Open Journal of
Clinical & Medical
Case Reports

Volume 5 (2019)
Issue 9

ISSN: 2379-1039

Transfusion related acute lung injury (TRALI): A case report from Intensive care unit

Mohammad Abdul Mannan; Khadiza Begum; Mousumi Sanyal*; Syed Muhammad Shahin Ur Hayat

***Mousumi Sanyal**

Consultant of Internal Medicine, Better Life Hospital, Dhaka, Bangladesh

Email: mousumi_sanyal85@yahoo.com

Abstract

TRALI (Transfusion related acute lung injury) is a rare life threatening complication of blood product transfusion. TRALI consists of dyspnoea, hypotension and fever with bilateral pulmonary oedema that usually develops within few hours of a transfusion. Patients with TRALI often require respiratory support along with other supportive measures, but symptoms tend to resolve within 96 h. Here we have reported a 22 years old lady presented with ruptured ectopic pregnancy and was transfused several units of whole blood during laparotomy. Few hours following the transfusion, she became hypoxic and hypotensive despite of high flow oxygen supplementation. Later she was transferred to Critical Care Department and was intubated. She was kept on PEEP (Positive End Expiratory Pressure). Her chest x-ray showed diffuse alveolar infiltrates. All her blood works, microbiological study came back negative for any sepsis and she was afebrile. Her ECG, Echo and cardiac markers ruled out any heart failure. After 6 days of best supportive care, she improved and was discharged. The aim of reporting this case is to aware the physicians about this fatal complication of transfusion which can be reversed by only the means of supportive care.

Keywords

TRALI; hypoxemia; tachypnea; transfusion; ALI; AR

Introduction

Transfusion related acute lung injury (TRALI) is a serious blood transfusion related complication characterized by the acute onset of non-cardiogenic pulmonary edema following transfusion of plasma containing blood product [1].

TRALI is the third most common transfusion related complication and occurs in 1 in 5000 transfusion within six hours of transfusion [2]. It usually occurs due to immune mediated reaction between specific leucocyte antigens and antibodies resulting in alveolar and capillary cell membrane damage with leucoagglutination and granulocyte infiltration in the lung tissue. It is actually clinically indistinguishable from

Acute Respiratory Distress Syndrome (ARDS) or Acute Lung Injury (ALI). However, exclusion of other causes of ARDS (sepsis, aspiration, etc.) and the onset of lung injury within 6 hours of transfusion points towards TRALI.

TRALI is typically associated with transfusion of whole blood, platelet component or fresh frozen plasma which contains the anti-leucocytic antibody. Most cases occur due to reaction of donor antibody against recipient white cells. Leucocyte filters are not helpful in most of the cases. It is effective in cases where reaction occurs with donor's white cell with recipient's antibody.

TRALI and acute lung injury (ALI) share a common clinical definition except that TRALI is temporally and mechanistically related to the transfusion of blood/blood components.

According to the American-European Consensus Conference of acute respiratory distress syndrome, the criteria for acute lung injury (ALI) are:

Timing: Acute onset Pulmonary artery wedge pressure: ≤ 18 mm Hg when measured, or a lack of clinical evidence of left atrial hypertension

Chest radiograph: Bilateral infiltrates seen on frontal chest radiograph

Hypoxemia: Ratio of PaO2/FIO2 ≤ 300 mm Hg regardless of PEEP level [3].

And the definition of clinical TRALI:

New ALI after transfusion, and The onset of symptoms or signs is during or within 6 hours after transfusion[3].

Management is similar to that for ALI and is predominantly supportive. Corticosteroids, epinephrines and diuretics were traditionally used to treat TRALI. However as the pulmonary oedema in TRALI is not related to fluid overload or cardiac dysfunction, it is logical that maintenance of haemodynamic status is the most beneficial and appropriate therapy even rather than diuresis. So, ventilatory assistance and saline infusion are probably the only therapies that can be recommended, as standard therapy. The use of corticosteroids remains controversial. To stop the transfusion and to inform blood bank to quarantine other units from same donation is an important step of management [4].

Case Story

A 22 years old female was admitted to Dr. Sirajul Islam Medical College Hospital with the diagnosis of ruptured ectopic pregnancy. She had emergency left sided salpingectomy. Following surgery, she developed hypovolemic shock and was resuscitated with a number of whole blood transfusion. Four hours following resuscitation, she developed dyspnea and hypotension. It was not recovered even with high flow oxygen and other conservative management in post operative ward. Then she was referred to Critical Care Department.

In ICU, we started invasive ventilation with FiO_2 100% and PEEP 7 cm of H_2O. She was given inotropic support as her CVP was 8 cm of H_2O. There were coarse crepitations all over her both lung fields. So, keeping ARDS (following septicaemia) in mind, we started injectable steroid. However, her blood, urine and tracheal aspirate culture did not show any growth. All her blood works, including total count, renal function, liver function, and coagulation profile were within normal limit. Cardiac markers were negative for heart failure. Chest X ray showed coarse alveolar infiltrate with normal cardiac shadow.

