIa and IIb) were 6 out of 29 i.e. 20.7% only, and still less i.e. 10.3% in cases with normal BPPS (sub-groups IIIa and IIIb).

We therefore see that routine induction is associated with high maternal morbidity. Only NST is associated with high false positive rate. Minimal perinatal morbidity and maternal morbidity were observed when biophysical profile scoring was used for fetal assessment and proper clinical assessment and judgement of the mother was done.

CONCLUSION.

These results are when the BPPS was performed ideally and if in 30 minutes proper movements were not obtained the time was extended to 45 minutes, and repeated after 6 to 8 hours to avoid the sleep cycle; otherwise it might lead to false results. Moreover emphasis should be on the clinical situation while interpreting the score and advising management. WE HAVE TO TREAT THE PATIENT NOT THE TEST. To conclude a properly performed and interpreted BPPS alongwith clinical judgment has emerged out the best method for fetal risk assessment and managing post dated pregnancy and planning the time and type of induction with optimum maternal and fetal outcome.

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