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## Sonographic evaluation of outcome of a patient presenting with less fetal movements patient

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### Abstract

**Background:** A biophysical profile (BPP) is a prenatal ultrasound evaluation of fetal well-being involving a scoring system with the score being termed Manning's score. It is often done when a non-stress test (NST) is non-reactive. Typically, it takes about 30 to 70 minutes to complete. It is done specially to see pregnancy and neonatal outcome with a patient presenting with less fetal movement.

**Methods:** One hundred women having singleton pregnancy with gestational age  $\geq 34$  weeks with complaints of less fetal movement and intact membrane and no labour pain were interviewed and finally their biophysical profile was done.

**Results:** A total of 100 pregnant women were included in the study. Maximum number was found in the age group of 25-29 years and the mean ( $\pm$ SD) age was  $29.5 \pm 4.4$  with ranged from 20 to 38 years. Among them 83 number of patient having 34-37 weeks of pregnancy & 17 patient were 38-40 weeks of pregnancy. Most of the patients were found lower abdominal pain (25%) H/O subfertility (20%), H/O previous C/S (15%), dysuria (12%), and BOH (9%). According to abnormal biophysical profile score it was found that 5(71.4%) were referred to scabu, out of which 1(14.3%) asphyxiated, 2(28.6%) cord around the neck, 4(57.1%) liquor stained and 1(2.9%) perinatal death. According to equivocal biophysical profile score 8(22.9%) fetal outcome were good and 26(74.3%) referred to scabu, out of which 15(42.9%) asphyxiated, 6(17.1%) cord around the neck, 6(17.1%) liquor stained and 1(2.9%) perinatal death.

**Conclusion:** Low biophysical Profile score is proportionately associated with the poor outcome of neonates. BPP scoring helps the clinician to take decision for elective delivery of subjects and to take adequate preparation for neonatal resuscitation.

**Keywords:** BPP (Biophysical Profile), less fetal movements, neonatal resuscitation, sonographic evaluation

### Introduction

Fetal movement counts have been recommended over the past 3 decades to women in the 2<sup>nd</sup> half of pregnancy as a way of monitoring fetal wellbeing<sup>1</sup>. The majority of women have favored the activity of monitoring the fetal movement. Fetal movement count by mother is an ideal first line screening test for high & low risk patients. A healthy fetus should have minimum 10 movements in 12-hour period. Awareness of counting the frequency of fetal movement is an in-expensive simple task<sup>[2, 3]</sup>. Fetal movement serves as an indirect measure of central nervous system integrity and function. The fetus responds to chronic hypoxia by conserving energy and subsequent reduction in fetal movement as an adaptive mechanism to reduce oxygen consumption<sup>[4]</sup>. Regular fetal movement can be regarded as an expression of fetal well-being. All pregnant women should be counselled to keep an eye on fetal movements. Various techniques of keeping a fetal movement record have been described, which include – count to ten methods, twelve hours' record and post meals count. Counting of fetal movements for 30-60 minutes after meal has been popular because of the belief that fetal movements increased post prandially<sup>[1]</sup>. It has been proposed that maternal perception of reduced fetal movements may be indicative of placental insufficiency. There are many pathological cause of reduce fetal movements including acute and chronic fetal hypoxia & fetal anomaly especially those involving neurological, musculo-skeletal system, anterior placenta, hydramnios, Obesity, drugs (narcotics)<sup>[5]</sup>. It is recognized that intrauterine death is preceded by cessation of fetal movements for at least 1 day<sup>[1]</sup>.

A reduction of fetal movement causes concern and anxiety is a common indication for the assessment of fetal well-being [6]. Patients presenting with less fetal movement should be evaluated by bio physical profile. The BPP provides a detailed assessment of the behavioral state of fetus in utero. The concept is analogous to neonatal assessment by the Apgar score. It is used both as a backup, test when the NST (CTG) is non-reactive and as a first line test. It includes ultrasound monitoring of fetal movements, fetal tone, fetal breathing, Liquor volume and no stress test (NST). All the parameters except the last are assessed by real time B mode ultrasound. This requires higher level skill than NST. Each of five Parameters is given a score '0' if absent and '2' if present. With a minimum score of 10/10 if all the ultrasonic variables are present no stress test (NST) is reactive. The scanning time should continue for at least 30 minutes before an abnormal score is assigned. [7] When the BPP is normal it excludes hypoxia of the end organ. Acceleration Seen on the CTG suggest good cardiovascular reserve, fetal breathing suggests a well oxygenated brain stem, fetal tone and movement signify well oxygenated midbrain and cerebral cortex, normal amniotic fluid indicates well perfuse fetal kidney and placental function. The reliability of the test depends not only on the total score but also on the parameter that is abnormal. The perinatal mortality is higher. When scored is 6 or 8 in associated with abnormal amniotic fluid. A grossly abnormal test score-0 to 4/10 has higher probability of fetal hypoxia [7-9]. In summary, maternal assessment of fetal movement may be a valuable way to detect fetal compromise. It is postulated that there is an interval between the onsets of placental insufficiency & fetal demise in which the fetus has reduced movements. Biophysical profile & NST (CTG) as a routine assessment is performed in an effort to identify the fetus that may be at risk of poor pregnancy outcome. These women should be carefully investigated & monitored to improve the obstetric to outcome [2, 10].

