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Foetal Assessment Based on Biophysical Profile Scoring

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Abstract **Original Research Article**

***Introduction*:** Accurate prenatal recognition of acquired and congenital disease states that affect foetal function and structure must be first critical step in reducing or preventing perinatal morbidity and mortality. Antepartum foetal heart rate tests based on acceleration of rate with foetal movement (non-stress test or NST) or the presence or absence of periodic decelerations with uterine contractions (contraction stress test or CST) have proved to be useful methods for antepartum assessment of foetal risk. ***Objective*:** To assess the foetal assessment based on biophysical profile scoring. ***Methods*:** A prospective design was considered suitable for the present study was conducted in the Department of Obstetrics & Gynecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka during the period from July 2006 to December 2006. Sample Based on enrolment criteria, a total of 60 patients were taken consecutively from study population to conduct the study. High risk pregnant women attending at BSMMU to have their babies checked/delivered were the study population. ***Results*:** Out of 53 subjects participated in the study, 5.7% were below 20 years of age, 18.9% between 20-25 years, 28.3% between 25-30 years, another 28.3% between 30-35 years and 18.9% 35 or above 35 years of age. The mean age of the subjects was 28.5 ± 5.5 years and the lowest and highest ages ranged from 19 to 39 years. shows that 35.8% of the subjects were primipara and 32.1% multipara. The rest one-third (32.1%) of the subjects did not have any experience of having live-birth. demonstrates that 70% of the subjects were primigravida and the rest multigravida. Distribution of the subjects by gestational age shows that 71.7% lie between 37 - 42 weeks of gestation at the time of BPP. The rest 28.3% had gestational age below 37 weeks. Clinical presentation of the subjects at the time of BPP shows that predominant sign was anaemia (75.5%) followed by oedema (62.3%). prteinuria (50.9%), diastolic blood pressure (34%), systolic blood pressure (30.2%) and diabetes (20.8%). Normal AFV was found (presence of a pocket of amniotic fluid that measures at least 2 cms in depth) in 50.9% of the cases. Total BPP score 8 or more and 6 or less were observed in 52.8% and 47.2% of the cases respectively. Birth weight of the subjects show that 62.3% of the subjects were born with normal birth weight (2500 gm or more), while the rest with low birth weight (< 2500 gm). Other perinatal complications were complications neonatal; seizure (11.3%) and hypoxic encephalopathy (11.3%). Two babies (3.8%) were still-born and 6(11.3%) died within 7 days of birth. Maternal age and gravidity were not found to be associated with BPP ($p>0.05$). Neonatal resuscitation needed was also much less in cases with BPP ≥8 (14.3%) than that in cases having BPP ≤ 6 (44%) ($p=0.017$). 45.9% More than half (52%) of the babies with BPP ≤ 6 had APGAR 7 or <7 at 1 minute of birth as opposed only 17.9% of those with BPP ≥ 8 ($p = 0.009$). APGAR at 5 minute of birth was also considerably higher in babies with BPP ≤ 6 (24%) than those with BPP ≥ 8 ($p = 0.092$). NICU admission was also significantly less in babies with higher BPP score compared those with lower BBP score ($p = 0.017$). ***Conclusion*:** They concluded that not all abnormal biophysical profiles scores are equal. The serious consequences may ensue from improper management decision based on the total BPP score rather than on careful evaluation of the individual test component.

Keywords: Outcome, Foetal Assessment, Biophysical Profile, Scoring.

