

However, interesting vistas have been opened by the work of Willgerodt *et al.* <sup>(1)</sup> regarding serum acetylcholine esterase in women before and after treatment with oestrogens and progestogens. These authors observed, in some of the women, a considerable fall of choline esterase activity, but in the majority of cases the values did not reach pathological limits. However, the values encountered were always less than those obtained before treatment. These authors attributed this phenomenon to possible interference at hormonal level. It is also known that the oestrogens have an anticholinesterase activity *in vitro*, even if it is not possible to demonstrate this with any certainty *in vivo* <sup>(8)</sup>. It may, therefore, be concluded that the synthesis of acetylcholinesterase in the liver, as shown by the plasma concentration, is diminished during pregnancy probably due to hormonal causes, without reaching a true state of liver dysfunction, in which this phenomenon becomes more evident.

### SUMMARY

The serum concentration of acetylcholine esterase was studied at various gestational ages; a significant diminution, particularly from the 5th to the 8th month of pregnancy, is attributed to hormonal causes that regulate biosynthesis of the enzyme in the liver.

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## The problem of foetal maturity during iso-immunization due to the Rh factor

by

M. MEGA\*, A. RABASSO\*, G. DE LAURENTIS\*\* and E. LAURETI\*

We carried out an investigation with a view to assessing the practical significance of the ordinary tests for foetal maturity, in the presence of a moderately or highly serious situation of materno-foetal iso-immunization due to the Rh factor.

\* From the Obstetric & Gynaecological Clinic, University of Padua.

\*\* From the Chair of Obstetric & Gynaecological Pathology, University of Padua.

## MATERIAL AND METHOD

We analysed creatinine, urea, uric acid, total proteins and lecithin, and carried out the Clements Test, on 140 samples of amniotic fluid from 97 iso-immunized women. All these tests were made in the Obstetric and Gynaecological Clinic of the University of Padua between October 1968 and February 1972, by trans-abdominal amniocentesis, at stages of pregnancy between the 21st and 40th week.

