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RESEARCH ARTICLE

ROLE OF MODIFIED BIOPHYSICAL PROFILE IN PREDICTING PERINATAL OUTCOME IN HIGH RISK PREGNANCY

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Abstract

Background: In order to achieve the target of having a healthy mother and healthybaby there is a need to identify pregnant woman with high risk factors.Ante natal foetal monitoring is aimed at identifying foetus that are at high risk of suffering from intrauterine hypoxia.

Aims and Objectives: To evaluate the role of modified biophysical profile in predicting perinatal outcome in high risk pregnant women

Material and methods: This is a hospital based observational study in the department of Obstetrics and Gynaecology , Victoria Government Hospital , Visakhapatnam, from January 2022 to May 2022.A total of 96 high risk pregnant women were included in this study. Inclusion criteria was ;Singleton pregnancy ,risk factors like[pre eclampsia,gestational hypertension,diabetes mellitus,anemia,past dates,post cesarian section.breech,bad obstetric history and pre term,Exclusion criteria was multifetal gestation,intrauterine death,fetal anomalies. Detailed history was taken and relavent investigations were sent.

Results: 16.9% of cases had meconium stained liquor (normal CTG and AFI), 36% with meconium stained liquor had normal AFI but abnormal CTG, 40% with meconium stained liquor had abnormal AFI but normal CTG, 50% with meconium stained liquor had abnormal AFI and abnormal CTG 0% of babies had perinatal death when AFI and CTG was normal, 100% of babies had perinatal death when AFI and CTG was abnormal

Conclusion: Modified bio physical profile is a easy ,time saving and cost effective procedure and can used as a test of antepartum fetal surveillance in order to predict perinatal outcome in high risk pregnancy.

Introduction:-

Various maternal complications such as preeclampsia, eclampsia, anemia, oligohydramnios etc. are the major causes for perinatal loss. Such high-risk pregnancies need to be identified so that appropriate surveillance and timely interventions can be employed and thus bring down the rate of perinatal morbidity and mortality [1].In order to achieve the target of having a healthy mother and healthybaby there is a need to identify pregnant woman with high risk factors.Ante natal foetal monitoring is aimed at identifying foetus who are at high risk of suffering from intrauterine hypoxia.

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Modified Bio physical profile [MBPP] is one such method used for evaluation of foetalwell being in high risk pregnant women. Also, MBPP is considered to be as effective as complete biophysical profile [2]. Modified biophysical profile (MBPP) combines 2 components of BPP that is amniotic fluid volume and non-stress test. [3]

The ultrasound component of BPP [Biophysical profile] requires 30 minutes to score different components which are quite difficult to manage in tertiary care hospitals. Modified biophysical profile on the other hand measures amniotic fluid volume which can be done in few minutes. There is still inadequate evidence to recommend MBPP as a fetal surveillance tool. [4]

Material And Methods:-

This is a hospital based observational study in the department of Obstetrics and Gynaecology , Victoria Government Hospital , Visakhapatnam, from January 2022 to May 2022.A total of 96 high risk pregnant women were included in this study. Inclusion criteria was ;Singleton pregnancy ,risk factors like[pre eclampsia,gestational hypertension,diabetes mellitus,anemia,CPD,past dates,post c section.breech,bad obstetric history and pre term,Exclusion criteria was multifetal gestation,intrauterine death,fetal anomalies. Detailed history was taken and relavent investigations were sent.

Modified biophysical profile was performed with in 7 days of delivery. Depending upon the previous result it is repeated weekly and bi weekly. •Management is individualized depending on patients' gestational age, risk factors and MBPP result.
Pregnancy outcome was assessed by:
•Meconium stained liquor
•NICU admission
•Low apgar< 8
•Low birth weight
•Perinatal mortality
Statistical analysis was done using SPSS Version 22

Results:-

Table 1:- Distribution of subjects with risk factors-

HIGH RISK FACTORS	NO OF PATIENTS	PERCENTAGE
Post Cesarian section	32	32.2%
Hypertension	23	24%
Gestational diabetes mellitus	16	16.6%
Past dates	14	14.5%
Both GDMand HTN	4	4%
Breech	5	5.2%
Preterm	6	6.25%
PROM	8	8.33%
Bad obstetrics history	4	4.1%
Cephalopelvic disproportion	7	7.29%
Anaemia	3	3.1%

Some patients had more than one risk factor. Post cesarian section was the commonest risk factor with 32 cases (32.2%) [Table 1]

Table 2:- No Of Babies With MSL.

MODIFIED BPP	NO OF BABIES WITH MSL	PERCENTAGE
NORMAL CTG AND AFI	9 OUT OF 53	16.9%
NORMAL AFI AND ABNORMAL CTG	9 OUT OF 25	36%
NORMAL CTGAND ABNORMAL AFI	6 OUT OF 15	40%
BOTH CTGAND AFI ABNORMAL	1 OUT OF 2	50%

16.9% of cases had MSL (normal CTG and AFI), 36% with MSL had normal AFI but abnormal CTG, 40% with MSL had abnormal AFI but normal CTG, 50% with MSL had abnormal AFI and abnormal CTG [Table 2]

Table 3:- No Of Babies Born With Low APGAR.