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INTRODUCTION

Accurate prenatal recognition of acquired and congenital disease states that affect foetal function and structure must be first critical step in reducing or preventing perinatal morbidity and mortality. Antepartum foetal heart rate tests based on acceleration of rate with foetal movement (non-stress test or NST) or the presence or absence of periodic decelerations with uterine contractions (contraction stress test or CST)

have proved to be useful methods for antepartum assessment of foetal risk [1,2]. With either test the, the false negative rate is low but the false [2,3], positive rate is high [4,5]. Thus these tests are most reliable in identifying the normal foetus. The development of dynamic ultrasound imaging methods or real time B-mode ultrasound has largely overcome these difficulties & allowed simultaneous assessment of a wide range of foetal structural and functional characteristics. Several studies have noted an improvement in perinatal mortality when five discrete foetal biophysical indices were observed and combined (foetal biophysical profile score) for perinatal [3-5], management decisions [3- 5]. Now considerable information concerning fetal condition can be obtained from a single examination [6]. The biophysical profile (BPP) is an excellent test for evaluation of fetal well-being. It entails the observation by ultrasound of fetal breathing movement, fetal body movement, fetal tone, amniotic fluid volume (AFV) and fetal heart rate (FHR). Thus it is not surprising that the BPP has gained popularity & is used with increasing frequency all over the world [7]. The main problem with the BPP is the structure of the test in which each of the five criterion is assigned a score of either '0' or '2' points, despite the possibility that each of these variables may have different importance in assessing the fetal situation [8]. The BPP variables become functional at different gestational age. Fetal tone & movement appear between 7 & 9 weeks & require activity of the brain cortex. Fetal breathing movements begin at 20 to 21 weeks and depend on centre in the ventral surface of the fourth ventricles. FHR reactivity appears between 28 & 30 weeks & probably stems from function of the posterior hypothalamus & nucleus in the upper medulla. This has been lessened by a recent definition made by the investigators who originally developed this test: 'A normal BPP' corresponds to a score 8 or greater but this value must include a normal amniotic fluid volume. The new definition of a normal BPP will prevent the potential error associated with a score of '8' when only two points are taken off in case of markedly decreased amniotic fluid volume. A fetus with a BPP of '4' consist of two points for reactive non-stress test & two points because of normal amniotic fluid volume is most likely perfectly normal. Therefore, interpretation of the biophysical profile results should be made by separate analysis of each of the individual component of the test. Another problem with the BPP is that alteration in some of the test criterion occurs relatively late in the process of fetal asphyxia. Decreased foetal movement & decreased foetal tone are found only when the foetal condition is severe & by the time of discovery, the value of intervention is sub-optimal. Other problem with the BPP are the difficulties in evaluating foetal tone, the definition of decreased amniotic fluid volume & whether prolonging the test time to increase the possibilities of an adequate foetal response is permissible [9].

MATERIALS AND METHODS

Place and Duration of Study

The study was conducted in the Department of Obstetrics & Gynecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka during the period from July 2006 to December 2006.

Design of Study: A prospective design was considered suitable for the present study.

Study Population

High risk pregnant women attending at BSMMU to have their babies checked/delivered were the study population.

Sample Size and Sampling Procedure

Based on enrolment criteria, a total of 60 patients were taken consecutively from study population to conduct the study.

Selection Criteria:

The selection criteria employed to select the patients are defined below:

Inclusion Criteria for the Study Population:

- Mal-presentations.
- Multiple pregnancies.
- Mentally retarded or spastic child resulting from previous delivery.
- Previous perinatal death without any known cause.
- Previous severe fetal distress with Apgar score 3 or less.
- Pregnancy with hypertension, diabetes, polyhydramnios. Antepartum - haemorrhage and any other medical diseases, viz. heart disease, hypothyroidism and systemic lupus erythematosus (SLE) etc.
- Intrauterine growth retardation (IUGR).
- Premature rupture of membranes.
- Previous low segment caesarean section.
- Postdated (gestational age > 42 weeks).
- Known Rh incompatibility.
- Decreased foetal movement.

Exclusion Criteria:

- Patient admitted to labour ward either with spontaneous or induced labour having singleton uncomplicated pregnancy.
- Gestational age between 37 and 42 weeks without any high risk conditions or diseases.

Obtaining Consent from the Patients

Permission was taken from the authority of BSMMU. Written consent was taken from the selected group of patients. A copy of the consent from is attached in the (Appendix I).

Method of Testing: Non-Stress Test (NST)

The NST was performed with the use of a Sonicaid team CTG machine.

