

Hypocalcaemia Following Transfusion of a Small Volume of Red Blood Cell Concentrate: An Unusual Case

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Dear editor,

Hypocalcaemia is a known risk factor of massive blood transfusion. However, its occurrence following transfusion of small volume of blood is rare. We present a case of 60-year-old female who developed hypocalcaemic tetany following transfusion of a small amount of packed cells.

The patient was a known case of Stage IV carcinoma stomach on palliative chemotherapy. She was admitted with complaints of multiple episodes of fever and vomiting. A diagnosis of febrile neutropenia was made. On routine investigations, it was found that she also had hypocalcaemia (serum calcium=8 mg/dL) for which she was given intravenous calcium gluconate and started on oral calcium supplementation. In view of anaemia (Haemoglobin=5.8 gm/dL), transfusion of red blood cell concentrate was planned. The anticoagulant in the blood bag transfused was citrate-phosphate-dextrose. The transfusion was started at 1 mL/minute and then increased to 4 mL/minute after 15 minutes. During transfusion, the patient developed fever. The transfusion was stopped. Indirect Coombs test of the pre-transfusion sample and direct Coombs test of the post transfusion sample were negative. Both the samples were compatible with the blood bag and hence there was no evidence of immunohaemolysis. The haemoglobin further dropped on day 10 of admission therefore, another packed red cell transfusion was planned. After about 3 hours of transfusion, the patient developed tremors followed by carpopedal spasm and tetany leading to cardiac arrest. Cardiopulmonary resuscitation failed and the patient died. The indirect Coombs test of the pre-transfusion sample was negative and the compatible with the blood bag on cross match. The post transfusion sample was not available for assessment. Since patient already had documented hypocalcaemia before transfusion, it may have exacerbated during transfusion which lead to the various symptoms and ultimately cardiac arrest.

Incidence of hypocalcaemia during blood transfusion is dependent on the clinical setting. The cause is a rapid infusion of citrate which

occurs when massive transfusion of citrated blood is done or when there is delayed metabolism of citrate or during apheresis. It usually presents as paresthesias, tetany or arrhythmia. Diagnostic testing includes ionized calcium assay and electrocardiogram which shows a prolonged QT interval. The treatment includes slow infusion of calcium while monitoring ionized calcium levels in severe cases. For milder symptoms, calcium is given perorally for example during apheresis [1]. Hypocalcaemia usually occurs in patients who are in shock or are hypothermic. Myocardial contraction is dependent on intracellular movement of ionized calcium therefore hypocalcaemia depresses cardiac function [1]. Usually unless a patient has a predisposing condition that hinders citrate metabolism, hypocalcaemia due to citrate overload does not require any treatment other than slowing infusion.

Niven MJ et al., reported two cases in which transfusion of small volume of packed red blood cells was sufficient to precipitate symptomatic hypocalcaemia. One of the cases had history of partial thyroidectomy and the other had documented hypocalcaemia but no definitive diagnosis [2]. Sood T et al., reported a case of tetany following transfusion of a small volume of packed red blood cells in a 54-year-old female [3].

Even a small volume of blood transfusion may precipitate tetany by leading to multiple electrolyte disturbances (potassium, calcium and magnesium) [3]. Careful monitoring of these electrolytes is recommended before starting blood transfusion.

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