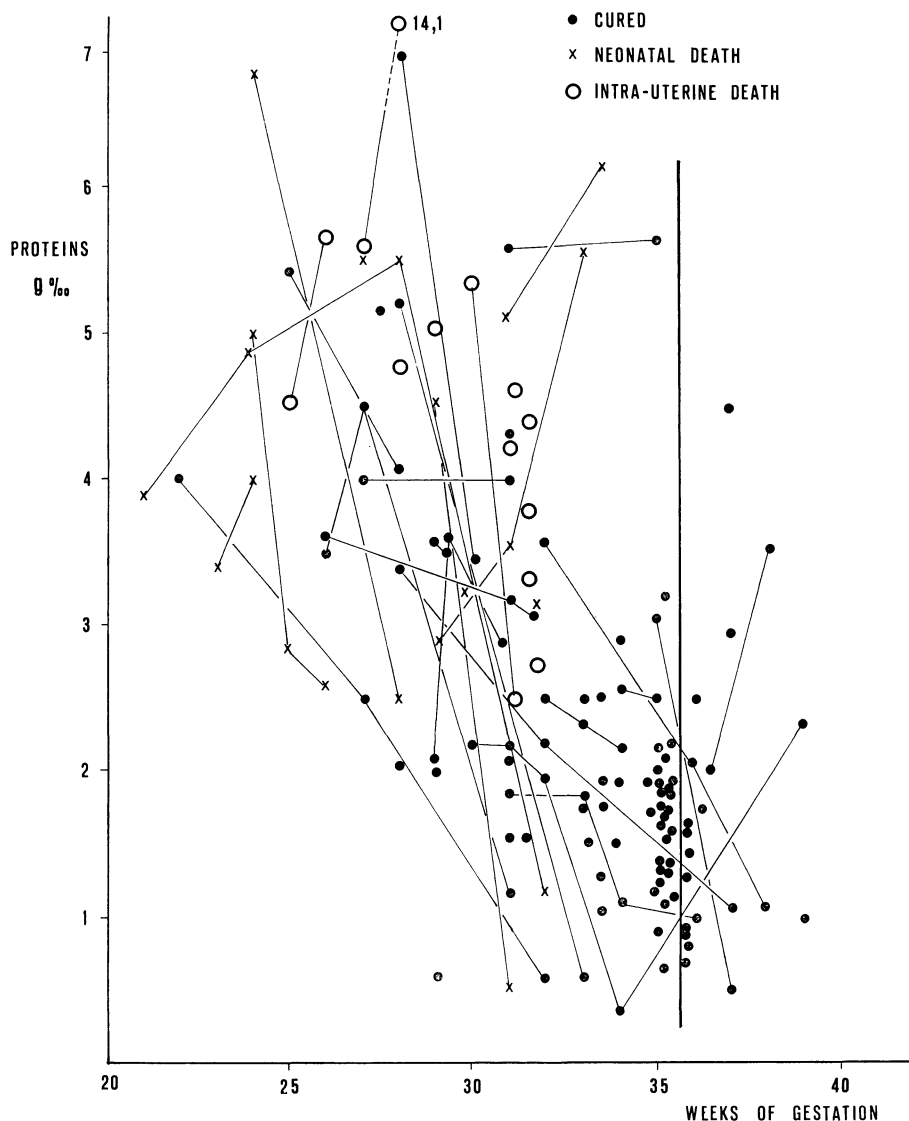


FIG. 1 - The protein values in the amniotic fluid as pregnancy progressed.

RESULTS

The results obtained from analysis of the proteins in the amniotic fluid are listed in Fig. 1.

Examination of the graph shows a gradual fall in the protein values as pregnancy progressed. This diminution was confirmed in almost all the cases that terminated satisfactorily; in the cases of neonatal mortality, the protein values were on average higher as compared to the mean of cases that progressed satisfac-

