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Case Report

Transfusion related acute lung injury in young women with placenta previa and intra uterine death: a case report

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ABSTRACT

The transfusion-related acute lung injury is a life-threatening condition which occurs after administration of blood and blood products containing plasma. We are presenting a case of women with 34+1 weeks of gestation (34 years). Non-cardiogenic pulmonary edema was developed after administration of 6 packed red blood cells (PRBC) and on 4th postnatal day patient was diagnosed with transfusion-related acute lung injury (TRALI). Along with medication, respiratory measures were provided to the patient. Health care provider should look on the patient for clinical symptoms at least for 6 hours after the transfusion, if the patient reports respiratory difficulty, then suspect it as TRALI and perform the diagnostic test to confirm it.

Keywords: Transfusion related acute lung injury, Packed red blood cells, Transfusion associated circulatory overload

INTRODUCTION

The implantation of the placenta in the lower uterine segment either complete or partially is called as placenta previa, and it occurs in 0.4% of pregnancy and it is the most common (20%) cause of antepartum hemorrhage. Prevalence of the placenta previa is 5.2 per 1000 pregnant women worldwide.[1] It is an important contributor to maternal illness, prematurity, intrauterine device (IUD), and perinatal mortality. Transfusion-related acute lung injury (TRALI) is characterized by dyspnea, pulmonary edema, and breathlessness and commonly it occurs within 6 hours after administration of blood products that contain plasma. Transfusion of even one unit blood product can also cause the TRALI.[2]

CASE REPORT

A women "X" 34 years of age with 34 plus 1 weeks of gestation came to All India Institute of Medical Sciences (AIIMS), Jodhpur with a complaint of breathlessness which was insidious in onset, progressive in nature, and associated with anasarca. She reported decreased fetal movement for the last 2 days. She visited a private hospital; and was diagnosed with intra uterine fetal death on sonography and dilated cardiomyopathy on chest-X-ray and severe anaemia. The patient was stabilized and referred to AIIMS, Jodhpur with one packed red blood cells (PRBC) on flow.

Her ultrasonography (USG) findings are suggested of single intrauterine fetus with absent fetal cardiac activity with placenta previa (low lying). The patient had spontaneous conception and well immunized with tetanus-toxoid (TT) and she was taking iron and calcium supplements throughout the pregnancy. She had no history of raised blood pressure (BP) records, deranged blood sugar profile, and thyroid dysfunction.

Her menstruation cycle was normal (28-30 days intervals, a duration of 7 days), and having average blood flow during menses. She was G_7 P_{4024}, the client had four term deliveries, in which three were normal vaginal delivery and one was cesarean section. She had a history of two abortions at 2.5 month, the reasons of which were not known.

Examination

The patient was conscious, co-operative, and well oriented. On assessment, her vitals were found out to be following pulse rate (PR)-140 bpm, BP-110/70 mmHg, respiratory rate (RR)-20/min, body mass index (BMI)-18.7 kg/m^2. On examination significant findings like pallor, facial edema, pitting edema up to the knee and diastolic murmur in the mitral area were found.

Per abdomen finding suggested fundal height 32 weeks, longitudinal lie, cephalic presentation, uterine contraction (2-3 contraction for 20 seconds per 10 minutes). On per speculum examination bleeding per vaginal (PV) was present, blood clots were seen.

Investigation and treatment

The client's blood group was B positive. The investigation was performed like complete blood count (CBC), liver function test (LFT), kidney function test (KFT), viral markers, genital swab, urine culture, and sensitivity, out of which significant findings like *Acinetobacter baumannii* in genital swab and pseudomonas species in urine culture and sensitivity was found. Other findings were high-sensitivity C-reactive protein (hs-CRP) latex (32.1 mg/l), low serum creatinine level (0.48 mg/dl) and elevated of serum uric acid (12.0 mg/dl).

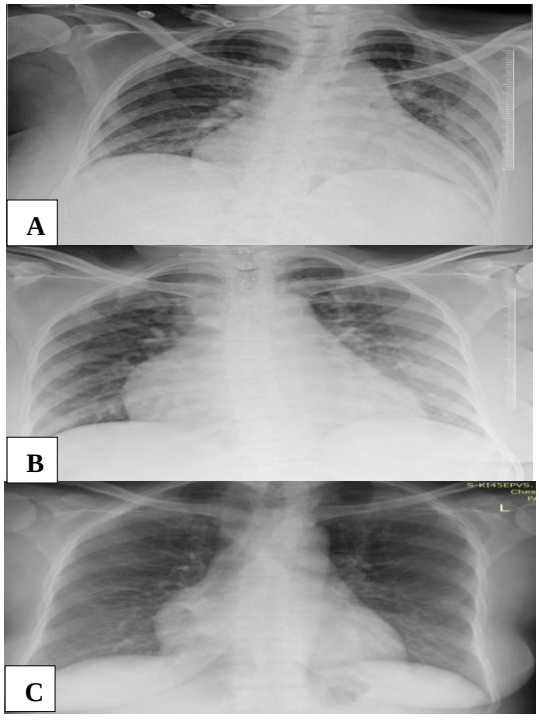

Figure 1: (A and B) Chest X-ray showing lung infiltrate chest X-ray; and (C) during treatment.

