

ACCELERATED CLOTTING TIME AS AN INDEX FOR FETAL MATURITY

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SUMMARY

In the present study 126 samples were studied and it could be shown that an ACT of greater than 117 seconds indicated premature fetus (less than 34 weeks) and an ACT less than 51.9 seconds indicated fetus of above 40 weeks usually a postdated fetus. Because of simplicity and rapidity of test it is of significant value in managing certain complications of pregnancy and making decisions for timely termination of pregnancy for the safe survival of infant ex-utero.

INTRODUCTION

Correct timing of delivery to avoid complications of prematurity or of suspected postdated pregnancy and proper timing of terminating of high risk pregnancies has remained a major obstetrical problem. Amniotic fluid has been vastly studied for assessment of fetal maturity. As term approaches, increasing content of the phospholipids and thromboplastin from desquamating and degenerating fetal cells, in amniotic fluid leads to increase

in thromboplastin activity (Hastwell, 1974). A bed-side test has been evaluated, whereby an amniotic fluid sample was added to a sample of the patient's blood and thereafter observing accelerated clotting time.

Gestation increases thromboplastin activity of amniotic fluid and clotting time decreases. Present study is based on this principle to find out foetal maturity and its correlation with ACT by using amniotic fluid.

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Accepted for Publication on 04.01.94.

MATERIAL AND METHODS

This study was carried-out in 126

patients attending Maharani Laxmi Bai Medical College and Hospital, Jhansi, for confinement (both normal and abnormal pregnancy) in a period of 12 months. Careful history taking and clinical examination was performed and amniotic fluid was obtained during labour, abdominal amniocentesis or LSCS prior to rupture of membranes in sterile syringe.

Method used for Determination of Accelerated Clotting Time and Control Clotting Time as suggested by Hastwell (1974)

A sample of blood was rapidly drawn from patients cubital vein and 1.5 ml was added immediately to 1 ml of fresh amniotic fluid at body temperature viz 37°C. The temperature was maintained by immersing the collection tube in a waterbath. Meconium and Blood Stained Liquor sample was discarded. The clotting time was noted, the tube being tipped on to its side every 5 seconds. This time was termed as accelerated clotting time.

A control clotting time was obtained by placing 2.5 ml of the same sample of blood into a similar tube and noting the whole blood clotting time in the same manner. If the control was between 3 and 6 minutes, the conditions of the test were considered satisfactory.

OBSERVATIONS

There was a linear fall in ACT as the duration of gestation increases. In group I, the period of gestation varied between 28 and 32 weeks and the range of ACT was between 130 and 200 seconds. Average ACT was 169.6 seconds with SD 22.4. In group II, where the period

of gestation varied between 32-36 weeks, the range of ACT was between 96 and 145 seconds and average was 117.67 seconds with SD 15.03.

In group III where the period of gestation varied between 36 and 40 weeks, the range of ACT was between 50 and 112 seconds and mean was 80.44 seconds with SD 17.05 seconds.

Comparing these three pairs of data, it is seen clearly that as the gestational age increased, there was clear fall in ACT. Further by simple analysis (Table I), ACT of 98 or less can be taken as an index of foetal maturity ($p < 0.001$ i.e. highly significant).

In group IV, where the period of gestation was 40 to 42 weeks, the range of ACT was 46 to 68 seconds and average was 51.9 seconds with SD 16.1.

In group V, where the period of gestation was 42 weeks or more the ACT ranged between 44-54 seconds and mean was 48 seconds with SD 5.29.

By analysing this data statistically, we see that after 40 weeks with continuing pregnancy, there is clear fall in ACT which is statistically significant.

It can be inferred that there is linear fall in ACT as the gestation increases and value of 51.9 seconds is significant to show that fetus is above 40 weeks but after that though the ACT still falls it is not very significant. Hence, the value of ACT is to detect a post-dated pregnancy but it will not differentiate a post-mature fetus, from post-dated one.

DISCUSSION

In the present study, there was a significant decrease in ACT (Accelerated

Table I

Group	Period of gestation (in weeks)	No. of cases	Range of ACT (Secs.)	Average ACT (Secs.)	SD	Statistical comparison		
						Comparison between groups	't' value	'p' value
I	28-32	20	130-200	169.60	22.20	I & II	6.99	< 0.001
II	32-36	25	95-145	117.67	15.03	I & III	12.57	< 0.001
III	36-40	35	50-112	80.44	17.50	I & IV	14.68	< 0.001
IV	40-42	33	46-68	51.90	16.09	I & V	9.434	< 0.001
V	42 and above	13	36-48	46.00	5.29	II & III	6.87	< 0.001
						II & IV	11.20	< 0.001
						II & V	8.13	< 0.001
						III & IV	4.89	< 0.001
						III & V	3.29	< 0.01
						IV & V	6.42	< 0.05

Clotting Time) with advancing pregnancy. The decrease in ACT suggests an increase in thromboplastic activity in amniotic fluid and increasing gestational age. Similar findings have also been reported by Hastwell (1974 and (1978). Karna (1984) suggested ACT of 115 seconds or less can be taken as index of foetal maturity. In the present series of 98 seconds or less can be taken as index of foetal maturity i.e. gestational age of more than 36 weeks.

The diagnosis of post-maturity remains a difficult problem. The thromboplastic activity of amniotic fluid (TAAF) increases with the gestational age. Based on this phenomenon, Yaffe et al (1981) reported that TAAF values of less than 42 seconds strongly suggested post-maturity. Pregnancy in which the TAAF values is between 42-45 seconds should be regarded as post-mature and high risk and TAAF of 45 seconds or more is not compatible with fetal post-maturity. In this study also, we found ACT of below 46 seconds were associated

with post-mature foetus. Thus enhancing the value of this test over other tests for maturity of the foetus.

The present study has clearly demonstrated an increase in procoagulant activity in the amniotic fluid as was also known by decrease in CT (Clotting Time).

CONCLUSION

It can be concluded that ACT can be used to detect foetal maturity more particularly post-datism. Therefore, this information can be used for induction of labour and termination of pregnancy where a decision is to be taken that a point has been attained where infant survival and development may be more safe in a nursery than in utero.

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