Comparison of the Revised Biophysical Profile Test with Complete Biophysical Profile Test in Pregnancy

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Abstract: One of the best tests for assessment of fetus is biophysical profile test and performance of this has significant effects in fetus health and outcome of pregnancy. The aim of this study, is comparison of modified biophysical profile test with complete biophysical profile test. A cross-sectional and prospective analytical study that performed in Kosar hospital of Qazvin at 2004S, 600 high risk pregnant women of 15-45 years of ages that gestational age was >32 weeks were chosen for any patient both of test were performed and then sensitivity, specificity, positive and negative predictive value were compared together and then analyzed with statistics. Sensitivity in complete biophysical profile was 98.5% and in modified biophysical profile was 98.4%. Specificity in complete biophysical profile was 82.6% and in modified biophysical profile was 81.2%. Positive predictive value in complete biophysical profile was 99.7% and in modified biophysical profile was 99.7%. Modified biophysical profile test can be replaced for assessment of fetus health and outcome of pregnancy.

Key words: Biophysical, pregnancy, fetus, test, profile, health

INTRODUCTION

Every day many pregnant women give birth to their children all around the world. But it is under investigation low babies can be healthy, because giving birth to retarded babies causes or leads to adverse outcome such as babies emotional effects and high costs of treatment. So, the chief point is to born a healthy or (well being) baby and there are different ways to assess pregnancy out comes in pregnant women. Here, we want to use Modified biophysical test including 2 measurements of 5 in comparison with the standard BPP test (Cunningham *et al.*, 2005; Clark *et al.*, 1989; Freeman *et al.*, 1982; Nageotte *et al.*, 1994).

The results of a standard BPP test are scored on 5 measurements in a 30 min observation period while, the results of a modified BPP test require 2 modalities for fetal evaluation in a 10 min observation period. So, modified type in comparison can save time, money and personnel services and there is no need to an expert technologists or radiologist and if our hypothesis is proved or accepted, standard BPP test can be placed by modified BPP test (Cunningham *et al.*, 2005; Clark *et al.*, 1989).

Biophysical Profile test (BPP test): Manning *et al.* (1980) demonstrated that by integrating 5 biophysical parameters we can predict fetal health more precisely than using these parameters one by one. Their hypothesis based on 5 parameters reduces remarkably pulse positive and pulse negative results.

However, Manning *et al.* (1985) reported that antenatal fetal death with normal structure defined as false-normal test rate is 1/100. The most important point is the results from 97% of checked or tested pregnancies were normal.

The false-negative mortality rate is defined as the number of fetal deaths corrected for congenital bleeding that occurs in a normal test result.

Causes of fetal deaths in 2/3 of them a predictable Manning *et al.* (1980, 1985) have described 493 fetuses that cordocentesis was performed immediately following a BPP scoring about 20% of tested fetuses were growth retarded and Autoimmune hemolytic anemic.

BPS (biophysical scoring) of 0 is always associated with an acidemia pH of <7.20. While, the scores of 8-10 are associated with normal pH. Score of 6 is a poor predicting factor for outcomes. Reduction of an abnormal result of

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score of 2-4 to a very abnormal score (i.e., 0) is a very accurate or precise predicting factor for abnormal outcomes (Cunningham *et al.*, 2005; Clark *et al.*, 1989; Freeman *et al.*, 1982; Nageotte *et al.*, 1994; Manning *et al.*, 1980, 1985).

The modified biophysical profile is troublesome and requires an expert for US monitoring (Cunningham *et al.*, 2005).

Major goals: Comparison of modified BPP test with standard BPP test in outcome of pregnancy.

Minor goals: Sensitivity and specificity and positive predictive value and negative predictive value.

MATERIALS AND METHODS

In a cross-sectional and prospective analytical study, 600 high risk pregnant women of 15-45 years of ages referring to Kosar hospital, in 2004S selected and evaluated.

And both the standard BPP test and the modified BPP test were performed and according to them the outcome of pregnancy was studied.

Standard BPP test include: NST, AF, fetal tone, fetal movements and fetal breathing.

Modified BPP test only include: NST and AF comparition 6 of these 2 parameters.

We should remind that ethically, the method and the aim was described to the individuals before anything is dine and probable side effects and benefits were discussed, too and at last a satisfaction letter was filled by the patients and recorded in their file and also there was an agreement form for the husband and was filled by him.

RESULTS

The survey was conducted in 2004s on 600 high risk patients of 15-45 years of ages with the gestational age of <32 weeks in Kosar hospital. Maximum parity was 5 and both the standard BPP test and the modified BPP test was performed.

Indications for the study participants: Age group (age limit). The people with the age group 14-45 were 5% (30 people) and the group (limit) of 26-35 years old people were 76% (456 people) and the limit of 36-45 years old people were 19% (114 people) (Table 1).

Considering parity, people in the age limit of 15-25 were 85% of 1st parity and 14% of 2nd parity 1% of 3rd parity.

