

Study of Adverse Perinatal Outcome in Patients with Poor Biophysical Profile

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ABSTRACT

Aim: To study of adverse perinatal outcome in patients with poor biophysical profile.

Methods: This multi-centre descriptive cross sectional study was carried out at Department of Obstetrics and Gynecology Bolan Medical Complex Hospital Quetta and Services Hospital, Lahore from 1st January 2016 to 30th June 2016. A total number of 273 cases having age between 20-35 years were analyzed. All the patients had poor biophysical profile (A score of ≤ 8 out of 10 by taking 5-parameters) screened on ultrasonographic examination, with singleton pregnancy.

Results: Out of a total of 273, 115(42.1%) were between the age of 20-25 years, 97(35.6%) between 26-30 and 61(22.3%) between 31-35 years. There were 97(35.5%) patients who were between the gestational age of 32-37 weeks and 176(64.5%) between 38-42 weeks. Majority of the patients, 161(59%) were multiparous. Majority of the patients, 197(72.2%) had cesarean section and poor Apgar score in newborns at 5 minutes, 246 (90.1%).

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

The biophysical profile (BPP) is a non-invasive test which can predicts the absence or presence of foetal asphyxia and risk of foetal death during antenatal period¹. When the BPP identifies a compromised fetus, interventive measures can be taken before progressive metabolic acidosis leads to foetal death^{2,3}. The BPP combines the data from foetal heart rate monitoring and USG imaging.

The measurement of amniotic fluid volume (AFV) was done by using dynamic real time B-mode USG and to observe the several types of movements of foetal. The FHR is obtained by using a pulsed Doppler transducer integrated with a high speed microprocessor, which provides a continuously updated reading⁴.

The BPP is a very important clinical tool that integrates dynamic biophysical activities level into a usable standard⁵. The BPP allows 2 points for each parameter that is present, yielding a maximum score of 10; however, if all variables of USG are normal, the FHR variable may be excluded because no change is made in the predictive accuracy of the BPP by including the FHR. If 1 or more ultrasonographic variables are abnormal, the NST (Non Stress test) should be performed⁶.

A recent study⁷ recorded significantly higher adverse outcome in patients having abnormal biophysical profile by calculating 77% caesarean section rate, while 100% of ≤ 8 apgar score at 5 minutes, while another study⁸ recorded these findings significantly higher ($P < 0.001$) than normal biophysical profile, being the limitation on access the exact magnitude is missing.

As there is no local study available, we are conducting this study in this area where facilities for invasive tests are not available and patients are non-affording therefore this noninvasive test is used to predict the presence or absence of adverse foetal outcome for their timely management and use this tool in future in our routine practice.

PATIENTS AND METHODS

This multi-centre descriptive cross sectional study was comprised 273 and carried out Department of Obstetrics and Gynecology Bolan Medical Complex Hospital Quetta and Services Hospital, Lahore from 1st January 2016 to 30th June 2016. Patient's age between 20-35 years and para 3, singleton pregnancy confirmed by ultrasound and gestational age: 32-42 weeks of gestation calculated by last period of menstruation and confirmed by ultrasound were included. Women with known medical disorders i.e., congenital foetal anomalies (on history and medical record) and elective lower caesarean section were excluded. History and physical examination of all the patients was done. They were screened on the

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basis of biophysical profile on ultrasonography to confirm the poor biophysical profile as mentioned in the table above. Patients were followed till delivery. Adverse perinatal outcome i.e., caesarean section and poor APGAR score (according to operational definition) were recorded.

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 (caesarean 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

Amongst a total of 273 patients with poor BPP, mean age was 27 ± 4.2 years and mean gestational age of the patients was 37.8 ± 2.0 weeks. There were 115(42.1%) patients who were between the age of 20-25 years, 97(35.6%) between 26-30 and 61(22.3%) between 31-35 years (Fig. 1). There were 97(35.5%) patients who were between the gestational age of 32-37 weeks and 176(64.5%) between 38-42 weeks (Fig. 2). Majority of the patients 161(59%) were multigravida while 112(41%) were nulliparous (Table 1). When adverse perinatal outcomes between all the patients with poor BPP were noted, majority of the patients, 197(72.2%) had caesarean section. When APGAR score at 5 minutes were noted, majority of the patients, 246(90.1%) had poor APGAR score at 5 minutes (Tables 2-3).