Procedure

Patient was placed in semi-recumbent position with slight left lateral tilt. Blood pressure was measured at the initiation of the test and every 10 minutes thereafter.

After palpation of abdomen, position of the foetus was confirmed and the position of transducer on the abdomen over the fetal side was selected. Aquasonic coupling medium was applied liberally to the abdomen, over the fetal side to the face of transducer. Transducer was moved slowly until the characteristic sound of the foetal heart was heard. The stretch belt was placed around the abdomen and attached to the other side of the buckle. The transducer was clipped through one of the positioning hole on the buckle so that it retained at the optimal foetal heart signal position. A second stretch belt was placed around the abdomen but coupling gel was not used. Second transducer signals uterine contraction in percentage.

Having fetal heart and contraction signal, the chart printer was pressed to switch on. A button was given to the patient with the advice to press the button each time she felt foetal movement. The test was allowed to continue until either a reactive pattern was demonstrated or after 40 minutes of start of the test. Test was then evaluated as reactive or non- reactive on the basis of results.

Foetal Biophysical Profile (BPP) Test

NST was first done as described above, and then ultrasound examination was performed by real-time B-mode ultrasound with a 3.5 MHz transducer.

Foetal breathing movement, gross foetal body movement. Foetal tone and qualitative amniotic fluid volume were recorded as fixed criterion described [4]. (Table-I & II). Observations were continued as long as it took to identify the desired variables up to a maximum of 30 minutes. Each of the variables was evaluated as normal or abnormal as described in Table-1. In addition to five parameters like gestational age, presentation, placental position, grade of placenta, foetal heart movement and identification of any gross congenital anomaly were noted. Time of observation of BPP for each patient was also recorded.

Data Processing and Analysis

Data were analyzed using SPSS version 11.5 (Statistical package for social sciences). The tests of statistics used to analyze the data were descriptive statistics, Chi-square (2) Probability Test, Student's t-Test. The descriptive statistics were frequency, mean median and standard deviation. Continuous data were presented as mean and standard deviation (SD) and compared using Student's t-test. Categorical data were evaluated using Chi-square or Fisher's exact probability test. The foetal outcomes were compared between two groups of pregnant women - one group with BPP ≤ 6 and the other group with BPP ≥ 8. The level of significance was 0.05 and $p < 0.05$ was considered significant. The summarized information's were then presented in the form of tables and charts.

RESULTS

Table 1: Demographic characteristics of the patients (n = 53)

Age (yrs)*	Frequency	Percentage
<20	03	5.7
20-25	10	18.9
25-30	15	28.3
30-35	15	28.3
≥35	10	18.9
Parity		
Nulipara	17	32.1
Primipara	19	35.8
Multipara	17	32.1
Gravidity		
Primigravida	37	70.0
Multigravida	16	30.0
Gestational age(weeks)		
<37	15	28.3
37-42	38	71.7

*Mean age= (28.5±5.5) yrs; (19-39) yrs

A total of 60 pregnant women screened as 'high risk pregnancy were included in the study to predict their foetal outcome based on biophysical profile (BPP). Of the 60 patients 7 were not delivered at BSMMU and so the foetal outcome those 7 patients could not be assessed. Table I shows that out of 53 subjects participated in the study, 5.7% were below 20 years of age, 18.9% between 20-25 years, 28.3% between 25-30 years, another 28.3% between 30-35 years and 18.9% 35 or above 35 years of age. The mean age of the subjects was 28.5 ± 5.5 years and the lowest and highest ages ranged from 19 to 39 years. shows that 35.8% of the subjects were primipara and 32.1% multipara. The rest one-third (32.1%) of the subjects did not have any experience of having live-birth. demonstrates that 70% of the subjects were primigravida and the rest multigravida. Distribution of the subjects by gestational age shows that 71.7% lie between 37 - 42 weeks of gestation at the time of BPP. The rest 28.3% had gestational age below 37 weeks.