MODIFIED BPP	NO OF BABIES BORN WITH LOW APGAR	PERCENTAGE
NORMAL CTGAND AFI	0 OUT OF 53	0
NORMAL AFI AND ABNORMAL CTG	5 OUT OF 25	20%
NORMAL CTG AND ABNORMAL AFI	3 OUT OF 15	20%
BOTH CTGAND AFI ABNORMAL	2 OUT OF 2	100%

0% of babies had low apgar when AFI and CTG was normal, 20% of babies had low apgar when AFI was normal but CTG was abnormal, 20% of babies had low apgar when AFI was abnormal but CTG was normal, 100% of babies had low apgar when AFI and CTG was abnormal[Table 3]

Table 4:- NICU Admissions.

MODIFIED BPP	NICU ADMISSIONS	PERCENTAGE
NORMAL CTGAND AFI	4 OUT OF 53	7.5%
NORMAL AFI AND ABNORMAL CTG	5 OUT OF 25	20%
NORMAL CTGAND ABNORMAL AFI	4 OUT OF 15	7.5%
BOTH CTGAND AFI ABNORMAL	2 OUT OF 2	100%

7.5% of babies had NICU admission when AFI and CTG was normal, 20% of babies had NICU admission when AFI was normal but CTG was abnormal, 7.5% of babies had NICU admission when AFI was abnormal but CTG was normal, 100% of babies had NICU admission when AFI and CTG was abnormal[Table 4]

Table 5:- Perinatal Death.

MODIFIED BPP	PERINATAL DEATH	PERCENTAGE
NORMAL CTGAND AFI	0 OUT OF 53	0%
NORMAL AFI AND ABNORMAL CTG	2 OUT OF 25	8%
NORMAL CTGAND ABNORMAL AFI	0 OUT OF 15	0%
BOTH CTG AND AFI ABNORMAL	2 OUT OF 2	100%

0% of babies had perinatal death when AFI and CTG was normal, 100% of babies had perinatal death when AFI and CTG was abnormal [Table 5]

Abnormal CTG was associated with Meconium-stained liquor and was statistically significant (P value .001 .X^2=12.01)

Abnormal CTG was associated with more NICU admissions in infants and it was statistically significant (p=0.0108 X^2= 3.443)

HTN was associated with decreased AFI but it was statistically not significant (p = 0.161) X^2= 3.625

Decreased AFI was not associated with low birth weight babies and it was statistically not significant (p = 0.078). X^2= 5.099

Decreased AFI was associated with low APGAR after birth and it was statistically significant (p = 0.005). X^2= 10.538

Discussion:-

BPP has been proven as an effective surveillance tool in high-risk pregnancies as opposed to low-risk pregnancies [5]

In the study by Nalamuri PR et al [6], Meconium stained liquor was seen in 20 (30.3%) Abnormal NST patients, 13 (24.1%) Low AFI and 22 (31%) abnormal BPP patients. Amongst the normal NST patients, meconium stained liquor was seen in 4 (5.1%) patients, in 11 (12.1%) normal AFI patients and 2 (2.7%) normal BPP patients. A low APGAR score was observed in 24 (36.4%) Abnormal NST patients, 4 (5.1%), normal NST patients, 18 (33.3%) low AFI, 10 (11%) normal AFI, 26 (36.6%) abnormal BPP and 2 (2.7%) normal BPP patients. 46 babies were admitted to the neonatal unit for further monitoring out of which, 40 (60.6%), 32 (40.5%) and 41 (57.7%) has abnormal NST, low AFI and abnormal BPP respectively.

In the study by Santhosh Jha et al [7], Of 172 cases, there were 97 (56.4%) cases in normal modified biophysical profile and remaining 75 (43.6%) in abnormal modified biophysical profile group. The rate of cesarean section increased when there was abnormal modified biophysical profile. Neonatal resuscitation and admission was increased in abnormal modified biophysical profile.

In the study by Zahid N et al [8] the mean age of pregnant women was 25.32±5.25 years and mean gestational age were 36.02±0.85 weeks. Non-stress test and amniotic fluid index was normal in 70 (63.64%) patients and was abnormal in 13 (11.82%) women. Normal non-stress test and abnormal amniotic fluid index was 10 (9.10%) in women while abnormal nonstress test and normal amniotic fluid index was 17 (15.45%) in women. Meconium stained liquor found in 29 (26.36%), Apgar score

Table 6:- Comparison of last MBPP results with other study groups.

TEST RESULT	Soumya et al[9]	PRESENT STUDY
REACTIVE NST	68.57%	70.8%
AFI >5	91.43%	80.3%

Table 7:- Comparison of last MBPPand MSL results with other study groups.

STUDIES	NO OF PATIENTS	P VALUE
Soumya et al	19 (27.14%)	0.000 HS
S Jha Dangal G. et al	9(26%)	<0.05
Present study	15 (15.6)%	.001 SIGNIFICANT

Table 8:- Comparison of 5 minute APGAR score of <7 in other studies:

STUDIES	NO OF PATIENTS	P VALUE
Soumya et al	13(18.57%)	0.000 HS
S Jha Dangal et al	5 (15%)	<0.05
Present study	6(6.3%)	0.005

Conclusion:-

Modified bio physical profile is a easy ,time saving and cost effective procedure and can used as a test of antepartum fetal surveillance in order to predict perinatal outcome in high risk pregnancy.A normal modified BPP gives a reassurance that fetal condition is good , where as an abnormal modified BPPinfers that baby is compromised. It can also be employed in low resource settings.

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