### Materials and Methods

This cross sectional study was conducted in the Department of Obstetrics & Gynecology Dhaka Medical College, Dhaka during the Period of July 2009 to December 2009 (Six months) written consent was taken from all the patients. Sample selected by purposive sampling. A total of 100 pregnant women were included. Maximum number was found in the age of 25-29 year and the mean ( $\pm$ SD) age was 29.5 $\pm$ 4.4 with ranged from 20 to 38 years. Patients were selected those who had Singleton Pregnancy with gestational age  $\geq$ 34 week, complaints of less fetal movement with intact membrane with no labour pain. Patients with complaints of absent fetal movement, with high risk pregnancy-PET, Heart disease, DM, Rh-is immunization and IUGR, PROM, IUD & pregnancy of less than 34 weeks' duration were excluded from this study. All the patients did their baseline investigations and biophysical profile.

All case were interviewed face to face using specially designed questionnaire Data were processed and analyzed using Computer software SPSS-23 (Statistical package for

social science). OR (Odd ratio) is "detected to evaluate the risk measurement in this cross sectional study. Before commencing. The study permission was taken from Director of the DMCH & respective unit head of the Department of obstetrics & Gynaecology, participation in this study was voluntary and written informed consent was taken.

### Results

A total of 100 pregnant women were included in the study. Maximum number was found in the age group of 25-29 years and the mean ( $\pm$ SD) age was 29.5 $\pm$ 4.4 with ranged from 20 to 38 years. Among them 83 number of patient having 34-37 weeks of pregnancy & 17 patient were 38-40 weeks of pregnancy. Most of the patients were found lower abdominal pain (25%) H/O subfertility (20%), H/O previous C/S (15%), dysuria (12%), and BOH (9%). Regarding the parity, it was observed that para 1(25%) & Primigravida (47%) were predominant. 4.5% patient received antenatal checkup and 55% didn't receive any antenatal checkup. Out of 58% cases underwent termination and rest 42% received conservative treatment. Majority 54% of the patients underwent caesarian section and 4% normal vaginal delivery. All the patients who received conservative treatment had normal biophysical profile score (8-10) (42%), although 16 (16%) of patients with normal BPP score underwent termination. According to abnormal BPP Score it was found that 5(71.4%) were referred to scabu, out of which 1 (14.3%) asphyxiated, 2 (28.6%) cord around the neck, 4(57.1%) Liquor Stained & 1 (2.9%) perinatal death According to equivocal (6-7) BPP score 8 (22.9%) fetal outcome were good & 26(74.3%) referred to scabu. Out of which 15 (42.9%) asphyxiated. 6 (17.17.) cord around the neck 6(17.1%) liquor stained & 1(12.9%) Perinatal death. More than one third (39.7%) fetal outcome were good. 32 (55.2%) referred to scabu; 16 (27.6%) asphyxiated, 3 (5.2%) perinatal death, 8(13.8%) cord around the neck and 11 (19.0%) liquor stained.

**Table 1:** Distribution of the study subjects by age (N=100)

Age in years	N. of Patients	Percentage
20-24	29	29.0
25-29	34	34.0
30-34	29	29.0
35-38	8	8.0
Mean $\pm$ SD	29.5 $\pm$ 4.4	
Range	(20-38)	

**Table 2:** Distribution of the study subjects by gestational age (N=100)

Gestational age (Weeks)	N. of Patients	Percentage
34-37	83	83.0
38-40	17	17.0
Mean $\pm$ SD	36.2 $\pm$ 1.5	
Range	(34-40)	

The gestational age ranged from 34 to 40 weeks and maximum number was found in the gestational age group of 34-37 weeks with mean ( $\pm$ SD) gestational age was 36.2 $\pm$ 1.5 weeks.

