Transfusion Camp 2023-2024

Day 2: Seminar 2A, November 24, 2023

"Labile Component Reactions", developed by Dr. Sumedha Arya & Dr. Christine Cserti-Gazdewich

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Case 1

An 88 year-old group O+ man with chronic lymphocytic leukemia (CLL) presents to the ER with a 2d history of weakness, oliguria, and chills.

He has a history HTN, CAD, and CHF;

His outpatient medications are ASA, furosemide, ramipril, & metoprolol.

In the ER, BP is 92/60. He is given 1L NS, antibiotics, and antipyretics.

His diuretic and antihypertensives are held.

CBC shows Hb 79 g/L; one month prior his Hb was 100 g/L.

2 units RBC are ordered, each to be given over 1h. A 21 day old unit is hung.

Pre-transfusion vitals: HR 121, BP 100/60, T 37.3 O2 sat 100% R/A

After 1st unit: HR 140, BP 127/72, T 37.3 O2 sat 78% R/A →97% on 2L/min NP.

The 2nd unit is cancelled.

His JVP is at the angle of the jaw, his chest fields have crackles, and bipedal pitting edema is up to the knees. CXR shows bilateral infiltrates with cardiomegaly, in keeping with pulmonary edema.

1. Which of the following might have been his *best defense* against TACO?
   A. Fresh (<14 day old) RBC
   B. Pre-transfusion furosemide
   C. Slower administration of the unit (over 3-4h instead of 1h)
   D. Treatment of his underlying CLL in order to open pulmonary lymphatics

2. Which one of the following is true of TACO?
   A. A RBC unit is more "TACO-genic" than a platelet transfusion
   B. Fever with a suspected TACO argues for another diagnosis
   C. It is the 2nd commonest cause of respiratory transfusion reactions
   D. It is the 2nd commonest cause of transfusion-related death

Case 2

You are called to the hematology ward to review an 87 year old woman admitted with febrile neutropenia after myeloma therapy. She has had 8 previous pregnancies, and also has hypertension.

She experiences fevers, rigors, and tachycardia following a 7-day-old platelet transfusion.

	Pre-transfusion	Post-transfusion
HR	75	110
BP	104/62	130/80
Temp	37.3°C	39.9 °C
RR	16	30
SpO_2	98% (room air)	95% (room air)

Labs:

Pre-transfusion: Hb 68, WBC 0.2, platelets 6

Patient blood group: A+

Platelets transfused: Group O, day 7, single donor apheresis collection

3. Which one of the following is the best possible option for investigation and management of this patient?
   A. hemolysis biochemistry
   B. no investigation needed; already admitted with febrile condition
   C. review chart (temperature trends, antibiotics, cultures)
   D. serology and microbiology (patient & product)

Case 3

An athletic 17 year old male with ALL is undergoing induction chemotherapy (day 3 of the Dana Farber protocol, with no infusion reactions yet). He is hemodynamically stable, afebrile, and on room air.

His CBC today shows WBC 0.4, plt <10, Hb 69.
He is ordered 1 adult dose of platelets and 1u RBC.

The platelet transfusion is completed and the RBC unit is hung.
After 100mL of RBC have been transfused, the patient becomes febrile, dyspneic, tachypneic, and his spO2 drops to 78% on room air.

The transfusion is stopped and he transfers to the ICU.
He is given furosemide and salbutamol with no effect, and requires intubation.
CXR shows new bilateral infiltrates; admitting CXR is unremarkable.

4. Which one of the following is the most likely diagnosis?
    A. atypical pneumonia due to immune compromise
    B. chemotherapy-related ARDS
    C. type 1 ("definite") TRALI
    D. type 2 ("possible") TRALI

5. The patient's parents are upset and want to know why this happened and what can be done to prevent it from happening again. What would you suggest?
    A. antihistamine, acetaminophen, and furosemide reduce severity
    B. irradiation of cellular products prevents TRALI
    C. IVIG and steroid will mitigate recurrence risk
    D. supportive care is mainstay; most recover within 48-96 hours

6. Based on what is known about TRALI, which of the following is the strongest measure by which to protect other recipients?
    A. informing the Transfusion Transmitted Injuries Surveillance System (TTISS)
    B. launching an incident report
    C. placing an alert in the patient's allergy profile
    D. reporting the suspected TRALI to blood bank

Case 4

A 52 year old male was in the OR for a 4-vessel CABG.
He received a 400mg dose of protamine at 17:15,
then 1 dose of platelets, 2u FP, and 1u RBC.
As he was coming off bypass pump, he developed an extensive urticarial rash (75% TBSA) with shock (BP 70-80/40) and bradycardia (20-80).

He had no known history of allergies and no prior exposures to blood products.

He was bolused phenylephrine 40 mcg IV with dopamine at 3 mcg/kg/min IV & norepinephrine at 0.1 mcg/kg/min IV.

He was also given diphenhydramine 50 mg IV + hydrocortisone 100 mg IV.
There were no respiratory/oxygenation changes, with P/F ratio remaining >300 with FiO2 30 – 50% during mechanical ventilation, which was continued, as he had significant airway and peri-orbital angioedema.
On transfer to the CVICU at 19:15, he was hypothermic (33.1°C), and required ongoing boluses, pressors, and inotropes for a period of 12h.

7. Which one of the following investigations yields a result most likely to guide future transfusion advice to the patient?
    A. baseline IgA level and presence of anti-IgA IgG
    B. CBC, PT, aPTT, fibrinogen
    C. culture patient and blood products
    D. repeat blood group, IAT, and DAT

He recovers and is extubated on POD1. He is discharged home on POD7 after an uneventful post-operative course. Laboratory testing reveals evidence of IgA deficiency (on a pre-transfusion specimen) and post-reaction detection of anti-IgA IgG in the patient's serum. Two years later he is back, needing a hip replacement.

8. Which strategy would you adopt for this case?
    A. bloodless surgery
    B. cancel surgery
    C. fractionated blood substitutes
    D. stock 2u washed or IgA deficient RBCs