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MODIFIED BIOPHYSICAL PROFILE IN HIGH RISK PREGNANCY AND ITS FETAL OUTCOME

Obstetrics & Gynaecology

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ABSTRACT

Background: High risk pregnancies are at increased risk of maternal and neonatal morbidity and mortality. Modified biophysical profile (MBPP) is one of the best method used in antepartum fetal surveillance which comprises of Non stress test (NST) and Amniotic fluid index (AFI). Our main aim is to evaluate the efficacy of modified biophysical profile in predicting perinatal outcome in high risk pregnancy & to prevent perinatal morbidity & mortality by intervention done in time. **Methods:** A prospective cohort study was conducted in our hospital from February 2021 to January 2022. In this study 200 high risk pregnant women with term pregnancy, attending the antenatal outpatient clinic or admitted in the ward were evaluated with the modified biophysical profile consisting of NST recording for 20 minutes, followed by ultrasound assessment of amniotic fluid volume, using four quadrant technique. **Results:** Among 200 high risk pregnant women, Modified biophysical profile in high risk pregnancy showed amniotic fluid index < 5 in 4.5% cases, 26 % cases had AFI 6 to 8 and 69.5 % cases had AFI 8 to 24 ; CTG showed 23 % cases were found to have non-reactive & 77% cases were reactive. When AFI & CTG was combined, non-reactive CTG is more among cases with AFI < 5 and it was statistically significant (P Value =0.05). The rate of LSCS, Neonatal resuscitation and Admission was increased when there was abnormal MBPP. **Conclusion:** Modified biophysical profile is the best method for antepartum fetal surveillance. It can be used to predict perinatal outcome and provide timely intervention in high risk pregnancies.

KEYWORDS

Modified Biophysical profile, CTG, AFI, High risk Pregnancy, Perinatal outcome

INTRODUCTION

As the technology improves the antepartum fetal surveillance has gone up. Many options are available for fetal surveillance. But modified biophysical profile is one of the best method used in fetal surveillance[1]. It includes two parameters non stress test and amniotic fluid index . The acute fetal hypoxia is detected by non stress test & chronic fetal problems detected by AFI. Modified biophysical profile test is simple and it does not need special skills and it is also reproducible. There is minimal chance of interobserver error.

The ultrasonography helps in assessing the amniotic fluid volume in antenatal patient as it is noninvasive & very easy to handle. The amniotic fluid index is an integral part of modified biophysical profile in assessing the fetal surveillance[2]. The non stress test is a method of fetal heart rate monitoring and helps in identifying fetus at distress in utero[2]. Thus modified biophysical profile helps in preventing perinatal mortality and morbidity[3].

The aims of this study is to evaluate efficacy of modified biophysical profile in predicting perinatal outcome in high risk pregnancy & preventing the perinatal morbidities & mortality by intervention done in time.

MATERIAL AND METHODS

A prospective cohort study was conducted in our hospital from February 2021 to January 2022. 200 high risk pregnant women with term pregnancy, attending the antenatal outpatient clinic or admitted in the ward , met the inclusion criteria and after obtaining informed consent were included in this study . Inclusion Criteria in our study all high risk term pregnancies, Last antenatal visit within 7 days of delivery. Exclusion Criteria : Early pregnancy, Twin pregnancy, Term pregnancy without any high risk factors, Preterm pregnancy . Detailed history, General examination ,Systemic examination and Obstetric examination was carried out.

Routine investigations urine routine, Haemoglobin, Blood grouping and Rh typing, Random blood sugar level, BT,CT were done. Ultrasonogram was done and documented for AFI. On admission NST is done for all high risk cases admitted during term pregnancy. If NST found reactive, then further management is done according to protocol and if non reactive with oligohydramnios Emergency LSCS proceeded (not if patients is in active labour who will deliver immediately).

If patient is in labour (ie less than 3 cm in primigravida and less than 4 cm in multigravida are included in study), oxytocin drip started. Women if not in labour Bishops scoring done . Start oxytocin if cervix is favourable. Induce with Dinoprostone gel in case of unfavourable cervix .Reassess the Bishops score after 6 to 8 hrs of instillation. If in labour, start oxytocin drip. If not in labour watch for another 6 to 8 hrs .Case will be taken for emergency LSCS if no progress. All high risk cases will be monitored by NST in labour. Any signs of fetal distress emergency LSCS done. After 3 centimeter dilatation of the cervical os in primigravida and 4 cms dilatation in multigravida ARM done and will be classified as clear and meconium stained liquor. Cases with meconium stained liquor with fetal distress will be taken for emergency LSCS and also for maternal indication taken up for LSCS. All new borns will be attended by Pediatrician. Various outcome measures recorded are induced vs spontaneous labour, nature of amniotic fluid, FHR tracings, mode of delivery, indication for caesarean section or instrumental delivery, APGAR score at 1 minutes and 5 minutes, birth weight, admission to neonatal ward, perinatal morbidity and mortality.

RESULTS :

In our study among 200 high risk cases, the most common were pregnancy induced hypertension, Postdated pregnancy, gestational Diabetes mellitus, Bad Obstetric History and Anaemia (table 1).

