Developmental outcome after intravascular intrauterine transfusion for rhesus haemolytic disease

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Abstract

The development outcome of 16 infants who had rhesus disease was assessed at 18 months. Eight had received intravascular intrauterine transfusion and eight post-natal exchange transfusions. There was no difference in developmental outcome and neither group was different from the population as a whole.

(Arch Dis Child 1994; 70: F52-F53)

Severe rhesus haemolytic disease occurs in approximately one in 6000 pregnancies.¹ Although the incidence of rhesus haemolytic disease has fallen since the introduction of anti-D prophylaxis new cases still occur.

The current approach to the management of severe rhesus disease includes intravascular transfusion.² This technique allows treatment at a much earlier gestational age than was previously possible thus reducing death from severe anaemia in utero. At the time of delivery infants who have received multiple transfusions have almost all donor blood. Hyperbilirubinaemia is less common and the requirement for exchange transfusions is greatly reduced. Survival rates of 70-90% are possible.³ The success of invasive antenatal management must be assessed not only

by neonatal survival but also by satisfactory development outcome.

Patients, methods, and results

The study group comprised 16 infants who were delivered between July 1986 and June 1988. Eight infants who suffered from rhesus disease and required intrauterine intravascular transfusion were compared with eight selected contemporary control infants. The control infants suffered from rhesus disease requiring close antenatal monitoring but no intrauterine transfusion. Control infants of similar gestational age were selected and all required post-natal exchange transfusion. For one family in very poor social circumstances a similar family for the control group was found (case 7).

All 16 children were assessed between 18 and 24 months of age by the consultant in developmental paediatrics (RED) and principal psychologist (CDP). At the time of assessment neither the paediatrician nor the psychologist were aware of the perinatal history.

The children were given the Cattell infant intelligence test and a neurological and general examination. Weight, length, and occipitofrontal circumference were recorded and walking skills were assessed. Assessment of fine motor skills included cube building and placing of pegs into holes. Behaviour and activity were observed during the consultation and parents were questioned about behaviour and activity at home. Results are shown in tables 1 and 2.

The mean developmental quotient of the treatment group corrected for gestational age was 97.6 (95% confidence interval 87.2 to 108.1) that of the control group was 101.1 (91.2 to 111.1). Growth parameters measured showed no obvious trend in this small group. At the time of examination none of the children had any motor disorder, all were making satisfactory developmental progress, and there was no difference in observed or reported behaviour and activity.

One child in the treatment group (case 6) developed bilateral subdural haemorrhages at age 4 months secondary to non-accidental injury. She required insertion of bilateral subdural peritoneal shunts but her development at 18 months was normal.

Discussion

Infants in the treatment group received intrauterine transfusion from as early as 18 weeks' gestation. At the time of the first

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Accepted 6 September 1993

Table 1 Gestation, birth weight, and developmental quotient at age 18 months corrected for prematurity for individual patients and mean values

Case No	Gestation (weeks)		Birth weight (g)		Developmental quotient	
	Treatment	Control	Treatment	Control	Treatment	Control
1	32	37	1790	2940	100	104
2	33	36	1230	2800	109	108
3	33	33	2720	2520	100	111
4	33	32	1190	1170	94	116
5	32	37	2060	3460	114	89
6	32	32	2260	1310	104	107
7	32	32	2440	2070	78	91
8	33	36	2060	2420	82	83
Mean	32.5	34.3	1960	2330	97.6	101.1

Table 2 Weight, length, and occipitofrontal circumference (OFC) at 18 months expressed as centile corrected for prematurity

Case No	Weight		Length		OFC	
	Treatment	Control	Treatment	Control	Treatment	Control
1	10	97	50	*	90	50
2	75	25	25	10	75	50
3	50	75	55	25	98	98
4	50	25	25	25	50	60
5	75	50	90	25	75	70
6	25	3	3	3	98	70
7	50	50	25	25	20	60
8	3	3	3	3	3	3

*Patient uncooperative.

transfusion many of these infants are severely anaemic with packed cell volume values of less than 0.2 in almost one third.¹ During this period of rapid growth and organ development severe anaemia and thus diminished oxygen delivery might be expected to jeopardise subsequent outcome.

The treatment group was compared with controls with similar postnatal problems but without severe early antenatal anaemia. There was no difference in development between the groups studied and neither of the

groups were different from the population as a whole. In conclusion, we found that intrauterine transfusion resulted in an entirely satisfactory developmental outcome at age 18–24 months.

- 1 Swinhoe DJ, Gilmore DH, McNay MB, Whittle MJ. Rhesus haemolytic disease: continuing problem of management. *Arch Dis Child* 1990; 65: 365–8.
- 2 Rodeck CH, Nicolaides KH, Warsof SL, Fysh WJ, Gamsu HR, Kemp JR. The management of severe rhesus iso-immunisation by fetoscopic intravascular transfusions. *Am J Obstet Gynecol* 1984; 150: 769–74.
- 3 Whittle MJ. Rhesus haemolytic disease. *Arch Dis Child* 1992; 67: 65–8.