ECG and Echo showed no abnormality. We stopped steroid when the suspicion of TRALI came. Eventually, she was improved only with supportive care. Then we weaned her off from ventilator. Her Chest X ray also improved gradually. We extubated her on 5^{th} day and discharged on 7^{th} day.

Discussion

TRALI is, currently, one of the leading causes of transfusion related death. It is diagnosed clinically in most of cases. Suspicion of TRALI begins when there is rapid onset of tachypnea, cyanosis, dyspnea, and fever (1°C or higher) within six hours of blood transfusion. Diffuse crackles and decreased breath sounds in base of the lungs associated with hypoxemia, PaO_2/FiO_2 less than 300 mm Hg are common findings in TRALI [4]. Radiographic examination reveals diffuse, fluffy infiltrates consistent with pulmonary edema [4]. The differential diagnosis of patients who have pulmonary insufficiency after transfusion must include circulatory overload, cardiogenic pulmonary edema, anaphylactic transfusion reactions, and transfusion of blood products contaminated with bacteria. This distinction is important because treating patients with TRALI with aggressive diuresis can result in further hypotension, shock, and death [4].

In our patient, the main clue was the time of onset of symptom. She had several units of whole blood transfusion during surgery. Then she developed acute onset of dyspnoea and hypotension without any specific focus in ECG and Chest X Ray after four hours of last transfusion. On the background of Laparotomy, in first instance, we thought about ARDS induced by sepsis, but her blood tests and microbiological study came back negative. Her BNP, Trop-I, Echo ruled out left heart failure. Then we correlated her symptoms with her history and finally our diagnosis was TRALI. With only supportive care, she reversed; which also favours the diagnosis of TRALI.

On basis of literature, ideally TRALI tend to reverse within 96 hours of onsert [4]. Here. The patient improved on sixth day and was discharged on 7^{th} day. The duration was longer.

Ideally, Anti-HLA 8 anti-granulocyte antibody should have been done [4]. However, in the mean time she started improving. This also goes in favor of TRALI. Because, supportive treatment is the best treatment for TRALI.

Human Leucocyte Antigen (HLA) class I and II and antibodies to human neutrophil antigens (HNA) have been implicated for TRALI. Multiparous woman have been shown to have a higher rate of HLA sensitization and plasma from multiparous woman has been demonstrated to play a part in causing impairment of pulmonary function in a randomized controlled trial [5].

conclusion

Without any 'gold standard' investigations, TRALI relies on clinical suspicious and rule of exclusion. The aim of reporting this case is to aware the physicians about this fatal complication of transfusion which can be reversed by the means of supportive care. This case report will encourage further research to find out the effective methods to prevent the occurrence.

References

1. Gajic O, Moore SB. Transfusion related acute lung injury. Mayo Clinic Pro. 2005; 80: 766-770.

2. Toy P, Popovsky MA, Abraham E, Ambruso DR, Holness LG, Kopko PM, McFarland JG, et al. National Heart Lung and Blood Institute Working Group on TRALI. Transfusion related acute lung injury; definition and review. Critical Care Med. 2005; 33; 721-6.

3. Toy P, Lowell C. TRALI--definition, mechanisms, incidence and clinical relevance. Best Pract Res Clin Anaesthesiol. 2007; 21: 183-193.

4. Kopko M, Holland PV. Transfusion related acute lung injury. Brit J Hematology 1999; 105: 322-329.

5. Desmore TL, Goodnough LT, Ali S, Dynis M, Chaptin H. Prevalence of HLA sensitization in female apheresis donars, Transfusion. 1999; 39: 103-106.

Manuscript Information: Received: March 14, 2019; Accepted: June 04, 2019; Published: June 28, 2019

Authors Infomation: Mohammad Abdul Mannan[1]; Khadiza Begum[2]; Mousumi Sanyal[3*]; Syed Muhammad Shahin Ur Hayat[4]
[1]Chief Consultant, Department of Critical Care, Dr. Sirajul Islam Medical College Hospital, Dhaka, Bangladesh.
[2]Associate Professor, Department of Internal Medicine, Ad-Din Medical College Hospital, Dhaka, Bangladesh.
[3]Consultant of Internal Medicine, Better Life Hospital, Dhaka, Bangladesh.
[4]Registrar of Critical Care, Dr. Sirajul Islam medical College Hospital, Dhaka, Bangladesh.

Citation: Mannan MA, Begum K, Sanyal M, Hayat SM. Transfusion related acute lung injury (TRALI): A case report from Intensive care unit. Open J Clin Med Case Rep. 2019; 1552.