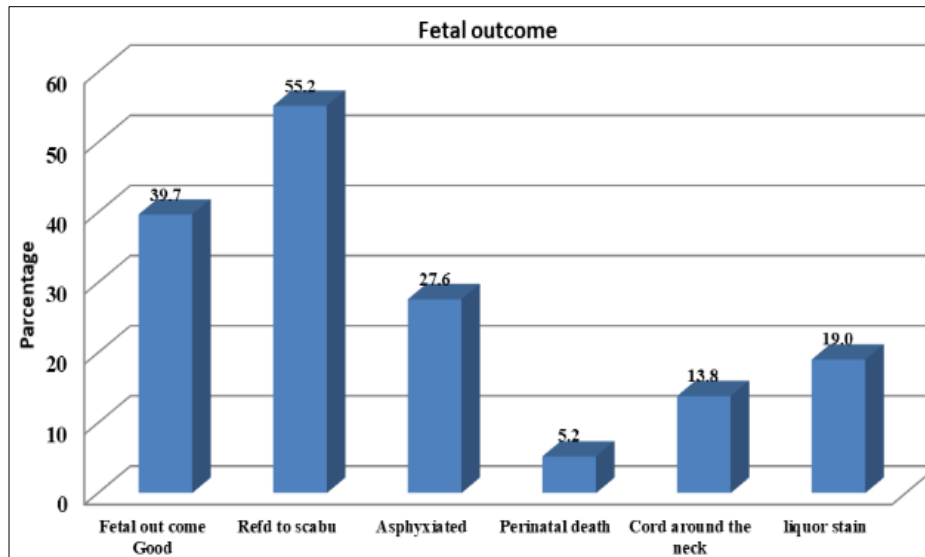


Fig 1: Bar diagram showing the fetal outcome of the patients.

Table 3: Mode of delivery of study subjects (N=58)

Mode of delivery	No of Patients	Percentage
Vaginal delivery	4	4.0
Caesarean section	54	54.0

A total of 100 patients were included in this study, out of which 58(58.0%) cases underwent termination and rest 42 (42.0%) received conservative treatment. Majority (54.0%) of the terminated patients underwent caesarean section and 4(4.0%) normal vaginal delivery.

Table 4: Biophysical profile score of the study subjects (N=100)

Investigation (BPP)	No. of patients	Percentage
<b>Underwent termination</b>		
Abnormal (4-5)	7	7.0
Equivocal (6-7)	35	35.0
Normal (8-10)	16	16.0
<b>Conservative treatment received</b>		
Normal (8-10)	42	42.0

According to biophysical profile score 4 to 5 was considered as abnormal, 6 to 7 considered as equivocal and 8 to 10 considered as normal. All of the patients who received conservative treatment had normal biophysical profile score, although 16 (16.0%) of the patients with normal biophysical profile score underwent termination, due to other indication (APH, previous c/s with scar tenderness and malpresentation). The results are shown in the table 4.

Table 5: Association between fetal outcome with biophysical profile score (N=58)

Fetal outcome	Abnormal (N=7)		Equivocal (N=35)		Normal (N=16)	
	N	%	N	%	N	%
Good	0	0	8	22.9	15	93.8
Refd to scabu	5	71.4	26	74.3	1	6.3
Asphyxiated	1	14.3	15	42.9	0	0.0
Cord around the neck	2	28.6	6	17.1	0	0.0
Liquor stain	4	57.1	6	17.1	1	6.3
Perinatal death	2	28.6	1	2.9	0	0.0

According to abnormal biophysical profile score it was found that 5 (71.4%) were referred to scabu, out of which 1 (14.3%) asphyxiated, 2 (28.6%) cord around the neck, 4

(57.1%) liquor stain and 1 (2.9%) perinatal death. According to equivocal biophysical profile score 8(22.9%) fetal outcome were good and 26(74.3%) referred to scabu, out of which 15(42.9%) asphyxiated, 6(17.1%) cord around the neck, 6(17.1%) liquor stain and 1(2.9%) perinatal death. The results are shown in the table 5.