Modified biophysical profile in high risk cases, Amniotic fluid index were 9 cases of oligohydramnios with AFI <5 (5 %), 52 (25 %)cases with AFI 6 to 8 and remaining 139 cases(70%) with AFI 8 to 24 (table 2). Non stress test (NST) was reactive in77% of cases and non-reactive in 23% of cases (table 3).Mode of delivery in non- reactive NST 60 % of cases were LSCS , 20 % cases were Forceps delivery and 20% cases Normal vaginal delivery whereas in reactive NST 70% cases were Normal vaginal delivery and 30% of cases were LSCS. Mode of delivery in AFI, 9 (100 %) cases with <5 AFI were LSCS.

Among 154 reactive NST cases , 76 % , 22% , 2% cases were with AFI 8 to 24, 6 to 8 and less than 5 respectively, whereas in non-reactive NST 48%, 39% and 13% cases were with AFI 8 to 24 , 6 to 8 and < 5.Thus NST and AFI has significant relationship with P value <0.05 (table 4).

Apgar score at 1 min and 5 min in relationship with NST and AFI were significant as shown in the table 5 and 6. 30 % of newborn were admitted in NICU and 70 % were under observation as shown in table 7.

Modified biophysical profile test done for 200 high risk cases. If CTG test done as a single predictor then the sensitivity is 52%, specificity is 82.6%.AFI alone taken as predictor of fetal outcome sensitivity is only 10% & specificity is 96%. The negative predictive value is 84%. When the AFI & NST (modified biophysical profile) were combined then the sensitivity was improved to 89.2% & the specificity was 67.1%.

DISCUSSION:

The MBPP is a well-established method for antepartum fetal well-being evaluation[1]. It can be effectively used for antepartum fetal surveillance to detect compromised fetus at an early stage. My study findings were similar to the studies done by Eden et al[4] ,Donald et al[5], Matsura et al[6], and Arias et al[7].

In Archana et al[8], Jha S et al [9], Maryam Asgharnia et al [10]studies correlate with our study, sensitivity of modified B.P.P test (Diagnostic accuracy) is improved in modified B.P.P. (79.5 as compared to 53.5 for NST and 60.5 for AFI) P.P.V. (Diagnostic power) is also improved in 85.83% as compared to 17.6% for NST and 26.16% for AFI as we have selected only high risk pregnancies.

Many observational studies and randomized studies were on going in which continuous NST monitoring might not prevent the cerebral palsy but it reduces the risk of intrapartum fetal death from fetal hypoxia [11,12]. In my study total LSCS rate was not reduced by modified biophysical profile. Modified biophysical profile help in wait for spontaneous labour & also help to induce the high risk case for termination. It helps to identify the set of patients among high risk mothers to whom we can wait for spontaneous labour.

The normal MBPP gives reassurance that the fetal status is good with good perinatal outcome. At the same time, abnormal MBPP indicates that the fetus may be compromised. Thus, MBPP can be used as a primary antepartum fetal surveillance test to predict perinatal outcome and provide timely intervention in high risk pregnancies.

CONCLUSION :

Modified biophysical profile is the best method for antepartum fetal surveillance. It can be used to predict perinatal outcome and provide timely intervention in high risk pregnancies

Table :1 High risk pregnancies

HIGH RISK CASES	NOs	Percent
Anemia	17	8.5
APH	4	2.0
BOH	14	7.0
Fever	2	1.0
GDM	18	9.0
PIH	43	21.5
HD	10	5.0
IUGR	12	6.0
Jaundice	4	2.0
MP	2	1.0
Post Dated	20	10.0
Prev. LSCS	13	6.5
Prom	11	5.5
RH Negative	16	8.0
Short Primi	14	7.0
Total	200	100.0

Table 2: Amniotic fluid index Distribution

AFI	NOs	Percentage
<5	9	5.0
6 to 8	52	25.0
8 to 24	139	70.0
Total	200	100.0

Table 3 : NST Distribution

NST	Frequency	Percent
REACTIVE	154	77.0
NON REACTIVE	46	23.0
Total	200	100.0

Table 4: Relationship between NST and AFI

AFI	NST						Statistical inference
	R		NR		Total		
	N	%	n	%	n	%	X2=17.689 Df=2
<5	3	2%	6	13%	9	4.5%	
6 to 8	34	22%	18	39%	52	26.0%	000<0.05
8 to 24	117	76.0%	22	48%	139	69.5%	
Total	154	100.0%	46	100.0%	200	100.0%	Significant

Table 5 : Comparison of Apgar at 1 & 5 min with NST

APGAR 1 min & 5 min	CTG						Statistical inference
	R		NR		Total		
	n	%	n	%	n	%	
<7	21	13.6%	25	54.3%	46	23.0%	X2=33.148
>7	133	86.4%	21	45.7%	154	77.0%	Df=1
Total	154	100.0%	46	100.0%	200	100.0%	.000<0.05 Significant

Table : 6 Comparison of Apgar at 1 and 5 min with AFI

APGAR 1min & 5 min	AFI								Statistical inference
	<5		6 to 8		8 to 24		Total		
	n	%	n	%	N	%	n	%	
<7	3	33.3%	19	36.5%	24	17.3%	46	23.0 %	X2=8.505
>7	6	66.7%	33	63.5%	115	82.7%	154	77.0 %	Df=2
Total	9	100.0 %	52	100.0 %	139	100.0 %	200	100. 0%	.014<0.05 Significant

Table 7 : NICU Admission

Particulars	Frequency	Percent
ADMISSION	61	30
OBSERVATION	139	70
Total	200	100.0

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