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Role of IVIG in Preventing Exchange Tranfusions in Rh Hemolytic Disease

Intravenous immunoglobulin (IVIG) treatment has been reported to decrease requirements for exchange transfusion, phototherapy, and to shorten hospitalization time for patients with Rh hemolytic disease of the newborn(1-3). It was shown that IVIG is also effective in prevention of repeated exchange transfusions when used after the first exchange transfusion(4). Here we report four cases of hemolytic disease in which exchange transfusion was indicated, but the patients were initially treated with IVIG.

Case 1 was a male infant. At birth, the infant did not show marked icterus but mild skin edema and hepatosplenomegaly were noted. The cord blood hemoglobin (Hb) level was 10.3 g/dL, and the total bilirubin level was 4.4 mg/dL. IVIG was administered. Four hours later, the patient's Hb and total bilirubin levels were 11.2 g/dL and 5.3 mg/dL, respectively.

Case 2 was a boy. On admission to our hospital at 26 hours after birth, the patient was icteric and his liver was palpable 4 cm below the costal margin. The serum Hb was 12 g/dL, the total bilirubin level was 19 mg/dL. He was given IVIG and phototherapy was initiated. Six hours later, the baby's Hb level was 13 g/dL and his total bilirubin had dropped to 14 g/dL.

Case 3 was a female. On admission to our hospital 10 hours after birth, the infant was icteric and both her liver and spleen were enlarged. The serum Hb level was 11 g/dL, total bilirubin was 10.5 mg/dL. The baby was given IVIG and started on phototherapy. Four hours later, her Hb level was 11.5 g/dL and her total bilirubin had fallen to 9 mg/dL.

Case 4 was a girl. Physical examination at birth revealed hepatosplenomegaly. She was given phototherapy in the first 24 hours of life. On admission to our hospital at 24 hours after delivery, the patient's serum Hb was 10 g/dL, and total bilirubin was 18 mg/dL. The baby was given IVIG. Six hours later, her Hb had risen to 12 g/dL, and her total bilirubin level was 16 mg/dL.

The four patients in this report developed hemolytic disease due to Rh-incompatibility. Exchange transfusion was indicated but was withheld, and treatment with 0.5 g/kg IVIG significantly reduced the rate of hemolysis in all cases. Only one of the four patients required subsequent red cell transfusions.

TABLE I–*Summary of the Characteristics and Laboratory Findings for the Four Cases.*

		Case 1	Case 2	Case 3	Case 4
Birth weight (g)		2200	2500	3650	2900
Gestational week at delivery		32	34	38	38
Cord blood	Hb (g/dL)	10.3	ND	12.8	14.5
	Tbil (mg/dL)	4.4	ND	4.5	4.5
Direct Coombs'		+	+	+	+
Time of IVIG (postnatal hour)		2	26	10	24
Before/after* IVIG	Hb (g/dL)	10.3/11.2	12/13	11/11.5	10/12
	Tbil (mg/dL)	4.4/5.3	19/14	10.5/9	18/16
	Reticulocytes	13%/ND	ND	ND	17%/12%
No. of Transfusions		2	0	0	0
Screening for hearing and neurologic development		N	N	N	N

*4-6 hours after IVIG treatment.
ND: Not determined; Hb: Hemoglobin, Tbil: Total Bilirubin.

The exact mechanism of action of IVIG in hemolytic disease of newborn is unknown. It is hypothesised that the anti-D sensitised neonatal erythrocytes are destroyed by antibody dependent cellular cytotoxic effects mediated by the Fc receptor on the cells of the reticuloendothelial system. IVIG would occupy the Fc receptor sites, thus competing with the anti-D sensitised neonatal erythrocytes and preventing hemolysis(5). This mechanism explained the abrupt block in hemolysis and arrest in rising bilirubin levels with adjuvant phototherapy in these four cases, but this observation needs to be validated by other studies as well.

We think that delaying exchange transfusion by 4-6 hours, until the results of IVIG treatment are known, may at least partially reduce the need for these transfusions. Another important consideration is that IVIG therapy can be administered quickly. This may gain some valuable time for the patient, as it take may take hours to prepare for an exchange transfusion.

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Meningitis with Bilateral Acute Suppurative Otitis Media caused by Group A Streptococcus

Group A streptococcal (GAS) invasive disease has become increasingly common in recent years but meningitis caused by GAS is still relatively uncommon(1). Recently, severe and fulminant cases of Group A streptococcal meningitis have been reported(2) but it is rather an uncommon organism causing meningitis beyond neonatal period(3). We report a 10-year-old child with bilateral otitis media leading on to Group A streptococcal meningitis with a dramatically rapid course and fatal outcome. A previously healthy 10 year old boy with a past history of purulent ear discharge from the left ear was admitted to our hospital with the chief complaint of generalized headache and moderate to high grade fever for the last 10 days. Along with the headache he had four to five episodes of vomiting which were non-bilious and non-projectile during the last 5 days. He became lethargic and drowsy 2 hours prior to admission. However, there was no history of seizures, trauma, focal deficit or cyanosis.

On examination, the child was found to be drowsy, his pupils were of normal size and normally reacting to light. There was no cranial nerve or focal deficit. However, the plantar response was extensor and all the signs of meningeal irritation (neck rigidity, Kernig's and Brudzinski's sign) were present. On general physical examination he weighed 28 Kgs, his pulse rate was 72/minute, respiratory rate = 32/min and blood pressure was 130/70 mm Hg. Rest of the systemic examination was normal. His blood examination revealed hemoglobin of 10 gm%. Total leukocyte count was 25,400/mm^3 with 85% neutrophils and serum electrolytes were within normal limits (Na = 142 meq/L, K = 4.1 meq/L). Blood urea was 41 mg% and serum creatinine was 1 mg%. The liver function tests were within normal limits. The cerebrospinal fluid (CSF) examination revealed 3,200 WBCs/µL with 80% neutrophils, glucose 10 mg% against the blood glucose of 204 mg% and CSF protein was 210 mg%. Gram stained smear of CSF showed gram-positive cocci in chains. CSF culture grew b-hemolytic streptococci that was identified, as *Streptococcus pyogenes*, which was sensitive to penicillin, erythromycin, ciprofloxacin, vancomycin and ceftriaxone, although blood culture was sterile. The CT scan of the head could not be done due to lack of the facility in our hospital and unwillingness on the part of the attendants to get it from private setup. The child was diagnosed as pyogenic meningitis with raised intracranial tension but brain