

10 courses) and 81% (13 out of 16 courses) respectively. There were no side effects. Oral prednisolone was initially less effective (70% response) but roughly the same proportion of patients (85% or 16 out of 20 courses) reacted within three to four weeks, the delay being due to a slow response in three patients. The table shows the mean platelet counts in the three patient groups for those patients who reacted to treatment. The effect of intravenous corticosteroids was even faster than that of intravenous gammaglobulin, although the difference was not statistically significant.

Platelet count ( $\times 10^9/l$ ; mean (SD)) before and during treatment and with maintenance treatment

Drug	Day				
	0	3	5	7	10
Prednisolone	13 (14)	56 (31)	100 (42)	140 (64)	147 (47)
Methylprednisolone	20 (17)	100 (46)	146 (51)	158 (68)	120 (54)
Gammaglobulin	23 (13)	69 (74)	136 (44)	177 (149)	133 (51)

### Comment

Our study shows that high dose intravenous methylprednisolone is as effective as intravenous gammaglobulin in treating autoimmune thrombocytopenia; hence it may be considered a less expensive alternative. The effect of intravenous corticosteroids was transient in all our patients, as was that of intravenous gammaglobulin.<sup>5</sup> Maintenance treatment with a low oral dose of prednisolone (20-40 mg/day) was necessary to ensure a more lasting effect. In the long term oral prednisolone was as effective as intravenously administered corticosteroids. Hence this treatment is indicated only in patients with a severe bleeding tendency. It may also be used to prepare these patients for surgery.

- 1 Imbach P, Barandun S, d'Apuzzo V, *et al*. High dose intravenous gammaglobulin for idiopathic thrombocytopenic purpura in children. *Lancet* 1981;ii:1228-30.
- 2 Bussel JB, Hilgartner MW. The use and mechanism of action of intravenous immunoglobulin in the treatment of immune haematologic disease. *Br J Haematol* 1984;56:1-7.
- 3 Imbach P, Wagner HP, Buchtold W, *et al*. Intravenous immunoglobulin versus oral corticosteroids in acute immune thrombocytopenic purpura in childhood. *Lancet* 1985;ii:464-8.
- 4 Karpatkin S. Autoimmune thrombocytopenia. *Semin Haematol* 1985;22:260-88.
- 5 Vos JJE, Van Aken WG, Engelfriet CP, Von dem Borne AEGK. Intravenous gammaglobulin therapy in idiopathic thrombocytopenic purpura; Results with the Netherlands Red Cross Immunoglobulin Preparation. *Vox Sang* 1985;49:92-100.

(Accepted 16 September 1987)

Department of Haematology, Academic Medical Centre, University of Amsterdam and Department of Immunohaematology of the Central Laboratory of the Netherlands Red Cross Blood Transfusion Service

A E G K R VON DEM BORNE, MD, PHD, internist-haematologist  
 J J E VOS, MD, PHD, resident  
 J G PEGELS, MD, PHD, internist-haematologist  
 L L M THOMAS, MD, PHD, internist-haematologist  
 H VAN DER LELIE, MD, PHD, internist-haematologist

Correspondence to: Dr von dem Borne, Department of Immunohaematology, Central Laboratory of the Netherlands Red Cross Blood Transfusion Service, Plesmanlaan 125, 1066 CX Amsterdam, The Netherlands.

## Antenatal factors associated with obstruction of the gastrointestinal tract by meconium

Obstruction of the gastrointestinal tract by meconium in the neonate ranges in severity from the inspissated meconium syndrome, which may require an operation, to the meconium plug syndrome, which is a failure to pass meconium within the first 24 hours of life and which resolves spontaneously.<sup>1</sup> To identify the factors associated with the condition we examined the antenatal records of eight successive babies who were diagnosed as having meconium obstruction in the neonatal period.

### Patients and results

Obstruction of the gastrointestinal tract by meconium was diagnosed in only eight of 400 infants treated in the neonatal intensive care unit at this hospital over

12 months. All eight infants (six girls and two boys) had birth weights that were below the third centile. The mothers had been referred to this hospital at 24-30 weeks' gestation for assessment of severe intrauterine growth retardation.