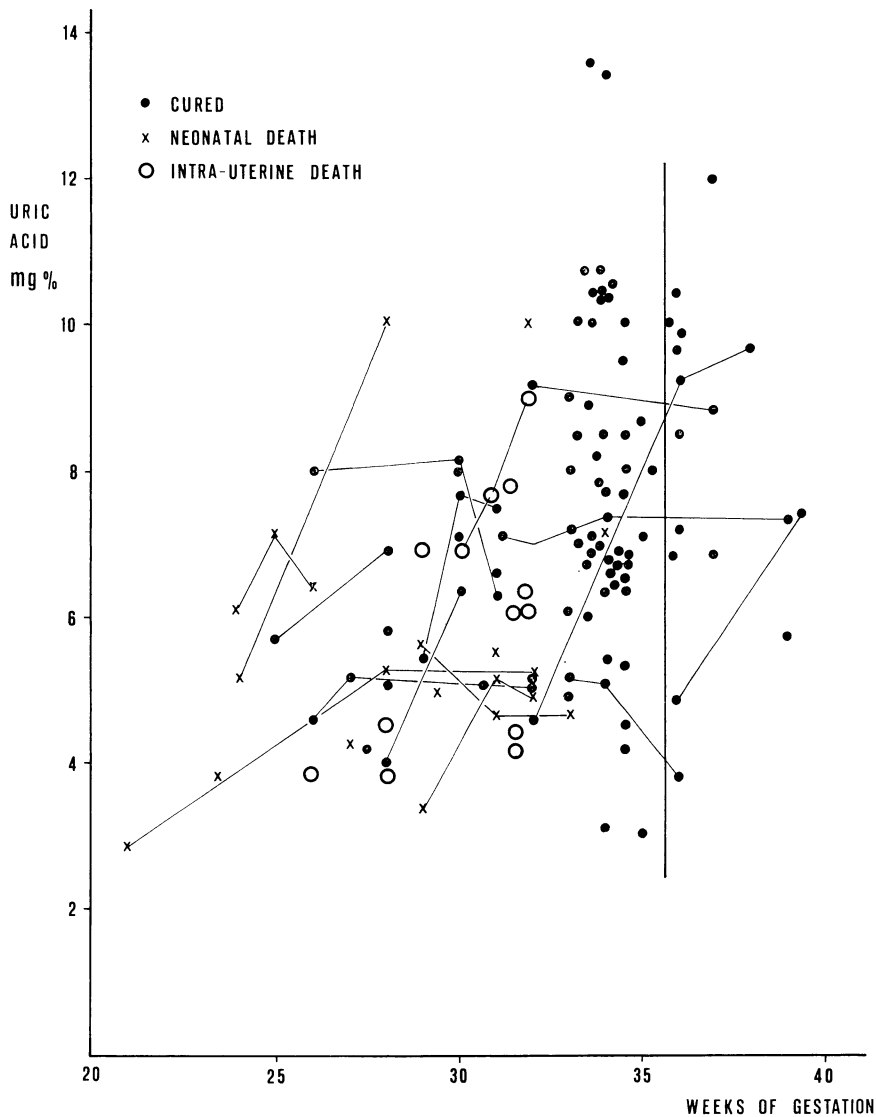


FIG. 2 - The values of uric acid in the amniotic fluid as pregnancy progressed.

torily; in the 6 cases of neonatal mortality followed by means of serial samples, the progress of the graph showed a gradual fall in 3 cases, while in the other 3 the proteins showed a gradual increase.

The 11 cases of greater seriousness, which ended in the intra-uterine death of the foetus, showed mean values for the proteins that were above normal; in the 3 serial analyses available to us, we found quite contrasting behaviour; in the 1st case there was a marked fall in the values, with behaviour analogous to the pregnancies that developed satisfactorily; in the 2nd case there was an increase; in the 3rd case there was an increase with a very high peak, due probably to maceration of the intra-uterine foetus.

The values obtained from analysis of uric acid are shown in Fig. 2.

Examination of the graph shows a wide dispersion of the values, both as regards the cases with a favourable prognosis, and as regards the neonatal deaths and intra-uterine deaths.