Table 2: Clinical characteristic of the study subjects (n = 53)

Characteristics	Frequency	Percentage
Systolic BP(>160 mmHg)	16	30.2
Diastolic BP(>95 mmHg)	18	34.0
Oedema	33	62.3
Proteinuria	27	50.9
Anaemia	40	75.5
Diabetes	11	20.8

***Total will not correspond to 100%**

Clinical presentation of the subjects at the time of BPP shows that predominant sign was anaemia (75.5%) followed by oedema (62.3%). prteinuria (50.9%), diastolic blood pressure (34%), systolic blood pressure (30.2%) and diabetes (20.8%) (Table 2).

Table 3: Obstetrics characteristic of the patient at BPP (n = 53)

Obstetrics variables	Frequency	Percentage
Membrane (n=53)		
Reptured	07	13.2
Intact	46	86.8
Meconium staining(n=53)		
Present	07	13.2
Absent	46	86.8

Of the 53 subjects, 7(13.2%) exhibited rupture of amniotic membrane at the time of BPP. Meconium stained amniotic fluid was also in 7 cases having rupture of membrane (Table 3).

Table 4: Distribution of the participants by BPP components (n=53)

BPP components	Frequency	Percentage
Breathing movement		
Normal (score 2)	51	96.2
Abnormal (score 0)	02	3.8
Gross body movement		
Present (2)	29	54.7
Decreased (score 0)	24	45.3
Tone		
Normal (score 2)	45	84.9
Decreased (score 0)	08	15.1
Non-stress test		
Reactive (score 2)	33	62.3
Non-reactive (score 0)	20	37.7
Amniotic Fluid Volume (AFV)		
Normal (score 2)	27	50.9
Decreased (score 0)	26	49.1
Total BPP score		

≤6	25	47.2
≥8	28	52.8

Table 4 demonstrates the distribution of cases by different components of biophysical profile. The BPP shows that majority (96.2%) of the foetus had normal breathing movement (30 seconds of sustained breathing movements in a 30 minutes observation period), 54.7% had normal body movement (3 or more gross body movements in a 30 minutes observation period). Normal fetal tone (one or more episodes of limb motion from a position of flexion to extension & a rapid return to flexion) and reactive NST (two or more FHR acceleration associated with fetal movement of at least 15 bmp & lasting at least 5 seconds in 10 minutes) were also observed in 84.9% and 62.3% cases respectively. Normal AFV was found (presence of a pocket of amniotic fluid that measures at least 2 cms in depth) in 50.9% of the cases. Total BPP score 8 or more and 6 or less were observed in 52.8% and 47.2% of the cases respectively.

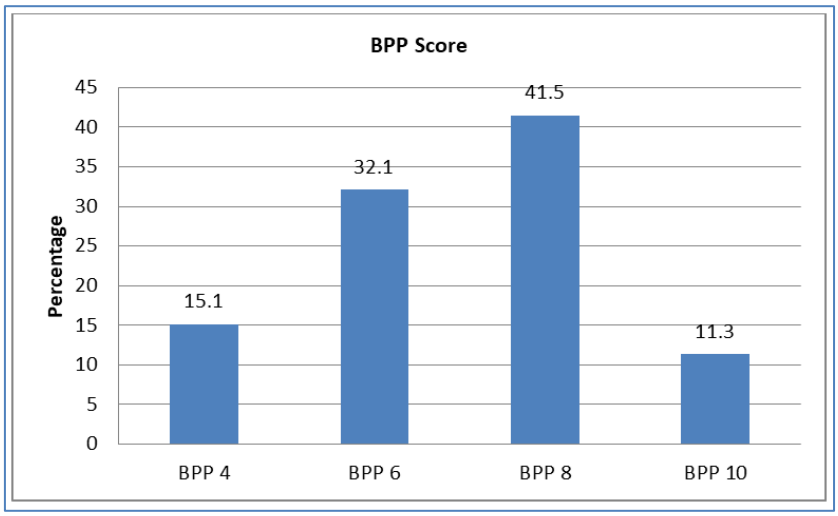

Figure 1: Distribution BPP Score among the subjects (n=53).

Fig. 1 depicts the distribution of cases by different BPP score. More than 40% of the cases had BPP score '8' followed by 32.1% score '6', 15.1% score '4' and 11.3% score '10'.

