

CORRELATION OF BUBBLE STABILITY TEST WITH BIRTH WEIGHT AND DUBOWITZ SCORE FOR FOETAL MATURITY

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SUMMARY

It was found that at or below 34 weeks gestation, 100% had maturity score less than 20. Above 36 weeks of gestation 96.5% of the babies had a maturity score above 25, and above 38 weeks, 100% babies had a score above 25. Above 40 weeks, 100% infants had maturity score 30 or above.

There was no negative bubble stability test after 36 weeks of gestation. A positive result of the test is highly suggestive of a term infant as it was positive in 93.02% of the cases above 38 weeks. Positive results are associated with no risk of respiratory distress syndrome. Therefore, positive results are of definite value, but with negative results there are many 'false positive'.

Introduction

In recent years there has been increasing interest in the assessment of gestational age in the new born infant and in differentiating short gestation from the small for date infant, particularly when the expected date of confinement is uncertain. In view of the fact that the respiratory system is the most critical organ for the maintenance of existence, efforts are made to evaluate its maturity.

Clements *et al* (1972) devised the bubble stability test which is based on the presence of the pulmonary surfactant in the amniotic fluid. It increases after 34

weeks of gestation, thereby reflecting the foetal lung maturity.

In the present study, bubble stability tests is correlated with birth weight and maturity score described by Dubowitz and Dubowitz (1970), which reflects the total development, in particular the development of central nervous system. They showed that Dobowitz scoring gives an accurate estimation of gestational age.

Material and Methods

The present study includes 99 mothers and 100 new born babies as there was one set of twins and all were born by normal vaginal delivery. The patients were divided into 2 groups—(a) Control in whom the period of gestation was

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known. (b) Study group of 25 patients with unknown gestational period.

The age of patients was between 15 years and 37 years. Majority of patients belong to low socio-economic status.

Observations

In the present study Bubble stability test was performed on 100 samples of amniotic fluid collected by low rupture of membranes. In 11 infants, the Bubble Stability test on amniotic fluid was negative. In 70 cases, the test was positive and in 19 cases, it was intermediate.

Eleven infants with negative Bubble Stability test, were premature by gestation, weight and clinical and maturity score assessment described by Dubowitz and Dubowitz (1970). (Table 1).

Dubowitz scoring was done in 75 babies with known gestational period and in 25 babies with unknown period of gestation within 2 hours after birth (Table II).

TABLE I

Sr. No.	Period of gestation	No. of infants with negative Bubble stability test
1.	34 weeks or below	10
2.	35-36 weeks	1

Out of 18 babies, 5.55% (One baby below 36 weeks of gestation calculated by Naegle's rule had positive bubble stability test and none below 34 weeks showed positive bubble stability test. Also, there was no negative bubble stability test after 36 weeks. A positive result of the test is highly suggestive of a term infant as it was positive in 95.34% (41/43) of cases above 38 weeks. (Table III).

Negative bubble stability test is highly suggestive of birth weight below 2000 gms and positive results suggestive of birth weight above 2500 gms. Intermediate tests are not predictive of birth weight. (Table IV).

TABLE II
Comparison of Period of Gestation with Maturity Score in Control Group

Sr. No.	Period of gestation in weeks	Number	Maturity score		
			20	20-30	30
1.	34	9	9 (100%)	0	0
2.	35-36	9	1 (11.11%)	8 (88.88%)	0
3.	37-38	14	0	8 (57.15%)	6 (42.85%)
4.	39-40	35	0	2 (5.71%)	33 (94.28%)
5.	Above 40	8	0	0	8 (100%)

TABLE III
Bubble Stability Test in Relation to Period of Gestation

Sr. No.	Period of gestation in weeks	No. of samples	Bubble Stability test		
			Negative	Intermediate	Positive
1.	34	9	8 (88.88%)	1 (11.12%)	0
2.	35-36	9	1 (11.11%)	7 (77.78%)	1 (11.11%)
3.	37-38	14	0	4 (28.57%)	10 (71.42%)
4.	39-40	35	0	2 (5.71%)	33 (94.29%)
5.	Above 40	8	0	0	8 (100.0%)

