Potent Anti-s in Pregnancy

John P. ORiordan and John Cann
Dublin, Ireland

In 1951, soon after Race and Sanger had predicted its finding, the first example of anti-s was reported by Levine and his co-workers1 who presented evidence to show its relationship to the S factor and its linkage to the MN system. The antibody which they described was immune in character and gave rise to Haemolytic Disease of the Newborn. Since then four additional anti-s sera have been described, all of immune origin and giving rise in a further instance to Haemolytic Disease2-4-5. The antigen s appears to be a poor stimulator of antibody and with the exception of that reported by Giblett5 the antibody has been of low titre in both saline and albumin or else was revealed by the indirect anti-human-globulin test. The value of anti-s in the field of genetics has been referred to by Race and Sanger6 since its use in conjunction with the other anti-sera of the MNSs system makes that blood group system the most discriminating of all.

In presenting this further example of anti-s the Authors purpose is to make a preliminary report on the finding of a particularly potent antibody with which they are currently conducting more comprehensive family and racial studies. Additionally,
it will be noted from the case record that although the antibody appears to
have arisen as an immune response to stimulation during pregnancy it did not give rise to overt Haemolytic Disease in the Infant.

Case Report

The serum of the patient Mrs. V. was first referred to our National Laboratory in June 1957 at the 30th week of pregnancy when a local hospital screening test showed the presence of an atypical antibody the subsequent identification of which is detailed below. Mrs. V. already had two children aged 3 and 2 years respectively, both of whom it appears were normal at birth and subsequently. There was no history of previous transfusion or other injection of blood. It was anticipated that the antibody present would give rise to Haemolytic Disease of the Newborn and arrangements were made by the hospital to cater fully for this eventuality. Notwithstanding the presence of the antibody Mrs. V. was duly delivered of a full-term clinically normal infant whose red cells were shown to possess the corresponding antigen. The direct anti-human-globulin test carried out on the babys cells at birth in the hospital laboratories was repeatedly negative and the baby has continued normal in all respects since birth.

Serological Report

The blood groups of the patient and her immediate family are detailed in table I.

Table I

Blood Groups of Patient and Immediate Family

Preliminary tests indicated that the antibody was antithetical to anti-S, a finding subsequently confirmed by Dr. Mourant at the Blood Group Reference Laboratory, London, and Dr. Dunsford at the Sheffield Centre of the British Transfusion Service. Their results are shown in table II.

Table II

Results of Tests with Serum from Mrs. V. Against Cells Previously Tested with Known Anti-s Sera

ORiordan and Cann, Potent Anti-s in Pregnancy
The probability of these results arising by chance is, in each case, less than 1 in 20,000. Evidence for the immune nature of the antibody is demonstrated in table III. This shows that there is an antibody giving stronger reactions at 37 G than at room temperature or 4 G. Reactions were enhanced by suspending the red cells in albumin and with trypsin treated cells but were not appreciably enhanced by the albumin replacement method. Unlike previously reported anti-s sera, the indirect anti-human-globulin test did not provide more sensitive results than those achieved in saline and the use of Lows cystein activated papain technique completely suppressed the activity.

Table III

Titration of Serum from Mrs. V. by Various Techniques at 3 Different Temperatures against Cells of the Type ss (Titration Scores are as Recommended by Race and Sanger7)

The dosage effect of homozygous and heterozygous genotypes which has been previously noticed is clearly evident with this serum and is most marked when serial dilutions are made in saline. This dosage effect was confirmed by titrations against 30 ss and 30 Ss samples.

The serum of Mrs. V. also contains a cold incomplete autoagglutinin having titres of between 16 and 64 against her own and other SS trypsin treated cells at 19 G. The serum weakly agglutinated the eldest childs cells and one other SS control at 37 G.

Comment

The example of the rare antibody, anti-s, now reported is in higher titre than any yet described. Its versatility in use, availability of supply and satisfactory retention of activity in storage to date make it a most valuable serum for serological studies of wide variety. A most interesting and significant feature of the case is the fact that despite the high titre of the antibody and the result of a survival study with Cr51 labelled cells conducted by Fudenberg and Allen3 which clearly showed the potency in vivo of their example of anti-s against incompatible cells, the baby in our case gave a negative anti-human-globulin test at birth and was clinically normal then and subsequently. This is to be expected if the maternal antibody consists entirely of complete agglutinin. The enhancement observed using albumin and

600 ORiordan and C ann, Potent Anti-s in Pregnancy

trypsin techniques might suggest the presence also of an incomplete antibody, presumably of the non-gamma-globulin type. Investigations to clarify this point are proceeding.
The presence of the cold incomplete autoagglutinin does not detract from the usefulness of this serum when tests are performed in saline or albumin at 37 C.

Acknowledgement: Our thanks are due to Tit. Douglas Mellon of the Serological Laboratory, Rotunda Hospital, Dublin, for referring the serum and making details of the case available.

References