Table 5: Distribution of the subjects by delivery profile (n=53)

Delivery profile	Frequency	Percentage
Mode of delivery (n=53)		
Normal With Episiotomy	18	34.0
Normal Without Episiotomy	04	7.5
Vacuum	01	1.9
Caesarean section	30	56.6
Causes of caesarean delivery (n=53)		
Foetal distress	23	76.7
Prolonged labour	07	23.3
Analgesia/ Anaesthesia (n=53)		
None	02	3.8
Parenteral sedation	04	7.5
Local	17	32.1
Spinal	28	52.8
G/A	02	3.8

Of the total patients, 30(56.6%) required caesarean delivery, 18(34%) had normal delivery with episiotomy, 4(7.5%) normal without episiotomy and 1(1.9%) vacuum) (Table VI). The prime cause of caesarean delivery was foetal distress (76.7%) followed by prolonged labour (23.3%). Twenty eight subjects (52.8%) required spinal anesthesia, 17(32.1%) were delivered with local anesthesia, 4(7.5%) with parenteral sedation and 2(3.8%) neither analgesia nor anesthesia (Table 5).

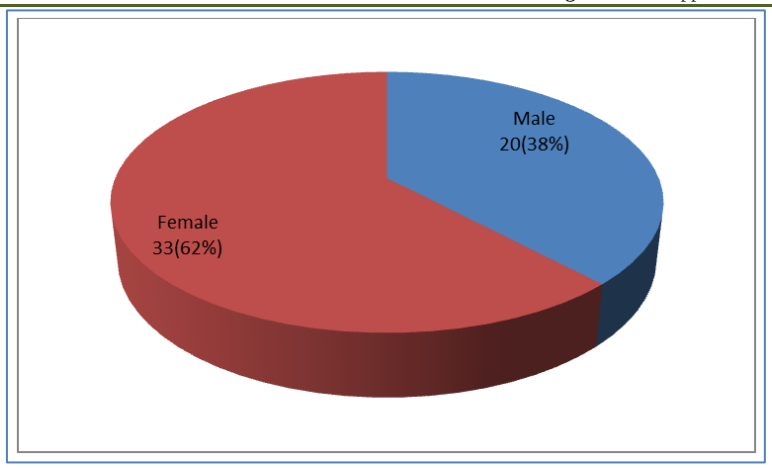

Figure 2: Distribution of neonates by sex (n=53)

A female preponderance (62%) was observed among the neonates giving a male- female ratio of roughly 3:2 (Fig. 2).

Table 6: Distribution of the patients by their birth weight (n=53)

Birth weight (gm)*	Frequency	Percentage
<2500	08	37.7
≥2500	45	62.3

***Mean birth weight**= (2976± 667) gm; **range:** (1400-4200)gm

Birth weight of the subjects show that 62.3% of the subjects were born with normal birth weight (2500 gm or more), while the rest with low birth weight (< 2500 gm) (Table 6).

Table 7: Detailed particulars of new-born babies (n = 53)

Perinatal outcome	Frequency	Percentage
Apgar score at 1 minute		
<=7	18	34.0
>7	35	66.0
Apgar score at 5 minute		
<=7	8	15.1
>7	45	84.9
Resuscitation		
Needed	15	28.3
Not needed	38	71.7
NICU admission		
Needed	15	28.3
Not needed	38	71.7
Neonatal seizure		
Developed	06	11.3
Not Developed	47	88.7
Hypoxic encephalopathy		
Developed	06	11.3
Not Developed	47	88.7
Perinatal outcome		
Still born	02	3.8
Born alive but died within 7 days	06	11.3
Survived without disability Total	45	84.9

Table 7 shows the perinatal outcome. Out of 53 neonates delivered, 18(34%) had APGAR score 7 or < 7 at birth, 8(15%) had APGAR score 7 or <7 at 5 minutes of birth, 15(28.3%) had to be admitted in hospital for resuscitation Other perinatal complications were complications neonatal; seizure (11.3%) and hypoxic encephalopathy (11.3%). Two babies (3.8%)

were still-born and 6(11.3%) died within 7 days of birth (Table 7).

