

Keyword: TRALI

**TRALI** = The transfusion of blood products is occasionally complicated by acute lung injury (ALI), which can progress to the acute respiratory distress syndrome (ARDS). This process is known as transfusion-related acute lung injury (TRALI) or a pulmonary leukoagglutinin reaction, and is frequently misdiagnosed or overlooked. TRALI should be considered when **dyspnea, hypoxemia, and pulmonary infiltrates** occur during or within a few hours after transfusion of any blood product containing plasma.

**Epidemiology** - The incidence of TRALI at one center was 2 per 10,000 units of blood administered and 16 per 10,000 patients transfused. TRALI is a life-threatening adverse effect of transfusion, and is the leading cause of transfusion related mortality in the United States.

**Pathogenesis** - The pathogenesis of TRALI classically has been attributed to the interaction between anti-granulocyte antibodies (usually of donor origin) and granulocytes (usually of recipient origin). In addition, bioactive compounds produced during the storage of blood products have been implicated. It is now theorized that some combination of these patient- and blood product-related factors leads to the development of TRALI

**Treatment:** The management of the patient with TRALI is **supportive**, with the expectation that clinical improvement will occur spontaneously as the lung injury resolves. Mechanical ventilation is often required for several days, and a high concentration of inspired oxygen and positive end-expiratory pressure initially may be required. Milder cases can be managed with supplemental oxygen alone. Ventilator management should be guided by the **same principles used in patients with acute respiratory distress syndrome (ARDS)**. Extracorporeal membrane oxygenation has been used successfully in a severe case of TRALI following coronary artery bypass surgery.

**The recipient** - Individuals who have developed TRALI should receive no further plasma-containing blood products from the implicated donor. Patients who recover from TRALI do not appear to be at increased risk for recurrent episodes following transfusions from other donors; however, published experience is limited.

**The donor** — Following a case of TRALI, the blood bank and the blood collection facility should also investigate the donor

Question: TRALI

1. A 24 y/o male admitted to the ICU after an extensive exploratory laparotomy from injuries received after a gun shot to the abdomen. He received 4 units of PRBC and 2 of FFP about 1 hour ago. You get report that all injuries were successfully repaired and that this was an uneventful surgery but the patient was not extubated because saturation was a little low at the end. Vital signs now are: BP - 60/40, HR – 120, SpO<sub>2</sub> – 88% on a 100% FiO<sub>2</sub>. The following statements regarding this condition are true **except**:
  - a. The ventilatory strategy can be similar to the one used in the treatment of acute lung injury (ALI)
  - b. The ventilatory strategy can be similar to the one used in the treatment of ARDS
  - c. Above findings can be explained as a pulmonary leukoagglutinin reaction
  - d. The patient most likely have a PaO<sub>2</sub>/FiO<sub>2</sub> ratio of <300
  - e. This patient should never receive blood products again

Answer: E - Individuals who have developed TRALI should receive no further plasma-containing blood products from the implicated donor but yes from others.

2. Regarding transfusion related acute lung injury (TRALI) the following is **true**:
  - a. The management of the patient with TRALI is **supportive**
  - b. Patients who survive a blood transfusion related acute lung injury should never donate blood
  - c. Management include the use of specific antibodies (IgM) to minimize the inflammatory reaction
  - d. TRALI is a very uncommon cause for transfusion related mortality in the United States
  - e. Risk factors for the development of TRALI are easy to identify

Answer: A – Is the only absolute truth