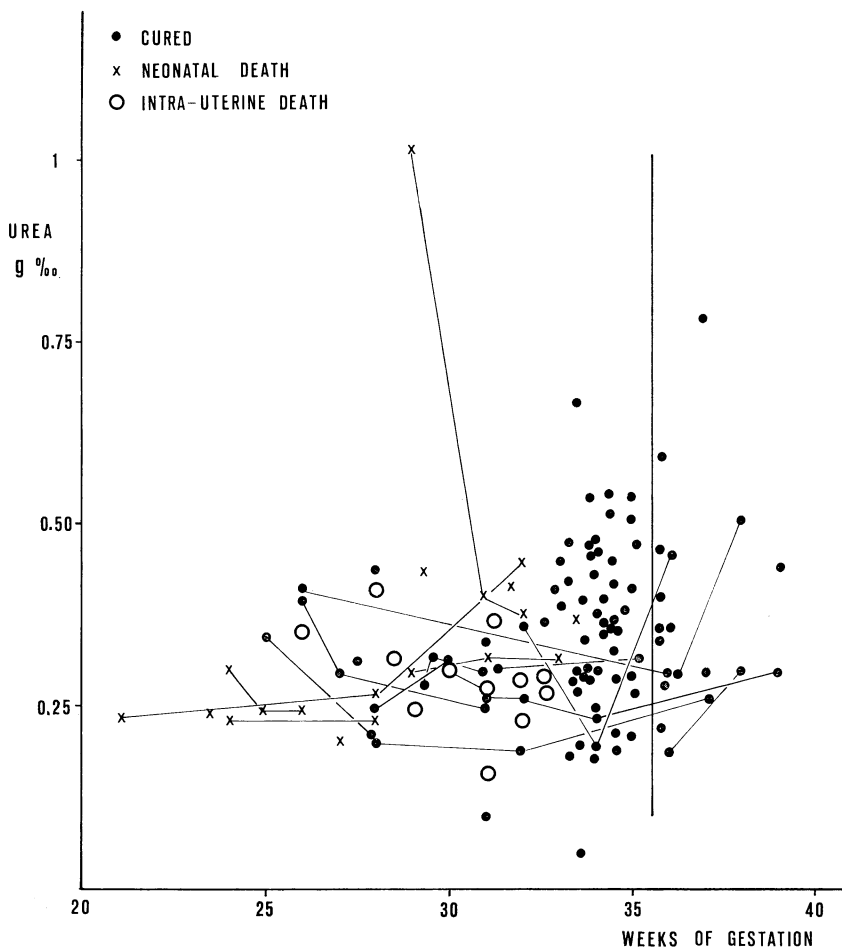


FIG. 3 - The values of urea in the amniotic fluid as pregnancy progressed.

On average, the cases that showed satisfactory progress seemed to give slightly higher values, but in every case not such as to have any practical diagnostic or prognostic significance on examination of the laboratory findings alone.

The values obtained from analysis of urea are shown in Fig. 3.

Examination of the data shows a very slight variation in the increase of values as pregnancy progressed; from the results obtained, no differences were noted between the cases that developed satisfactorily and the cases of intra-uterine death and neonatal death.

The results of the analysis of creatinine are listed in Fig. 4.