Table 8: Association between demographic variables and BPP (n=53)

Demographic variables	BPP Score		p-values[#]
	≥8 (n=28)	≤6 (n=25)	
Maternal age (yrs)			
<30	12(42.9)	16(64.0)	0.124
≥ 30	16(57.1)	9(36.0)	
Gravidity			
Primi	6(21.4)	10(40.0)	0.142
Multi	22(78.6)	15(60.0)	
Gestational age (weeks)			
<37	1(3.6)	14(56.0)	<0.001
37-42	27(96.4)	11(44.0)	

#Data were analysed using Chi-square (χ^2) and presented as frequency and corresponding %.

Table 8 evaluates the influence of patients' demographic and obstetric characteristics on biophysical profile (BPP). Based on BPP score, the patients were divided into two groups one group with BPP ≥ 8 (n = 28) and the other group with BPP ≤6 (n = 25). A significantly higher proportion of foetus with BPP score 6 or below 6 (56%) was of gestational age below 37 weeks compared 3.6% of the foetus with BPP score 8 or > 8 (p<0.001). Maternal age and gravidity were not found to be associated with BPP (p>0.05).

Table 9: Association between condition of the membrane and BPP score (n=53)

Condition of Membrane	BPP Score		p-values[#]
	≥8 (n=28)	≤6 (n=25)	
Ruptured	1(3.6)	6(24.0)	0.035
Intact	27(96.4)	19(76.0)	

Table 9 shows the condition of the amniotic membrane on biophysical profile (BPP). Nearly one-quarter (24%) of the cases with BPP 6 or below 6 had ruptured membrane as opposed to 3.6% of cases with BPP 8 or greater than 8 (p=0.035).

Table 10: Association between BPP score and pregnancy outcome (n=53)

Outcome variables	BPP Score		p-value[s#]
	≥8 (n=28)	≤6 (n=25)	
Caesarean delivery			
Needed	13(46.4)	17(68.0)	0.114
Not needed	15(53.6)	8(32.0)	
Resuscitation			
Needed	4(14.3)	11(44.0)	0.017
Not needed	24(85.7)	14(56.0)	
APGAR1 1 minute			
<7	5(17.9)	13(52.0)	0.009
>7	23(82.1)	12(48.0)	
APGAR1 5 minute*			
≤7	2(7.1)	06(24.0)	0.092
>7	26(92.9)	19(76.0)	
NICU admission			
Needed	4(14.3)	11(44.0)	0.017
Not indeed	24(85.7)	14(56.0)	

Table 10 demonstrates the association between BPP and outcome variables. The need of caesarean delivery was observed to be less in cases with BPP ≥ 8 (46.4%) than that in cases with BPP ≤6 (68%), though the difference was not statistically signifiacnt (p = 0.114). Neonatal resuscitation needed was also much less in cases with BPP ≥8 (14.3%) than that in cases having BPP ≤ 6 (44%) (p=0.017). 45.9% More than half (52%) of the babies with BPP ≤ 6 had APGAR 7 or <7 at 1 minute of birth as opposed only 17.9% of those with BPP ≥ 8 (p = 0.009). APGAR at 5 minute of birth was also considerably higher in babies with BPP ≤ 6 (24%) than those with BPP ≥ 8 (p = 0.092). NICU admission was also significantly less in babies with

higher BPP score compared those with lower BBP score (p = 0.017).

