Transfusion Related Acute Lung Injury with Intravenous Immunoglobulin

V GUPTA, P GUPTA, AND TP YADAV

From the Department of Pediatrics and Neonatology, PGIMER and associate Dr Ram Manohar Lohia Hospital, New Delhi, India.

Correspondence to:
Dr T P Yadav, 16 LF Tansen Marg, Bengali Market, Delhi 110 001, India.
tribhuvanpal@gmail.com
Received: March 04, 2010;
Initial review: May 7, 2010;
Accepted: July 20, 2010.

This case report describes transfusion related acute lung injury with the use of intravenous immunoglobulin in a child with Guillain barre syndrome.

Key words: *Acute lung injury, Intravenous immunoglobulin, Transfusion*.

Intravenous immunoglobulin (IVIG), a pooled plasma derivative, has long been in clinical use and is considered a safe drug. Serious complications of IVIG infusion are extremely rare. We report a case of life threatening pulmonary edema in a two-year old child following IVIG infusion.

CASE REPORT

A 2-year (10 kg) female child was admitted with complaints of progressively increasing weakness of both lower limbs and trunk for last 10 days, and inability to speak and difficulty in feeding for last 5 days. There was no prior medical history of urinary retention, seizures, loss of consciousness, headache, vomiting, rash, loose motion, cough, coryza, paresthesias, hyperaesthesias or drug intake. The child did not suffer from any medical illness or allergy in the past. There was decreased power in lower limbs (3/5), trunk (3/5) and upper limbs(4/5), generalized hypotonia with head lag, hyporeflexia with loss of gag reflex with no pooling of secretions. All other cranial nerves were normal and rest of the systemic examination was also unremarkable. CSF showed albumino-cytological dissociation and nerve conduction velocity revealed demyelinating pattern consistent with Guillain Barré syndrome. Her serum levels of IgM, IgG and IgA were within normal limits. She was started on IVIG at the dose of 400 mg/kg (2g/kg over 5 days) with infusion rate of 0.05 mL/kg/ min.

Nearly two hrs after IVIG infusion, child developed signs of hypoxia in the form of increasing respiratory distress with bilateral basal coarse crepts, air hunger and irritability. Arterial blood gas on room air showed pH 7.36, PaO_2 of 53 mmHg, $PaCO_2$ of 41 mmHg, and O_2 saturation of 88 percent. PaO_2/FiO_2 was = 252.38 mmHg (53/0.21). She was put on nasal oxygen. Her respiratory distress worsened in next few minutes and blood pressure started falling. She was intubated and kept on mechanical ventilation in the intensive care unit. She was given one fluid bolus of normal saline at 20 mL/kg over 1 hour. Chest *X*-ray done after intubation revealed a normal cardiac silhouette and bilateral interstitial and alveolar infiltrates consistent with pulmonary edema. PaO_2 / FiO_2 was 237.5mm Hg (95/0.4). CVP was 7 cm. Echocardio-graphy revealed normal left ventricular function with ejection fraction of 60 %. In view of falling BP with CVP of 7cm, no more fluids were administered and child was started on inotropic support along with mechanical ventilation. She maintained normal acid base balance with normoxia (95% saturation) during the ventilation. After 72 hrs, she was successfully extubated and maintained normoxia on minimal oxygen support (FiO_2 35%). Repeat chest *X*-ray after 7 days of extubation was normal. She did not receive any further dosages of IVIG. During the next 10 days of hospitalization, her gag reflex and power in the trunk and lower limbs improved.

DISCUSSION

Our patient developed pulmonary edema and hypotension within 2 hours of completion of first dose of IVIG. This life threatening complication of acute lung injury is well known after the administration of blood components but not after IVIG. This usually presents within 1-6 h after transfusion and manifest as clinical syndrome characterized by severe respiratory distress, pulmonary edema, hypoxemia (PaO_2/FiO_2 <300 mmHg), normal left ventricular function and fever [1]. Our patient fulfills the clinical criteria for transfusion related acute lung injury (TRALI) as described by Kleinman, *et al*. [2]. TRALI after IVIG infusion has been reported only in two adult patients

so far described and not in pediatric patients as per available English literature.