## Discussion

A perception of reduced fetal movements is a common complaint by pregnant women. As part of routine antenatal care for many years pregnant women have been advised to note fetal movements in the third trimester. A reduction in fetal movement may be physiological, such as during the latter half of pregnancy or during fetal sleep states but it may be a sign of impending or existing pathology. It was first recommended in 1973 as a non-specific early warning sign of fetal distress [4], and since then, reduced fetal movements have been linked to both intrauterine and postpartum pathology [11, 12]. It may also result from maternal subjective difficulty in appreciating fetal activity. It is known that up to 87.0% of fetal movements are accurately perceived simultaneously by the mother when recorded using an external electromagnetic device [4], and that major body movements are more easily detected by these mothers [13]. It is quite important to note that in a small percentage of women, a pathological cause may be found. Therefore, a thorough ultrasound evaluation is recommended in all cases. This cross sectional study was carried out with an aim to evaluate the patient presenting with less fetal movement by sonography. To determine the outcome of pregnancies and to see neonatal outcome. A total of 100 singleton pregnancy gestational age  $\geq 34$  weeks, with less fetal movement, intact membrane with no labor pain were included in the study, in the department of obstetrics and Gynaecology in Dhaka Medical College Hospital during July 2009 to December 2009. The present study findings were discussed and compared with previously published relevant studies. Saastad *et al.* [14] have shown in their series, the more than one third (34.4%) incidence belonged to age 30 to 34 years age group. which is little higher with the current study. The mean age was  $29.5 \pm 4.4$  years ranged from 20 to 38 years. Sinha *et al.* [15] have shown in their series, the mean age of the patients was 28 years which closely resemble with the current study. In

this current study it was observed that the mean ( $\pm$ SD) gestational age was  $36.2\pm 1.5$  weeks ranged from 34 to 40 weeks and maximum number was found in the gestational age group of 34-37 weeks. Sinha *et al.* [15] observed most of the patients were 34 to 37 weeks of gestation, which is consistent with the current study. Heazell *et al.* [16] observed almost similar findings in their study, which is comparable with the present study. On the other hand, Skornick-Rappaport *et al.*, had observed higher mean gestational age in their study which were 39.3 and 39.1 weeks respectively. The presenting complaints of the study patients were found lower abdominal pain, history of sub fertility, history of previous c/s, dysuria and BOH. O'Sullivan *et al.* (2009) [17] observed almost similar complaints in their study. Tveit *et al.* [18] observed decreased fetal movement was 51.0% in Primi Gravida, which is comparable with the current study. Similarly, Saastad *et al.* [14] have observed identical findings in their study. Regarding the parity, it was observed that 47.0% were Primi Gravida and grand multipara (para 4/more) 8(8.0%) in this present study. It was observed in this study that 45(45.0%) patients received antenatal checkup Sinha *et al.* [15] found more IUGR babies with high caesarean section rates in their study group, where they showed 72.0% and 68.0% underwent caesarean section, which is comparable with the current study, where the present study found 54.0% patients underwent caesarean section and 42 (42.0%) received conservative treatment. However, the rate of intervention during labour was more. According to biophysical profile score it was observed in this study, the patients who had equivocal (35.0%) and abnormal (7.0%) biophysical profile score were terminated. Majority (58.0%) of the patient had normal (8-10) biophysical profile score, out of which 16.0% were terminated due to other indication (APH, previous c/s with scar tenderness and malpresentation) and 42.0% received conservative treatment. An evaluation of the perinatal mortality associated with a normal biophysical profile score revealed that 66.6% were due to congenital anomalies, 7.5% severe Rh disease, and 25.9% were structurally normal fetuses [19]. In a more recent study Dayal (1999) determined the cause of stillbirth in 27 structurally normal fetuses that had a normal biophysical profile score within 1 week of fetal demise. In this study it was found that 5(71.4%) were referred to scabu, out of which 1(14.3%) asphyxiated, 2(28.6%) cord around the neck, 4(57.1%) liquor stain and 2(28.6%) perinatal death, those who had abnormal biophysical profile score. Good fetal outcome observed 22.9% in equivocal biophysical profile score and 26(74.3%) referred to scabu, out of which 15(42.9%) asphyxiate, 6(17.1%) cord around the neck, 6(17.1%) liquor stain and 1(2.9%) perinatal death. According to normal biophysical profile score 15(93.8%) outcome was good, 1(6.3%) referred to scabu due to liquor stain. A study by Harrington *et al.* [20] failed to demonstrate that there was an association of reduced fetal movement with poor neonatal outcome.

### Conclusion

Low Biophysical profile scoring in proportionately associated with the poor outcome of neonates. BPP scoring helps the clinician to take decision for elective delivery of subjects & future planning of neonatal resuscitation. A reduction in fetal movement may be subjective, but it may be sign of impending or existing pathology. So all the subjects with less fetal movement should be evaluated with

biophysical profile. Those subjects with good (8-10) BPP should be given assurance. Those with low (<6) BPP should be Screened further.

### Conflict of Interest

Not available

### Financial Support

Not available

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