**Research Article**

# A cross sectional study on adverse perinatal outcome
# in cases with poor biophysical profile

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## ABSTRACT

**Objective:** Tostudy of adverse perinatal outcome in patients with poor biophysical profile.

**Materials and Methods:** This cross sectional study was conducted at Department of Obstetrics &Gynecology THQ Hospital, Ahmedpur East from January 2017 to June 2017.  Total 100 patients between 20-35 years, with poor biophysical profile (A score of $\leq 8$ out of 10  by taking 5-parameters) screened on ultrasonographic examination, with singleton pregnancy confirmed by ultrasound and with 32-42 weeks of gestation calculated by last period of menstruation and confirmed by ultrasound were included.Adverse perinatal outcome i.e. cesarean section and poor APGAR score was assessed.

**Results:** Total 100 patients were selected for this study.  Mean age was $26 \pm 43$ years and mean gestational age of the patients was $37.78 \pm 2.66$ weeks.  Total 45 (45%) patients belonged to age group 20-25 years followed by 32 (32%) patients belonged to age group 26-30 years and 23 (23%) patients belonged to age group 31-35 years.  Cesarean section was performed in 75 (75%) cases and total 92 (92%) patients found with Poor APGAR Score

**Conclusion:** Frequency of adverse perinatal outcome such as cesarean section and Apgar score at 5 minutes in patients with poor biophysical profile was high.

 **Keywords:** Poor biophysical profile, cesarean section, Apgar score, gestational age.

## INTRODUCTION

 Perinatal period is the most vulnerable period in the life of an individual and the rate of death during this period is higher than any other period of life. Pre term births, infection, hypertensive disease and intrapartum asphyxia are cited as most important contributors for perinatal mortality.[1] Almost 2/3rd of perinatal deaths occur due to obstetrical factors, perinatal hypoxia and infection, which are preventable causes. To address this problem various antenatal foetal surveillance methods have been devised in the past few decades and the search for best is still ongoing. Antepartum foetal testing is a compilation of methods devised to differentiate normal from compromised foetuses prior to onset of labour. The main techniques for foetal assessment are non-stress test (NST), contraction stress test (CST), biophysical profile, foetal movement count and modified biophysical profile and umbilical artery Doppler velocimetry.[2] The NST and CST were two primary methods available for foetalsurveillance but are poor predictors of an asphyxiated infant.

Biophysical profile is the combination of NST and dynamic real-time B mode ultra-sonographic assessment of certain foetal parameters. It is a clinical tool that integrates level of dynamic biophysical activities into a usable standard.[3] It

includes both acute markers of foetal status and some chronic markers of foetal and intrauterine condition. Biophysical profile predicts neonatal acidosis at delivery better than Apgar score and thus the risk of foetal death.[4] In a compromised foetus measures can be taken to intervene before progressive metabolic acidosis leads to foetal death.[5-8]

Advantage of using BPP in assessing foetal wellbeing is its wide acceptability, non-invasive nature, less time consumption and providing complete information about foetal anatomy and parameters reflecting acute and chronic response to asphyxia.[9] It evaluates neuro behaviour of foetus and status of placenta.[10] The BPPscore and Doppler sonography effectively stratify intrauterine growth restricted (IUGR) foetuses into risk categories.[11]

Parameters included in BPP are NST, ultra-sonographic measurement of the Amniotic fluid volume, presence or absence of foetal breathing movements, gross body movements and foetal tone.[12] The NST included reactive foetal heart rate, foetal breathing movements, foetal activity / gross body movements, foetal muscle tone and qualitative amniotic fluid volume/ amniotic fluid index. The BPS $\leq 6$ has significant association with early neonatal morbidity.[13] Thus, this study was conducted to record the BPP in pregnancy at $\geq 36$ weeks period of gestation and correlation of BPP with neonatal outcome was evaluated.

**OPERATIONAL DEFINITIONS**
**POOR BIOPHYSICAL PROFILE:**
A score of $\leq 8$ out of 10 between 32-42 weeks of gestation was considered as poor biophysical profile, it was assessed on ultrasound by measuring 5-parameter: fetal breathing, movements, tone, amniotic fluid index and non stress test

**ADVERSE PERINATAL OUTCOME:**
- Cesarean section: Abdominal delivery was considered as cesarean section
- APGAR score at 5 minutes i.e. $\leq 8$ was considered as poor apgar score

**MATERIALS AND METHODS**
This cross sectional study was conducted at Department of Obstetrics & Gynaecology THQ Hospital, Ahmedpur East from January 2017 to June 2017. Total 100 patientsbetween 20-35 years, with poor biophysical profile (A score of $\leq 8$ out of 10 by taking 5-parameters) screened on ultrasonographic examination, with singleton pregnancy confirmed by ultrasound and with 32-42 weeks of gestation calculated by last period of menstuation and confirmed by ultrasound were included. Women with known medical disorders i.e. congenital fetal anomalies (on history and medical record) and woman admitted for Elective Lower Cesarean Section were excluded from the study. Study was approved by ethical committee and written informed consent was taken from every patient. History and physical examination of all the patients was done. They were screened on the basis of biophysical profile on ultrasonography to confirm the poor biophysical profile. Patients were followed till delivery. Adverse perinatal outcome i.e. cesarean section and poor APGAR score (according to operational definition) were recorded. All this information was recorded on a pre-designed proforma.