The fetuses were physically and chromosomally normal; screens for toxoplasma, rubella, cytomegalovirus, herpes, and autoantibodies gave negative results. Abdominal circumferences were below the fifth centile of the normal range for gestation. Each fetus had a hyperechogenic bowel, defined as a mass with a similar echogenicity to the skeleton in the lower half of the abdomen between the liver and the bladder; each fetus also had oligohydramnios, as defined previously.<sup>2</sup> Doppler ultrasonography showed that the resistance index of the uteroplacental circulation was greater than the 95th centile of the normal range and that the mean velocity of blood in the fetal thoracic aorta was less than the fifth centile; end diastolic frequencies in the umbilical artery were absent.<sup>3</sup> Fetal oxygen tension was less than the fifth centile of the normal range for gestation.<sup>4</sup> The table shows the indications for delivery, the modes of delivery, and the birth weights.

### Data on delivery of fetuses with hyperechogenic bowel

Case No	Gestation at delivery (weeks)	Indication for delivery	Mode of delivery	Birth weight (g)
1	30	Hypertension induced by pregnancy	Caesarean section	950
2	35	Premature labour	Caesarean section	960
3	27	Abnormal biophysical profile	Caesarean section	540
4	28	Abnormal biophysical profile	Caesarean section	520
5	28	Abnormal biophysical profile	Caesarean section	680
6	27	Abnormal biophysical profile	Caesarean section	540
7	34	Hypertension induced by pregnancy	Caesarean section	1700
8	30	Premature labour	Caesarean section	450

None of the babies passed meconium in the first 24 hours of life. In six babies the abdomen became progressively distended. This resolved in four (cases 1-4) after spontaneous passage of a meconium plug two to four days after birth. In two babies (cases 5 and 6) the distension did not respond to repeated saline enemas and the obstruction was relieved only after an ileostomy was fashioned. In case 5 recovery was uncomplicated and the ileostomy was closed on day 40, but in case 6 the baby died at the age of three months from septicaemia after the ileostomy was closed. In the two remaining babies (cases 7 and 8) the bowel obstruction was treated with repeated enemas with iohexol from day 3 after birth; one (case 7) responded well and recovered after passage of a meconium plug, but the other did not respond and died from severe respiratory distress syndrome on day 8.

### Comment

In pregnancies in which uteroplacental insufficiency is diagnosed the finding of a hyperechogenic fetal bowel may be useful as an indicator of obstruction due to meconium. Meconium is a rare cause of neonatal obstruction of the bowel compared with conditions such as congenital malformations of the gastrointestinal tract and paralytic ileus associated with respiratory distress. Hence antenatal detection of hyperechogenic bowel may allow a correct diagnosis to be made earlier and specific treatment to be started sooner, possibly reducing the need for laparotomies. A prospective study is being carried out to establish the value of hyperechogenic bowel in predicting obstruction due to meconium.

MB was supported by Action Research for the Crippled Child. We thank Mrs Angela McPherson for secretarial help.

- 1 Vinograd I, Mogle P, Peleg O, Alpen G, Lernau OZ. Meconium disease in premature infants with very low birth weight. *J Pediatr* 1983;103:963-6.
- 2 Blott M, Greenough A, Nicolaidis KH, Moscoso G, Gibb D, Campbell S. Fetal breathing movements as predictor of favourable pregnancy outcome after oligohydramnios due to membrane rupture in second trimester. *Lancet* 1987;ii:129-31.
- 3 Hackett GA, Campbell S, Gamsu H, Cohen-Overbeek T, Pearce JMF. Doppler studies in the growth retarded fetus and prediction of neonatal necrotising enterocolitis, haemorrhage, and neonatal morbidity. *Br Med J* 1987;294:13-6.
- 4 Soothill PW, Nicolaidis KH, Rodeck CH, Campbell S. The effect of gestational age on fetal and intervillous blood gas and acid-base values in human pregnancy. *Fetal Therapy* 1986;1:168-75.

(Accepted 23 September 1987)

Departments of Child Health and Obstetrics, King's College Hospital, London SE5 8RX

M BLOTT, MRCOG, research fellow  
 A GREENOUGH, MD, MRCP, senior lecturer in neonatology  
 H R GAMSU, FRCP, reader in neonatology  
 K NICOLAIDES, MRCOG, senior lecturer in obstetrics  
 S CAMPBELL, FRCOG, professor of obstetrics

Correspondence to: Dr Greenough.