

Intravenous Immune Globulin (IVIG) Administration in Neonates

Patient population

Neonates with isoimmune hemolytic disease of the newborn due to Rh or ABO incompatibility. Although data are limited, IVIG may be helpful in other types of Rh hemolytic disease such as anti-C and anti-E. It may be considered for non-isoimmune causes of hemolytic anemia such as G6PD deficiency.

Other indications for IVIG in neonates include immune thrombocytopenia and overwhelming sepsis.

Criteria for Use in Isoimmune Hemolytic Disease

In Rh or ABO hemolytic disease, if the total serum bilirubin is rising despite intensive phototherapy or the total serum bilirubin level is within 2 to 3 mg/dL (34-51 μ mol/L) of the exchange level.

Suggested guidelines from Hammerman 2000

Total Serum Bilirubin (TSB) Levels for IVIG Administration in Term Healthy ABO-incompatible Coombs-positive Neonates

Age	TSB level despite 4 hours of phototherapy
< 12 hours	204 mcmol/L (12 mg/dL)
12-24 hours	272 mcmol/L (16 mg/dL)
25-72 hours	306 mcmol/L (18 mg/dL)

Additional Criteria: Hb < 130 g/L

Consider administration as early as possible when active hemolytic disease of newborn is diagnosed and exchange transfusion is a possibility.

Intravenous gammaglobulin has been shown to reduce the need for exchange transfusion, repeat exchange transfusions, the duration of hospital stay, and phototherapy in Rh and ABO hemolytic disease. The mechanism of action appears to be related to blockage of Fc receptors in the neonatal reticuloendothelial system.

Contraindications

Neonates with IgA deficiency or hypogammaglobulinemia (with IgA antibodies in the patient's serum) –risk of hypersensitivity or anaphylactic reactions

Anti IgE/IgG antibodies

Dosage and Administration

Use Gamunex (10% Immune Globulin Intravenous (Human)), a ready-to-use sterile solution of human immune protein for intravenous administration.

Dose of 0.5 g -1.0 g/kg IVIG should be infused over 2 hours. If necessary, the dose can be repeated in 12 hours.

Sample Calculation

Gamunex is supplied in 2.5 g and 5 g vials. To minimize wastage, choose the nearest vial size according to the patient's weight to administer within the range of 0.5-1.0 g/kg.

3 kg infant

Dose of IVIG = 3 kg x 1.0 g/kg = 3 g (round to 2.5 g)

10% Solution has 1.0 g in 10 mL or 2.5 g in 25 mL

Infuse at 1.5 mL/hr (0.5 mL/kg/hr) x 30 minutes

If tolerated, increase to 12 mL/hr (4 mL/kg/hr) to infuse total volume over approximately 2-2.5 hours

For Gamunex, the maximum allowed rate of infusion is 8.4 mL/kg/hr

Weight kg	IVIG dose grams	Volume of 10% IVIG to be administered mL	Initial Infusion rate (0.5 mL/kg/hr) x 30 minutes mL/hour	If initial infusion tolerated, final infusion rate (4 mL/kg/hr) Over 2-2.5 hours mL/hour
2.5	2.5	25	1.25	10
3.0	2.5	25	1.5	12
3.5	2.5	25	1.75	14
4.0	5.0	50	2.0	16
4.5	5.0	50	2.25	18

IVIG should be administered by itself, with careful monitoring during the infusion. If adverse reactions occur, reduce infusion to a lower rate or discontinue administration.

Vital signs should be monitored during the infusion (preferably q 15 min x 2, then every hour for the duration of the procedure and one hour post infusion, total 3 hours). Monitoring to include: temperature, respiratory rate and pattern, heart rate and blood pressure

Precautions

Ensure that patient is not volume depleted before initiation of therapy.

In the large multicenter trials involving infants, very few adverse reactions were noted during infusion.

Adverse reactions may include: mild increases or decreases in blood pressure, heart rate, or temperature (that were reversed by slowing the rate of infusion) or acute fluid overload.

Adverse Reactions

Allergic

Hemolytic (there have been rare reports of significant intravascular hemolysis post-infusion, more commonly seen in Group A patients. It is important to monitor for hemoglobin drop, bilirubin rise and hemoglobinuria post-infusion)

Volume overload

Local: redness or flushing at infusion site

Symptoms

Fever, headache, meningismis, nausea, low back pain, transient hypotension, mild hemolytic anemia, tachycardia

Long Term Precautions

Possible need for late red cell transfusions

Risk of transmission of blood borne infections (from pooled human plasma)

Transfer of other red cell antibodies e.g. anti-D

References

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