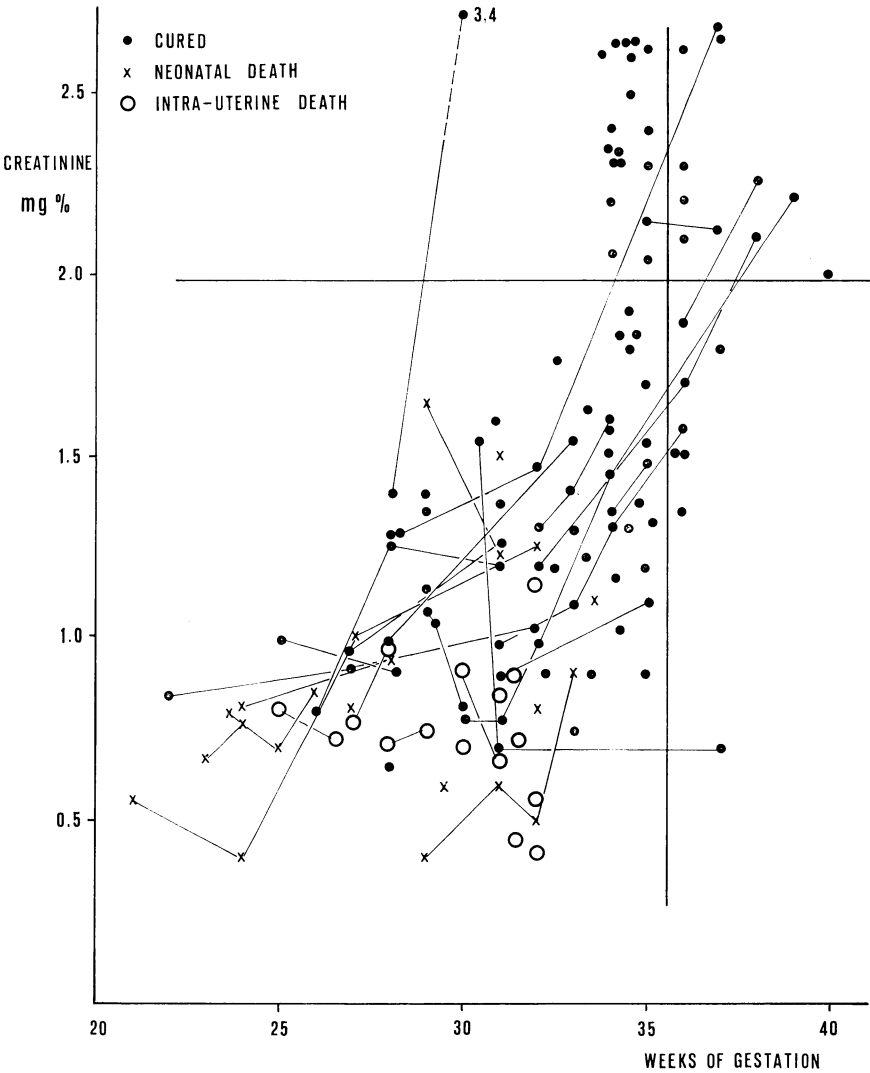


FIG. 4 - The values of creatinine in the amniotic fluid as pregnancy progressed.

Examination of the graph shows a progressive, significant increase in the values as pregnancy proceeded; this increase was still more evident when the cases with serial analyses were taken into consideration.

The cases of serious iso-immunization with intra-uterine death showed values that were markedly lower as compared with the cases of neonatal death, and with those that developed satisfactorily; as regards the prognostic significance of creatinine, there were no cases that progressed unsatisfactorily with values greater than 1.7.

The values for lecithin in relation to the period of pregnancy are listed in Fig. 5.

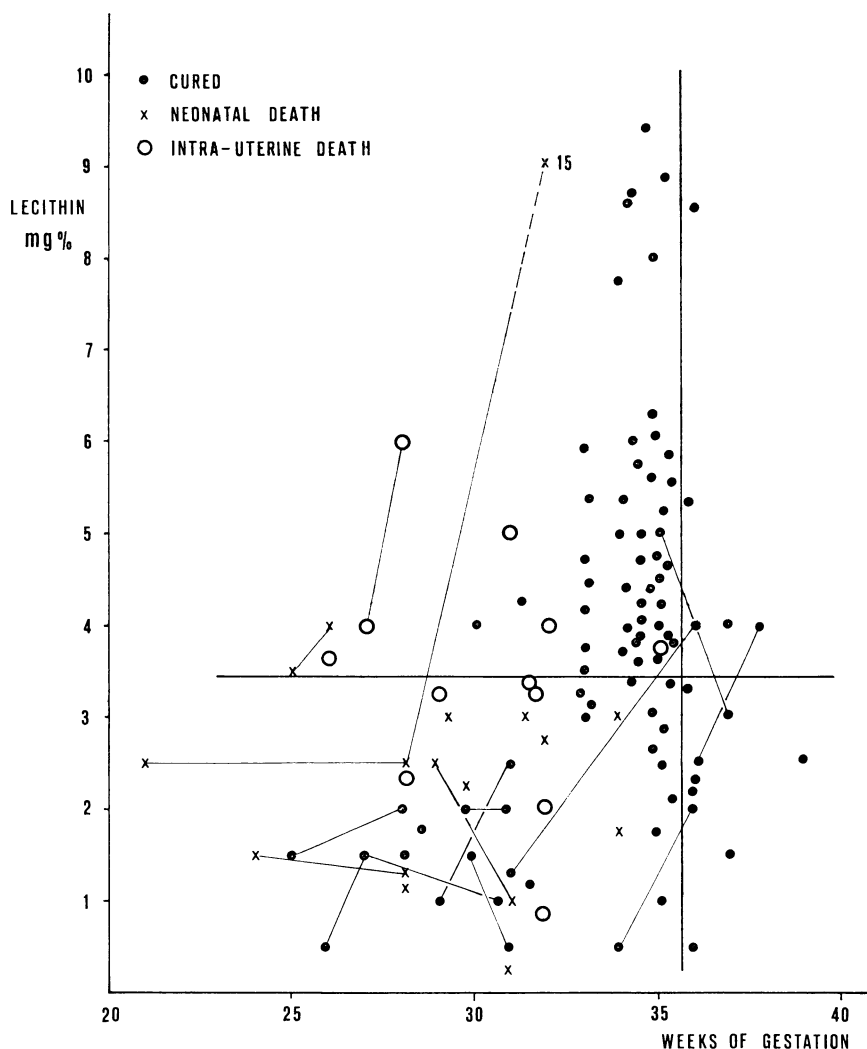


FIG. 5 - The values of lecithin in the amniotic fluid as pregnancy progressed.