All the collected was analyzed by using SPSS version 20. Descriptive statistics were applied to calculated mean and standard deviation for maternal age, gestational age. The final outcome i.e. adverse perinatal outcome (cesarean section and poor apgar score at 5 minutes) and parity of subjects were presented as frequency and percentage. Stratification was done to control effect modifier like maternal age, gestational age and parity of the patients.

**RESULTS**
Total 100 patients were selected for this study. Mean age was $26 \pm 43$ years and mean gestational age of the patients was $37.78 \pm 2.66$ weeks. Patients were divided into 3 age groups, age group 20-25 years, age group 26-30 years and age group 31-35 years. Total 45 (45%) patients belonged to age group 20-25 years followed by 32 (32%) patients belonged to age group 26-30 years and 23

(23%) patients belonged to age group 31-35 years. (Table 1)

Patients were divided into two groups according to gestational age, 32-37 weeks gestation group and 38-42 weeks gestation. Total 38 (38%) patients belonged to 32-37 weeks gestation age

group and 62 (62%) patients belonged to 38-42 weeks gestation age group. (Table 2)Primary paras were 45 (45%) and multiparas were 55 (55%) (Table 3)Cesarean section was performed in 75 (75%) cases. (Table No.4)Total 92 (92%) patients found with Poor APGAR Score (Table 5)

**Table No.1:** Age Distribution

| Age group | Number | Percentage |
|-----------|--------|------------|
| 20-25 | 45 | 45 |
| 26-30 | 32 | 32 |
| 31-35 | 23 | 23 |

**Table No.2:** Gestational Age Distribution

| Gestational age | Number | Percentage |
|-----------------|--------|------------|
| 32-37 weeks | 38 | 38 |
| 38-42 weeks | 62 | 62 |

**Table No.3:** Parity Distribution

| Parity Status | Number | Percentage |
|---------------|--------|------------|
| Nulliparity | 45 | 45 |
| Multiparity | 55 | 55 |

**Table No.4:** Frequency of Cesarean section

| Cesarean section | Number | Percentage |
|------------------|--------|------------|
| Yes | 75 | 75 |
| No | 25 | 25 |

**Table No.5:** Frequency of Poor APGAR Score

| Poor APGAR Score | Number | Percentage |
|------------------|--------|------------|
| Yes | 92 | 92 |
| No | 8 | 8 |

## DISCUSSION

The BPP is non-invasive test that predicts the presence or absence of foetal asphyxia and, ultimately, the risk of foetal death in the antenatal period. When the BPP identifies a compromised foetus, measures can be taken to intervene before progressive metabolic acidosis leads to foetal death.[14]

Patients were divided into 3 age groups, age group 20-25 years, age group 26-30 years and age group 31-35 years. Total 45 (45%) patients belonged to age group 20-25 years followed by 32 (32%) patients belonged to age group 26-30 years and 23 (23%) patients belonged to age group 31-35 years. A study conducted by Sharami et al[15] noted that age does not seem to have any significant association with high risk pregnancies. Majority

of the patients in the mentioned study were between the ages of 20-30 years of age.

Patients were divided into two groups according to gestational age, 32-37 weeks gestation group and 38-42 weeks gestation. Total 38 (38%) patients belonged to 32-37 weeks gestation age group and 62 (62%) patients belonged to 38-42 weeks gestation age group. 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).[16]

One of the key components of final outcome in current study was cesarean section. Majority of the patients in current study, 75 (75%) had cesarean section. A recent study conducted by Manandhar BL et al[17] showed that abnormal BPS increased the risk of perinatal mortality by 50%

(p=0.000). This study could not detect any significant association between Apgar score and neonatal morbidities, but showed significant correlation between BPS and caesarean section. In the mentioned study, nine (60%) of 15 subjects from BPS 8 group and three (75%) of four subjects from BPS 4 group had caesarean.

In our study, poor APGAR score at 5 minutes was noted in 92 (92%) patients. 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.[17] On the contrary, a study by Hina et al,[18] reported better correlation between BPP score and Apgar score. 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 Manandar BL et al[17] and 35% in the later study.[18]

It is documented that normal bio-physical profile score confers a very high probability of perinatal survival.[19] A fetus with very low score has very high rate of perinatal mortality, higher fetal distress rate, intrauterine growth restriction, admission to the neonatal units, 5 minute Apgar score < seven and umblical artery pH < 7.20. This data is suggestive of the BPS method of assessment of fetal risk is accurate and also provides insight into the extent of foetal compromise.[20]

BPP also have a higher rate of sensitivity as compared to other methods like NST as reported in one study where fetal BPS had a higher rate of specificity and sensitivity. The negative predictive value (NPV) between the 2 methods was similar.[21] There was a demonstrable reduction in the incidence of cerebral palsy when BPP was used as a tool in antepartum assessment when compared with untested patients. A low score increases the likelihood of cerebral palsy.[21]

## CONCLUSION
Frequency of adverse perinatal outcome such as cesarean section and Apgar socre at 5 mintues in patients with poor biophysical profile was

high.The biophysical profile testing gives a numerical score and thus an objective assessment which can be used in detecting various degrees of fetal compromise. In pregnancies at increased risk for adverse perinatal outcome, biophysical profile can provide a valuable assistance for evaluation of fetal well-being.

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