DISCUSSION

In 1893 itself, Winkel set the limits of the fetal heart rate at 120-160 beats per minute. However, it was in 1950, when the first heart beat was heard by Phillipe-le-Goust [5]. Amniotic fluid fluctuations were demonstrated by amniocentesis and dilution studies [6]. Correlation of fetal heartrate pattern and neonatal outcome was done by [7]. Quantification of faetal activity in patient who were at risk of uteroplacental insufficiency was done [8]. In 1976, it was suggested by Lee that non-stress test could be a reliable method to predict FHR acceleration and fetal movements [9]. However, there are disadvantages of this test. FBP is time-consuming as it includes at least a 30 minutes observation period of fetal biophysical activities and NST, which requires 20-40 minutes. Moreover, an expensive fetal heart rate monitor and an experienced interpreter is needed. RBP is simpler, inexpensive, and is faster. It has been developed to evaluate fetal well-being when an NST machine is unavailable. The present study has demonstrated a correlation between RBP and FBP test and is very similar to results obtained [10]. Taking individual biophysical variables and comparing them with RBP in cases where the subject had an abnormal FBP score, only NST was found to have a statistically significant positive correlation with RBP. A multiparameter for assessing the condition of the fetus using four conditions such as foetal movement, tone, breathing and non-stress test was put forth by [4]. In 1983 however, a modification of this test was done by Vintzileous and added two more variables, the non-stress test and amniotic fluid index [11]. The outcome of the fetus on measuring the AFV was shown by Chamberlain in 1984 and Phelan using a semiquantitative test called amniotic fluid index (AFI) for the assessment of AFV [12, 13]. BPP was modified to MBPP only in the year 1996 [14]. The BPP uses ultra sound for the assessment of foetal movements, tone, breathing and amniotic fluid volume, with the monitoring of the foetal heartbeat over a 20- minute period. MBPP uses the CTG machine for the NST only. If an abnormality occurs, then the BPP is done. It is very essential in the antepartum foetal surveillance to identify the compromised fetus as early as possible so that timely intervention may be given. Out of the different surveillance methods available, the best would be the one which is capable of not only identifying the fetus at risk, but also is cost effective and easy to perform, with minimal or no risk. Modified BPP is one such test. In our study, 53 subjects participated in the study, 5.7% were below 20 years of age, 18.9% between 20-25 years, 28.3% between 25-30 years, another 28.3% between 30-35 years and 18.9% 35 or above 35 years of age. The mean age of the subjects was 28.5 ± 5.5 years and the lowest and highest ages ranged from 19 to 39 years. Shows that 35.8% of the subjects were primipara and 32.1% multipara. The rest one-third (32.1%) of the subjects did not have any experience of having live-birth. Distribution of the subjects by gestational age shows that 71.7% lie between 37 - 42 weeks of gestation at the time of BPP. The rest 28.3% had gestational age below 37 weeks. Gestational age of <33 weeks or >42 weeks, maternal magnesium administration, alcohol ingestion, maternal glucose, rupture of membranes and labour are some the factors which affecting the biophysical profile scoring (BPS) 10 Clinical presentation of the subjects at the time of BPP shows that predominant sign was anaemia (75.5%) followed by oedema (62.3%). prteinuria (50.9%), diastolic blood pressure (34%), systolic blood pressure (30.2%) and diabetes (20.8%). A recent study conducted by showed that abnormal BPS increased the risk of perinatal mortality by 50% (p=0.000) [15]. This study could not detect any significant association between Apgar score and neonatal morbidities, but showed significant correlation between BPS and caesarean section. Of the 53 subjects, 7(13.2%) exhibited rupture of amniotic membrane at the time of BPP. Meconium stained amniotic fluid was also in 7 cases having rupture of membrane. Demonstrates the distribution of cases by different components of biophysical profile. The BPP shows that majority (96.2%) of the foetus had normal breathing movement (30 seconds of sustained breathing movements in a 30 minutes observation period), 54.7% had normal body movement (3 or more gross body movements in a 30 minutes observation period). Normal fetal tone (one or more episodes of limb motion from a position of flexion to extension & a rapid return to flexion) and reactive NST (two or more FHR acceleration associated with fetal movement of at least 15 bmp & lasting at least 5 seconds in 10 minutes) were also observed in 84.9% and 62.3% cases respectively. Normal AFV was found (presence of a pocket of amniotic fluid that measures at least 2 cms in depth) in 50.9% of the cases. Total BPP score 8 or more and 6 or less were observed in 52.8% and 47.2% of the cases respectively. The distributions of cases by different BPP score. More than 40% of the cases had BPP score ‘8’ followed by 32.1% score ‘6’, 15.1% score ‘4’ and 11.3% score ‘10’. Although, the proportion seems to be high but while examining poor BPP and Apgar score at five minutes, no positive relationship was found out in a current study [15]. On the contrary, a study by reported better correlation between BPP score and Apgar score [16], of the total patients, 30(56.6%) required caesarean delivery, 18(34%) had normal delivery with episiotomy, 4(7.5%) normal without episiotomy and 1(1.9%) vacuum). A female preponderance (62%) was observed among the

