C3 degradation products (C3d) in normal pregnancy

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SUMMARY Plasma C3 degradation products (C3d) were measured in 65 normal pregnancies and compared with those of non-pregnant women. No significant difference was detected between the two groups, although a difference had been previously reported. Plasma C3d estimations give an indication of complement activation and may be used as an indicator of disease activity in patients with systemic lupus erythematosus (SLE), irrespective of pregnancy.

Systemic lupus erythematosus (SLE) predominantly affects women of child bearing age and is a classical immune complex disease in which hypocomplementaemia is a feature, but the hypocomplementaemia reflects not only complement activation but also hypoproduction.¹ Quantification of C3d, a product of C3 activation, by the alternative or classical complement pathways, gives an indirect measurement of complement activation. The concentration of C3d can be used as an indicator of lupus activity.^{2,3} The role of C3d estimations in the management of pregnant women with SLE was questioned by a report, which stated that pregnancy itself could increase complement turnover, thus producing high C3d concentrations.⁴ We therefore measured the concentrations in a group of pregnant women.

Material and methods

Sixty five women at various stages of pregnancy were randomly requested to give an extra sample of blood during routine venepuncturing at an antenatal clinic. Women with pregnancy complications or who were receiving drugs were not excluded. The edetic acid plasma was separated within six hours of venepuncture and stored at -186°C in a vapour phase liquid nitrogen container. A control group comprised 21 non-pregnant women and 18 men (age range 18 to 83 years).

C3d concentrations were measured using the double decker rocket immunoelectrophoresis method of Brandslund *et al.*⁵ Essentially, electrophoresis of $4\ \mu\text{l}$ edetic acid plasma was performed overnight ($2.5\ \text{V/cm}$) initially through a gel layer containing anti-human C3c (Dako) and then through a layer containing antihuman C3d (Dako) where the C3d rockets

were formed. After drying and staining the rocket heights of test samples and standards were measured and the C3d values calculated from a standard curve. The C3d concentration of the standard (normal serum incubated at 37°C for four days) was assigned an arbitrary value of 100 units/ml.

Results

Plasma C3d concentrations in the pregnant women were mean 8.2 (SD 2.3) units/ml. These values did not differ significantly from those found in controls (8.6 (2.3) units/ml) when the data were analysed using Student's *t* test ($t = 0.86$, $0.3 < p < 0.4$). The C3d concentration exceeded normal limits as defined by

Fig 1 C3d concentrations in a) 39 normal controls and b) 65 pregnant women.