Fig. 1: Age distribution

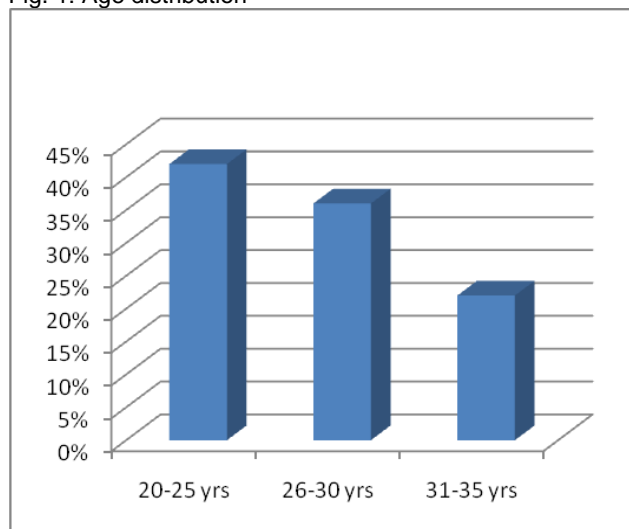


Table 1: Parity distribution (n = 273)

Parity Status	n	%age
Nulliparity	112	41
Multiparity	161	59

Fig. 2: Gestational age distribution

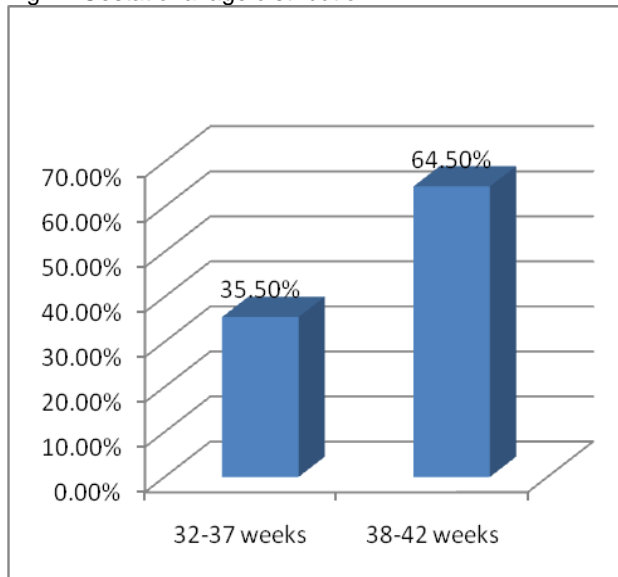


Table 2: Frequency of cesarean section (n = 273)

Cesarean section	n	%age
Yes	197	72.2
No	76	27.8

Table 3: Frequency of Poor APGAR Score (n = 273)

Poor Appar Score	n	%age
Yes	246	90.1
No	27	9.9

DISCUSSION

The purpose of current study was to find out the frequency of adverse perinatal outcome in patients with poor biophysical profile. In the current study, 115(42.1%) patients were between the age of 20-25 years, 97(35.6%) between 26-30 and 61(22.3%) between 31 and 35. A study conducted by Sharami et al⁸ 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.

In current study, most of the patients (64.5%) were between the gestational age of between 38-42 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.

One of the key components of final outcome in current study was caesarean section. Majority of the

patients in current study, 197 (72.2%) had caesarean section. A recent study conducted by Manandhar et al¹¹ 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 246 (90.1%) 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.¹¹ On the contrary, a study by Hina et al¹² 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 al¹¹ and 35% in the later study¹².

It is documented that normal bio-physical profile score confers a very high probability of perinatal survival¹³. A fetus with very low score has very high rate of perinatal mortality, higher foetal distress rate, intrauterine growth restriction, admission to the neonatal units, 5 minute Apgar score <seven and umbilical artery pH <7.20. This data is suggestive of the BPS method of assessment of foetal risk is accurate and also provides insight into the extent of foetal compromise¹⁴.

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 similar¹⁵.

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 palsy¹⁵.

CONCLUSION

Frequency of adverse perinatal outcome such as caesarean section and Apgar score at 5 minutes 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 foetal compromise. In pregnancies at increased risk for adverse perinatal outcome, biophysical profile can provide a valuable assistance for evaluation of foetal well-being.

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