Table 1: Age distribution of patients

Age group of patients	Frequency	Percentage
15-25	30	5
26-35	456	76
36-45	114	19

Table 2: Gestational age distribution of patients

Gestational age (weeks)	Frequency	Percentage
40-41	126	30.0
41-42	242	57.6
42-43	43	10.2
43>	9	2.2

Table 3: Comparison new test by standard test

Parameters	New test (%)	Standard test (%)
Sensitivity	98.4	98.5
Specificity	81.2	82.6
Positive predictive value	39.3	43.2
Negative predictive value	99.7	99.7

People in the age limit of 26-35 were 1% of 1st parity and 70% of 2nd parity and 20% of 3rd parity and 5% of 4th parity and 4% of 5th parity.

Mean post data gestational age:

- In the 40-41 weeks age: 126 people (30%)
- In the 41-42 weeks age: 242 people (57.6%)
- In the 42-43 weeks age: 43 people (10.2%)
- In the age over 43 week: 9 people (2.2%) (Table 2)

Mean gestational age of diabetics was 38 weeks and mean age of IUGR was 39 weeks. Mean age of HTN was 37 weeks. Mean age of stillbirth was 39 weeks. Mean age of aligohydroamnious was 41 weeks.

- Thirty three people (5.5%) had NST and results of 5 people was non interpretable
- Forty eight people had AF (Amniotic fluid) <5 cm and 12 people (2%) had AF >8 cm while, 540 people (90%) had normal AF
- BPS in 578 (96.3%) was 8-10, in 22 (3.7%) was 6 or <6
- Cesarean cases with abnormal test results were 117 people while, cesarean cases with normal test results were 57 people
- About 10.2% (12 people) of cesarean cases of individuals with abnormal tests was because of fetal distress while, 5.2% (3 people) of cesarean cases with normal test was because of fetal distress

Apgar of 5th min <7 was in 2 cases with abnormal tests:

- About 21.6% (25 people) with abnormal test had cesarean because of moconiuom
- False positive modified BPT caused 1.7% (1 people) of preterm labor

- Standard BPT had the sensitivity of 98.5% while, sensitivity of modified BPT was 82.6%. Considering p>0.05, it is statistically meaningless (Table 3)
- Positive predictive value of standard BPP test was 43.2% while, predictive value of modified test was 39.3% considering p>0.05 (p>0.05), it is statistically meaning less (Table 3)
- Negative predictive value of standard BPP test was 99.7% while, negative predictive value of modified test was 99.7% considering p>0.05, it is statistically meaning less

DISCUSSION

Similarly, Salvesen *et al.* (1993) in 41 diabetic pregnancies correlated (associated) BPP with umbilical venous cord pH level and these researchers noticed that an abnormal pH in remarkably associated with a poor BPS and they also, concluded that BPP has a narrow value in predicting fetal pH, because Antenatal tests of 9 fetuses with low acidemia was normal.

Weiner *et al.* (1996) studied potential tests meanings in 135 fetuses with obvious growth retardation and come to the same conclusion. They discovered the morbidity and mortality in completely growth retarded conditions of fetus has no association with abnormal fetus tests.

Clark *et al.* (1989) used modified BPP as that first antenatal screening test. Especially, MBPP consisting of NST and AFI was used twice a week in 2628 pregnancies.

It required 10 min to perform that test typically so these researchers concluded modified BPP is the best method for antenatal evaluation become there hadn't been any unpredictable fetal deaths.

Miller *et al.* (1996) reported the results of <54000 modified BPP in 15400 high-risk pregnancies. They added that 0.8 in 1000 cases were false negative a 1.5% was false positive.

Obstetrics and gynecology college of USA (1999) accepted the modified BPP as an acceptable method of fetal antenatal evaluation (Cunningham *et al.*, 2005).

Negeotte *et al.* (1994) in long back memorial women's hospital studied pregnancy outcomes of performed prenatal modified BPP test. and concluded it as a wonderful test to evaluate fetal care assesses high risk patients with hazardous pregnancy.

Miller (1998) in Los Angles studied on false positive and false negative results of antenatal modified BPP tests concluded that false negative results of modified BPP was lesser than NST and is outstandingly comparative with false negative results of CST and BPP. CST = Contraction Stress Test and BPP = Biophysical Profile (Miller, 1998).

This present study, was done on 600 patients and came to the conclusion that modified BPP test is an excellent method to evaluate and take care of fetus in high-risk patients in pregnancy outcome. These conclusions were the same as the Nageotte *et al.* (1994).

Miller (1998) in Los Angles concluded that false negative and false positive results of modified BBP remarkably were comparable with the false negative and false positive results of standard BPP test.

CONCLUSION

Modified BPP test is outstandingly comparable with standard BPP test based on evaluation of fetal well being, sensitivity, specificity, positive and negative predictive value. So, it can be used to evaluate and take core of the fetus and find high risk patients with adverse pregnancy outcomes instead of standard BPP test. The result will be saving time and personnel service and also, low expenses. Nowadays, time saving and expense reduction is a very important matter and here we recommended measuring AFV only to evaluate fetal well being.

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