TABLE IV
Bubble Stability test in Correlation with Birth Weight

Sr. No.	Bubble Stability test	No. of samples	Birth weight in Grams		
			2000	2000-2500	2500
1.	Negative	11	10 (90.91%)	1 (9.09%)	0
2.	Intermediate	19	3 (15.79%)	7 (36.84%)	9 (47.37%)
3.	Positive	70	1 (1.43%)	3 (4.23%)	66 (94.34%)

Bubble Stability test was also studied in relation to Maturity score of the new born. A positive test was found to be statistically significant. It was found that 82.85% (58/70) of infants had maturity score of 30 or above at birth. Rest of all had score 17.15% (12/70) varying between 20-30 (Table V).

tive caesarean section is contemplated or termination of pregnancy is considered in toxemia, Rh-incompatibility, diabetes mellitus, intrauterine growth retardation, etc. In recent years, there has been increasing interest in differentiating short gestation from the small for date infant. Gluck *et al* (1971) have described a

TABLE
Bubble Stability Test in Relation with Maturity Score

Sr. No.	Bubble Stability test	No. of samples	Maturity Score		
			20	20-30	30
1.	Negative	11	11 (100%)	0	0
2.	Intermediate	19	3 (15.78%)	15 (78.95%)	1 (5.26%)
3.	Positive	70	0	12 (17.15%)	58 (82.85%)

All the new borns in the present study were followed upto time of discharge from the hospital. Any rise in respiratory rate or recession of the chest cage was recorded as positive respiratory problem.

Out of 11 babies, who had negative Bubble Stability test, 63.63% (7) babies had respiratory distress syndrome and all died; 18.18% (2) babies died due to aspiration pneumonia and 18.18% (2) babies had no respiratory problem. Out of 70 cases with positive Bubble stability test, none developed respiratory problem.

Discussion

Bubble Stability test is of value in establishing maturity of foetus where elec-

method of amniotic fluid analysis utilizing the lecithin sphingomyelin ratio (L/S ratio) to predict the foetal lung maturation. The production of surfactant occurs in the alveolar lining of the foetal lungs and provides the lung with alveolar stability by 34-36 weeks of gestation. The foetal pulmonary fluid contributes to the amniotic fluid and thus the amniotic fluid surfactant content reflects the degree of lung maturation. A deficiency of surfactant exists in neonates with respiratory distress syndrome.

Maturity scoring described by Dubowitz and Dubowitz (1970) is based on 10 neurological and 11 external criterias, full score being 35 for each. The mean of

two scores was taken. The combined score is considered more reliable than one alone.

References

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SUMMARY

Biophysical changes were studied in 25 pregnant women. The women were divided in 3 groups. Group I—included 25 women at term (38-41 weeks gestation). Group II—included 25 women laboring for 1 to 2 hours. Group III—included 25 women in whom labor had lasted for 20 hours or more. No statistically significant difference could be detected in fetal weight, head size, chest circumference, umbilical cord pulsation, resistance and minor specific tests between groups I and Group II. The Group II patients in early labor showed statistically significant hypotension ($P < 0.05$). A statistically significant difference in fetal heart rate was observed between Group III and Group I ($P < 0.05$). A significant change in blood pH and a significant fall in pO₂ were observed ($P < 0.05$).

is progressing very slowly despite the most careful supervision both by the nurse and the medical attendant. Such patients should always be considered to be a hazard, because it is difficult to give after the 500-ml. which may give. The present study was carried out to give the same basis for important care for women in prolonged labor.

Introduction
In many tropical and developing countries including India the incidence of prolonged labor is quite high. The incidence of prolonged labor has been reported to be 10-15% in the tropics. The present study was carried out to give the same basis for important care for women in prolonged labor.

Biophysical changes were studied in 25 pregnant or parturient women in the Obstetrics and Gynecology Department of...

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