

Respiratory distress ... out of nowhere!

A six-year-old boy is brought to the emergency department after falling from his bicycle while going down a hill. He was wearing a helmet when he fell. On arrival, he is pale with normal vital signs, but a splenic laceration is found on abdominal ultrasound. The lungs, heart, liver and bones are normal. The paediatrician and surgeon favour a conservative approach and admit the child for close observation. Because of a hemoglobin level of 63 g/L, a red blood cell transfusion is given. One hour after the transfusion ends, the patient develops respiratory distress, fever, tachycardia and cyanosis. His blood pressure remains in the low normal range and he has no rash. Blood gas

analysis reveals respiratory acidosis and a partial pressure of O₂ in arterial blood of 100 mmHg while on 100% fraction of inspired O₂. A chest radiograph confirms severe bilateral pulmonary infiltrates. A rapid deterioration follows, requiring intubation, mechanical ventilation and intravenous fluid bolus administration. A cardiac ultrasound does not show any evidence of heart failure and the central venous pressure measured by a central catheter is 8 mmHg. A full septic workup is negative. Over the next 48 h, he progressively improves and is successfully extubated. His hemoglobin level remains stable at 80 g/L and surgery is not necessary. He returns home a few days later.

LEARNING POINTS

- Transfusion-related acute lung injury (TRALI) has become the most common cause of transfusion-related death in recent years.
- The reported incidence in adults is approximately one in 2000 transfusions; however, it is under-diagnosed and under-reported. In the paediatric population, the incidence is unknown. A recent prospective study in a paediatric intensive care unit found one possible TRALI case in 2505 transfusions.
- TRALI can occur with any blood product containing plasma (eg, red blood cells, platelets and fresh frozen plasma). Extremely small volumes of plasma can trigger the reaction.
- TRALI symptoms usually occur within 6 h of initiating a transfusion and consist of respiratory distress, hypoxemia, fever, tachycardia and hypotension. New bilateral pulmonary infiltrates, alveolar and interstitial, appear on chest radiography. Cardiac insufficiency or circulatory overload has to be excluded.
- With ventilatory and hemodynamic support, most TRALI patients improve rapidly (in less than 96 h) without long-term sequelae. The mortality rate is 6%.
- If TRALI is suspected, the blood bank should be alerted immediately to prevent administration of remaining blood products from the same donor to other patients, thereby avoiding further TRALI episodes.
- The CPSP study, which started in September 2005, is the first study to look at TRALI in the paediatric population. The goal is to better characterize the incidence, presentation and outcome of TRALI. Surveillance will also promote education and increase awareness of health care professionals.

The Canadian Paediatric Surveillance Program (CPSP) is a joint project of the Canadian Paediatric Society and Public Health Agency of Canada that undertakes the surveillance of rare diseases and conditions in children. For more information visit our Web site at <www.cps.ca/cpsp> or <www.cps.ca/pcsp>.