A large number of adverse reactions to IVIG have been reported [4-7], including hypersensitivity reaction like urticaria, angioedema and bronchospasm. Respiratory distress following any infusion can also occur because of circulatory overload or anaphylactic transfusion reactions. Transfusion-associated circulatory overload develops within minutes to hours of transfusion as congestive cardiac failure, cyanosis, hypertension and it rapidly responds to aggressive diuresis and ventilatory support. Anaphylactic transfusion reactions results in laryngeal and bronchial spasm and manifest as tachypnea, wheezing, cyanosis, erythma, edema and severe hypotension, during the transfusion of any type of protein-containing blood component [8].

Akin to post blood component infusion TRALI, that following IVIG infusion could have been due to immune mediated mechanism [9] or neutrophil priming mechanism [2]. In our patient, the possible mechanism could not be ascertained since the estimation of antibody against neutrophils was not available.

It is suggested that clinician using IVIG should closely monitor the patients to pick up this potential fatal complication at the earliest and institute appropriate supportive care timely.

Contributors: VG and TPY were involved in active case management and review of literature. VG and PG revised the paper for critically important intellectual content. All authors approved the final version to be published.

Funding: None. *Competing interest:* None stated.

REFERENCES

1. Rizk A, Gorson KC, Kenney L, Weinstein R. Transfusion-related acute lung injury after the infusion of IVIG. Transfusion. 2001;41:264-8.
2. Kleinman S, Caulfield T, Chan P, Davenport R, McFarland J, McPhedran S, *et al*. Toward an understanding of transfusion-related acute lung injury: statement of a consensus panel. Transfusion. 2004;44:1774-89.
3. Suassuna JHR, da Costa MADL, Faria RA, Melichar AC. Noncardiogenic pulmonary edema triggered by intravenous immunoglobulin in cancer – associated thrombotic thrombocytopenic purpura- hemolytic uremic syndrome. Nephron. 1997;77:368-70.
4. Orbach H, Katz U, Sherer Y, Shoenfeld Y. Intravenous immunoglobulin: adverse effects and safe administration. Clin Rev Allergy Immunol. 2005;29:173-84.
5. Berkovitch M, Dolinski G, Tauber T, Aladjem M, Kaplinsky C. Neutropenia as a complication of intravenous immunoglobulin (IVIG) therapy in children with immune thrombocytopenic purpura: common and non-alarming. Int J Immunopharmacol. 1999;21:411-15.
6. Daphnis E, Stylianou K, Alexandrakis M, Xylouri I, Vardaki E, Stratigis S, *et al.* Acute renal failure, translocational hyponatremia and hyperkalemia following intravenous immunoglobulin therapy. Nephron Clin Pract. 2007;106:c143-8.
7. Shorr AF, Kester KE. Meningitis and hepatitis complicating intravenous immunoglobulin therapy. Ann Pharmacother. 1996;30:1115-6.
8. Silliman CC, Ambruso DR and Boshkov LK. Transfusion – related acute lung injury. Blood. 2005:105:2266-73.
9. Moalic V, Vaillant C, Ferec C . Transfusion related acute lung injury (TRALI): an unrecognised pathology. Pathol Biol. 2005;53:111-5.

Kawasaki Disease in Association with Urinary Tract Infection

ENTESAR H HUSAIN[†‡] AND [#]MARYAM AL-RASHID

From the [†]Department of Pediatrics, Faculty of Medicine; [‡]Department of Pediatrics, Mubarak Al-Kabeer Hospital; [#]Department of Pediatrics, Amiri Hospital; Kuwait.

Correspondence to:
Dr Entesar H Husain,
Department of Pediatrics, Faculty of Medicine, P.O. Box 24923, Safat, Kuwait 13110. entesar@qualitynet.net
Received: March 03, 2010;
Initial review: April 06, 2010;
Accepted: July 26, 2010.

We report a 2-month-old infant with *E. coli* urinary tract infection, who did not respond to antibiotic therapy. She later developed clinical features fulfilling criteria of Kawasaki disease (KD), and was treated with intravenous immunolglobulin and aspirin. KD should be considered in the differential diagnosis in patients who present with infection and do not respond to antibiotic therapy.

Key words: *Kawasaki disease, Urinary tract infection*.