She was administered with medication and 5 packed red blood cells (PRBC) (Table 1). After administration of the 6 PRBC patient developed pulmonary edema, then X-ray was performed which showed lung infiltrates and the patient was diagnosed with iatrogenic TRALI and managed with drugs. Apart from these, respiratory management measures like cough syrups, steam inhalation, nebulization were also given.

A nursing intervention like vital sign monitoring, abdominal girth measurements, intake output charting, deep breathing exercise, administration of oxygen, propped up position, provide less salt diet, assist the client in steam inhalation, perform chest physiotherapy were implemented to this patient.

Table 1: Medication details.

S. no.	Medicine category	Medication administered
1	Antibiotics (injection)	Ceftriaxone 1 g
		Metrogyl 100 cc
		Piptaz 2.75 g
		Colistin 9 million IU, stat followed by s4.5 million IU
2	Proton pump inhibitor (injection)	Pantop 1 amp
3	Corticosteroid (injection)	Hydrocortisone 1 vial
4	Antidiuretics (injection)	Lasix 20 mg
5	Anti-emetic (injection)	Emset 1 amp
6	Analgesics (injection)	Dynapar 1 amp
		Brufen 400 mg
7	Anti-hypertensive (tablet)	Telvas 40 mg
		Amlodipine 5 mg
8	Nebulization	Budacort
9	Supplements (tablet)	Protein X powder 2 tsp
		Ferrium 100 mg
		Caloshell 1000 mg

DISCUSSION

TRALI is the leading cause of the transfusion-related injury, and it is reported as 1 in 5000 patient and mortality rate is 5-8%. Transfusion of entire blood, fresh frozen plasma (FFP), platelets, cryoprecipitate can be adjuvant with TRALI.[3] According to Canadian consensus conference, TRALI was categorised in two type, in type 1 there is no risk factor for acute respiratory distress syndrome (ARDS) and it present with acute onset, hypoxemia ($PaO_2/FiO_2 \leq 300$ or $SpO_2<90\%$), clear evidence of bilateral pulmonary edema and no evidence of left atrial hypertrophy or central venous pressure (CVP) <18 mmHg. Patient with type 2nd have risk factor for ARDS, who have mild or baseline ARDS but not diagnosed yet and have stable respiratory status <12 hour before transfusion.[4]

Mechanism behind it, is antigen-antibody (Ag-Ab) reaction, use of aged blood, underlying diseases, cytokines, genetic and endothelial cell injury.[2]

The patient suffering with TRALI, complain about dyspnoea, tachypnoea, fever, cyanosis, and hypotension. Within 2-4 hour of transfusion of blood product, symptoms can be appearing in the patient, even it has been seen after 48 hours of the transfusion in presumed case.[5]

This patient 'X' had, normal temperature, BP (150/70 mmHg), PR (96 bpm), SpO_2 (95%), bilateral lungs infiltrate, cough, and crepts in lung fields. Ranjana et al found falling saturation of oxygen (SpO_2<80%), tachycardia (PR>110 bpm), tachypnoea (RR>30/min.), and normal BP and temperature with dyspnea, bilateral lung infiltrate, and lung lesions in their patient with TRALI.[6] Haji et al found SpO_2 (<80%), PR (>140 bpm), tachypnoea (>30 bpm), fever (100°F), systolic blood pressure (SBP) (<80 mmHg) and lung infiltrates in X-ray.[7] Sherif et al reported chills, fever, tachycardia, dyspnoea, bilateral crepitation, BP (150/90 mmHg), SpO_2 (89%) in their patient.[5]

Clinical manifestation varied with different patients in BP, temperature, pulse, SpO_2 but in case of lung infiltrates in chest X-ray and symptoms like cough, dyspnoea, are similar, and to manage the patient with TRALI, needs to be diagnosed the condition early by clinical manifestation and diagnostic test. We had managed this case successfully because of early identification of symptoms of TRALI and patient 'X' was treated with medication and supportive therapy.

Generally, pulmonary edema in TRALI is non-cardiogenic and sign of volume overload was not available in this condition, but patient 'X' have dilated cardiomyopathy which was diagnosed by X-ray and she also have fluid overload. During or inside 6 h of transfusion, regardless of the amount of blood or blood items transfused, if a patient shows intense beginning dyspnea, clinical differential conclusion of TRALI and TACO ought to be first made.[7] When patient 'X' was showing pulmonary edema, then presence of TRALI was suspected at first and then it was confirmed by the other manifestation and X-ray.

The TRALI can be differentiated from other condition comprising ARDS, pneumonia, cardiac failure, circulatory overload, bacterial contamination and intense haemolytic transfusion reaction.[3] At the end this, study recommended that, nurse should be aware about the symptoms of TRALI and observe the patient carefully during and after the transfusion. It also recommended to conduct a large-scale base descriptive study to find out the risk factor and associate factor of TRALI to expand the knowledge and practice.

CONCLUSION

TRALI is a genuine unfavourable response related with the transfusion of plasma-containing blood products and presents as hypoxemia and non-cardiogenic pneumonic oedema inside 6 hours of transfusion. Health care provider should look on the patient for clinical symptoms at least for 6 hours after the transfusion, if patient reports respiratory difficulty, then suspect it as TRALI and perform the diagnostic test to confirm it. Mortality and morbidity in patient can be reduced by reporting the case to the transfusion center for screening.

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