PHENOLIC COMPOUNDS IN AMNIOTIC FLUID TO ASSESS FOETAL MATURITY†

by

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Introduction

Assessment of foetal maturity plays an important role to decide the line of management in abnormal and complicated pregnancies. Amniotic fluid has been studied in the past to find out the foetal maturity. The biochemical parameters studied include, creatinine, lecithin-sphingomyelin ratio, alkaline phosphatase, peroxidase and proteolytic activity etc. The present study was undertaken to examine if the total phenolic compounds in amniotic fluid have any relationship with the period of gestation.

Material and Methods

Amniotic fluid was collected from 47 pregnant women admitted at Government General Hospital, Kakinada for transabdominal amniocentesis. Care was taken to avoid contamination and only fluids free from blood and meconium were included. The gestational age was calculated from the morphological and neurological examinations of the new borns within 2 days of birth (Koenisberger, 1966). The distribution of patients according to period of gestation were shown in Table I.

TABLE I

Distribution of Cases According to Period of Gestation

Group	Period of Gestation	No. of cases
Group I	28 to 36 weeks	12
Group II	37 to 40 weeks	19
Group III	Above 40 weeks	16
	Total	47

The substances which reacted with alkaline Folin Ciocal teu reagent were labelled as phenolic compounds. 0.5 ml of centrifuged amniotic fluid and 2 ml. of distilled water was deproteinised with 0.5 ml of 10% trichloracetic acid. One ml of the supernatent was treated with 1 ml of Folin-Ciocalteu reagent (Folin-Ciocalteu, 1927) and 5 ml of 2% sodium-carbonate. The optical density was determined after half an hour at 630 mu in a photoelectric colorimeter against a

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blank, similarly prepared with 10% trichloracetic acid. The phenolic compounds were expressed in micromoles tyrosine per ml of amniotic fluid.

Observations

The observations are summarised in the Table II.

TABLE II

Phenolic Compounds in Various Periods of Gestation

Group	No. of cases	Phenolic compounds micromoles Tyrosine/ml Mean ± SEM
I	12	0.9 ± 0.1
II	19	1.6 ± 0.07
III	16	2.35 ± 0.13

Discussion

Phenolic acids were demonstrated in amniotic fluid by Saini *et al* (1976). Their study supported the hypothesis that in the first half of pregnancy amniotic fluid is an ultrafiltrate of plasma and later on it assumes the characteristics of dilute foetal urine. As far as could be ascertained from the available literature, no study seems to have been done on phenolic compounds to assess the foetal maturity.

In the present work, the pregnant women were divided into 3 groups. Group I (less than 37 weeks), Group II (37-40 weeks) and Group III (more than 40 weeks) represents prematurity, maturity and postmaturity respectively. The progressive rise of total phenolic compounds in the 3 groups with good statistical significanc is a notable observation. As number of cases for each week of gestation are not more, it was not attempted to correlate the values with the gestational week. The increased concentration with the period of gestation might be due to the progressive development of the foetal renal excretary system.

This preliminary work indicates that phenolic compounds concentration in amniotic fluid could be taken as one of the biochemical parameters to assess foetal maturity. However, an extended work with more number of samples and improved procedure involving extraction of phenolic compound is required before recommending this parameter to the routine clinical laboratory work.

Summary

Forty-seven samples of amniotic fluids drawn from pregnant women of different periods of gestation were analysed for the concentration of phenolic compounds. The substances which reacted with alkaline Folin-Ciocalteu reagent were labelled as 'phenolic compounds' and expressed as micromoles of tyrosine per ml of amniotic fluid. The results showed a progressive increase in the concentration of phenolic compounds with period of gestation. The significance of phenolic compounds concentration in amniotic fluid as a parameter to assess the foetal maturity is discussed.

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