

**Transfusion-related acute lung injury in a patient with systemic lupus erythematosus**

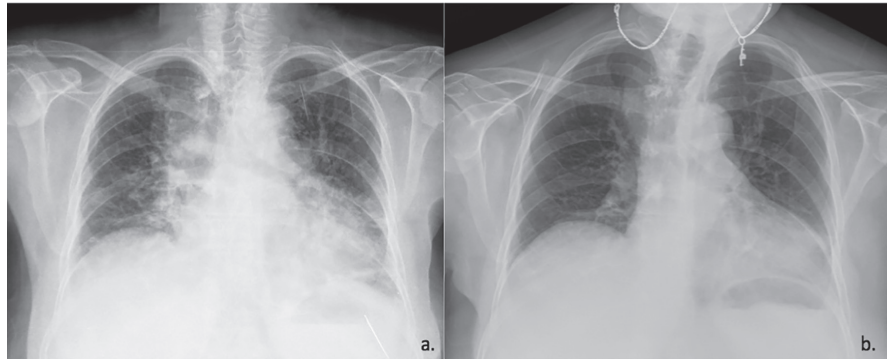
Sirs,

The term Transfusion-Related Acute Lung Injury (TRALI) was coined by Popovsky *et al.* (1) TRALI is a rare (0.03–0.1%) but potentially fatal complication, which may appear during or post-transfusion of blood products or intravenous immunoglobulin (IVIG) (2). The true incidence is not known (3) and there is no specific laboratory test for diagnosis. The National Heart, Lung, and Blood Institute defined TRALI as a new onset acute lung injury (ALI) occurring during or within six hours after blood product administration with concurrent hypoxaemia, bilateral infiltrates on chest x-ray (CXR), no evidence of circulatory overload, and no pre-existing ALI risk factors before transfusion (4).

In this letter we present a case of a sixty-one-year-old female with a past medical history of systemic lupus erythematosus (SLE), antiphospholipid syndrome, and autoimmune haemolytic anaemia (AIHA), who has been transferred to our hospital due to a refractory to corticosteroids treatment AIHA. Clinical examination showed a sick patient with pale face and swelling of the wrists bilaterally. Laboratory evaluation revealed: white blood cells 3.600/μL, platelets (PLT) 48.000/μL, haemoglobin (Hb) 6.0g/dL, haematocrit 17.1%, reticulocyte count 18.9%, lactate dehydrogenase 704IU/L, positive direct/indirect Coombs, bilirubin 2.7mg/dL. The rest of laboratory tests as well as urinalysis, double stranded DNA (ds-DNA) and complement levels were within normal limits.

The next days, a total of three units of packed red blood cells (PRBCs) and an IVIG infusion were administered in order to control the AIHA. On the last transfusion, three hours after the completion of the procedure, the patient developed tachypnoea, oxygen saturation <85%, tachycardia (98 bpm), fever and hypotension. Lung auscultation revealed bilateral basal fine inspiratory crackles. An urgent CXR showed extensive bilateral pulmonary infiltrates. The electrocardiogram and the echocardiography ruled out cardiogenic dysfunction and haematological investigations at this stage showed no evidence of any haemolytic process or other pathology, thus, in the absence of other mechanisms to explain ALI and the patient's clinical context, a diagnosis of TRALI was made. The patient improved markedly on the fourth day of oxygen therapy (new CXR on 4<sup>th</sup> day – Fig. 1).

In such compromised patient, the differential diagnosis should include a wide spectrum of diseases and complications. TRALI



**Fig. 1.** Bilateral pulmonary infiltrates post-transfusion with significant radiological improvement on the fourth day of oxygen therapy.

is an uncommon, challenging diagnosis for the clinicians and probably an underrecognised complication (5), which should be distinguished from other ALI pathologies due to different mortality rates among them (7). The pathophysiology is still unclear. A two-hit hypothesis has been suggested wherein pre-existing pulmonary pathology leads to localisation of neutrophils to the pulmonary microvasculature. The second hit occurs when the aforementioned antibodies are transfused and attach to and activate neutrophils, leading to release of cytokines and vasoactive substances that induce non-cardiac pulmonary oedema. Previous transfusion can also lead to donor sensitisation (7). On the other hand, patients with SLE, are susceptible to develop lung disease including inflammatory forms of interstitial lung disease and alveolar haemorrhage. It is well-known that vascular injury is one of the key features in those patients. Diffuse alveolar haemorrhage is a consequence of neutrophilic infiltration, immune complex deposition, and destruction of pulmonary vascular endothelium (8). It can be presented with dyspnoea, fever, chest pain and haemoptysis and the workup shows hypocomplementaemia and a positive ds-DNA. Transfusion of blood products containing antibodies against HNA can result in direct activation of intravascular neutrophils. Intravascular activation of neutrophils results in damage to endothelial cells, vascular leakage and pulmonary oedema. Thus, both diseases, TRALI and SLE, seem to share a common pathophysiologic pathway. Management of TRALI is mainly supportive (oxygen and ventilatory support) (9). Steroids and diuretics have no definite role. In general, most cases show improvement within the first few hours and completely resolve within 24–96 hours (10).

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