neonates giving a male- female ratio of roughly 3:2. Birth weight of the subjects show that 62.3% of the subjects were born with normal birth weight (2500 gm or more), while the rest with low birth weight (< 2500 gm). The possible explanation for the variation of the result could be because of difference in proportions of subjects having IUGR babies, 12% in the study conducted by 35% in the later study [15, 16]. Out of 53 neonates delivered, 18(34%) had APGAR score 7 or < 7 at birth, 8(15%) had APGAR score 7 or <7 at 5 minutes of birth, 15(28.3%) had to be admitted in hospital for resuscitation other perinatal complications were complications neonatal; seizure (11.3%) and hypoxic encephalopathy (11.3%). Two babies (3.8%) were still-born and 6(11.3%) died within 7 days of birth. Evaluates the influence of patients' demographic and obstetric characteristics on biophysical profile (BPP). Based on BPP score, the patients were divided into two groups one group with BPP ≥ 8 (n = 28) and the other group with BPP ≤6 (n = 25). A significantly higher proportion of foetus with BPP score 6 or below 6 (56%) was of gestational age below 37 weeks compared 3.6% of the foetus with BPP score 8 or > 8 (p<0.001). Maternal age and gravidity were not found to be associated with BPP (p>0.05). The condition of the amniotic membrane on biophysical profile (BPP). Nearly one-quarter (24%) of the cases with BPP 6 or below 6 had ruptured membrane as opposed to 3.6% of cases with BPP 8 or greater than 8 (p=0.035). This data is suggestive of the BPS method of assessment of foetal risk is accurate and also provides insight into the extent of foetal compromise [17]. Biophysical profile also has a higher rate of sensitivity as compared to other methods like NST as reported in one study where foetal BPS had a higher rate of specificity and sensitivity. The negative predictive value (NPV) between the 2 methods was similar [18]. Table IX demonstrates the association between BPP and outcome variables. The need of caesarean delivery was observed to be less in cases with BPP ≥ 8 (46.4%) than that in cases with BPP ≤6 (68%), though the difference was not statistically signifiacnt (p = 0.114). Neonatal resuscitation needed was also much less in cases with BPP ≥8 (14.3%) than that in cases having BPP ≤ 6 (44%) (p=0.017). 45.9% More than half (52%) of the babies with BPP ≤ 6 had APGAR 7 or <7 at 1 minute of birth as opposed only 17.9% of those with BPP ≥ 8 (p = 0.009). APGAR at 5 minute of birth was also considerably higher in babies with BPP ≤ 6 (24%) than those with BPP ≥ 8 (p = 0.092). NICU admission was also significantly less in babies with higher BPP score compared those with lower BBP score (p = 0.017). Similar results were observed in a study by the predictive false positive and negative value in the case of BPP was slightly higher than MBPP, though not significant. Similar values were reported by Jamal et al., who found no significant difference in the specificity, sensitivity, PPV and NPV in the case of BPP and MBPP [19]. Young et al., and Miller et al., also showed similar results with comparable BPP and MBPP values [14- 20].

CONCLUSION

Present study shows that BPP and MBPP are both comparable to each other. Since BPP is a lengthier and time- consuming test requiring expertise. MBPP, which is a simpler test can be substituted. However, the final decision still remains with the attending gynecologis. They concluded that not all abnormal biophysical profiles scores are equal. The serious consequences may ensue from improper management decision based on the total BPP score rather than on careful evaluation of the individual test component.

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