Study of the graph shows a wide dispersion of values, a marked tendency to increase being evident around the 35th week.

The cases that progressed to intra-uterine death and neonatal death gave values that were markedly different from the cases that developed satisfactorily.

All the cases of neonatal death, with two exceptions, gave values for lecithin that were low for that period of pregnancy.

In five cases of intra-uterine death, the lecithin analysis gave markedly higher values than those considered normal for that period of pregnancy. In 12 cases, equivalent to 16% of the cases that developed satisfactorily, the values for lecithin were below 2 mg%.

The results of the Clements' test are shown in Table I.

Table 1. *The results of the Clements' test.*

Clement's Test	Intra-uterine death		Neonatal death		Living		Total
Negative	2	11.11 18.18	4	22.22 36.36	12	66.67 16.00	18
Dubious	4	16.66 36.36	5	20.83 45.45	15	73.51 20.00	24
Positive	5	9.09 45.45	2	3.63 18.18	48	87.28 64.00	55
Total	11		11		75		97

Examination of the data shows a clear parallelism between the results obtained with Clements' test and those obtained with the lecithin analysis.

In 12 cases, equivalent to 16% of the cases that developed satisfactorily, Clements' test gave a negative result, but it was positive in 2 cases (18.18%) out of the 11 of neonatal death, though in these cases the presence of meconium in the sample of amniotic fluid obtained could not be excluded.

The analyses that we found most useful were the creatinine and protein values and the Clements' test; but these determinations showed a relatively wide dispersion of values and a number of false positives and false negatives such as to make great prudence advisable in the clinical application of the results.

## DISCUSSION

The results obtained in analysing the proteins in amniotic fluid have demonstrated, in agreement with many other authors' results (<sup>9, 13, 15</sup>), that this parameter progressively diminished as pregnancy proceeds; however, we obtained very scattered values, which made evaluation by serial analysis very useful.

The gradual increase of the proteins in serial analyses seems to us to constitute a real index of deterioration of foetal conditions (<sup>9, 13, 15</sup>).

As regards uric acid and urea, the results had no validity, either as an index of foetal maturity, or as a sign of an affected foetus (<sup>6, 13, 15</sup>). As regards creatinine, the values obtained showed a significant rise as pregnancy proceeded (<sup>1, 3, 5, 6, 7, 13, 14, 15, 17, 18, 20</sup>); this parameter also proved to be a good index of the state of the intra-uterine foetus.

As regards lecithin, we did not have scattered values before the 35th week

of pregnancy, but there was a marked increase after that period, which to some extent is in agreement with other authors' results <sup>(2, 8, 10, 12, 16, 19)</sup>.

Clements' test has demonstrated parallel progress to the analysis of lecithin, so that the determination of this phospholipid could be substituted, in view of the advantages of cost and practicability.

### SUMMARY

Analyses of creatinine, urea, uric acid, total proteins and lecithin, together with the Clements' test, were carried out on 140 samples of amniotic fluid from 97 cases of iso-immunized women, admitted to the Obstetric and Gynaecological Clinic of the University of Padua between October 1968 and February 1972. The authors found a gradual diminution in the values for creatinine as pregnancy progressed; analysis of lecithin showed a marked increase in values after the 35th week, and Clements' test was shown to follow closely the variations of lecithin; as regards uric acid and urea, very scattered and thus not valid values were obtained.

The authors found that serial analysis gave more precise results, but in any case they advise great prudence in the clinical interpretation of results.

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