

Transfusion Reactions - Cases

JASON QUINN, MD, FRCPC



Disclosures

No disclosures

Objectives

1. Identify common clinical features in transfusion reactions
2. Describe a standardized approach to assessing transfusion reactions

Case 1

26 year old woman with history of chronic menorrhagia presents to the emergency department with a history of worsening fatigue and exertional dyspnea. Menorrhagia has been present for years. She had previously seen gynecology and was on the oral contraceptive pill and oral iron, but moved before further follow-up with gynecology and has yet to obtain a family physician in Halifax. Her prescription for both medications expired shortly after moving. She has been sexually active, but has not been using regular contraception.

On examination she appears pale, but otherwise well. Her abdominal, respiratory and cardiovascular examinations are unremarkable.

Vitals: HR 90, BP 96/60, RR20, temperature 36.8C, O2 sat 100% on RA

PmHx: No significant past medical history

Medications: None

Allergies: None

Bloodwork:

CBC reveals a hemoglobin of 62 with an MCV of 65. Pregnancy testing is negative. Remainder of bloodwork is within normal limits.

A decision is made to transfuse her one unit of pRBC prior to further evaluation. The decision was influenced by both the degree of anemia and her symptoms.

30 minutes into the transfusion the patient's blood pressure dropped to 82/59. The other vital signs were unchanged. The transfusion was stopped and a sample was sent to the blood bank. The patient was assessed by the resident in the emergency department.

The blood bank physician was notified and reviewed the case.

Differential Diagnosis

No Transfusion Reaction

Febrile non-hemolytic transfusion reaction

Minor allergic reaction

Severe/anaphylactic/anaphylactoid

Anaphylactic shock

Acute hemolytic reaction

Delayed hemolytic reaction

Delayed serologic transfusion reaction

TA-GVHD

Hemochromatosis

IVIg headache

Bacterial Infection

Viral Infection

Other infection (malaria, babesiosis, etc)

TACO

Transfusion associated dyspnea

TRALI

Possible TRALI

Hypotensive Reaction

Post transfusion purpura

Aseptic meningitis

Unknown

Other

What can we exclude?

Febrile non-hemolytic transfusion reaction

Minor allergic reaction

Viral Infection

Other infection (malaria, babesiosis, etc)

Transfusion associated dyspnea

Delayed hemolytic reaction

Delayed serologic transfusion reaction

TA-GVHD

Hemochromatosis

IVIg headache

What's left?

No transfusion reaction

Severe/anaphylactic/anaphylactoid

Anaphylactic shock

Acute hemolytic reaction

Bacterial Infection

TACO

TRALI

Possible TRALI

Hypotensive Reaction

Unknown

Other

More information

According to the nursing notes the patient was asymptomatic. No skin changes or angioedema were reported. The patient had no respiratory symptoms.

Specifically tightness in throat, dysphagia, dysphoria, hoarseness, stridor, dyspnea, cough, wheezing/bronchospasm, or hypoxemia were noted reported. Flank or back pain were not described. Orthopnea was not described.

On examination the patient appeared well and not cyanotic. Heart sounds were normal. Lungs were clear to auscultation.

Repeat vitals showed the following:

HR 88, BP 100/70, RR18, temperature 37.0C, O2 sat 100% on RA

Clerical Check was normal. DAT was negative, and no hemolysis was observed on reaction sample.

What's gone now?

Severe/anaphylactic/anaphylactoid – Both mucocutaneous signs/symptoms and respiratory symptoms must be present.

Anaphylactic shock – In addition to symptoms above, recipient must experience profound hypotension with loss of consciousness, circulatory collapse or death.

Acute hemolytic reaction- No back/flank pain, DAT negative, clerical check fine, and no hemolysis in tube.

Bacterial Infection – Patient was afebrile and vitals stabilized. As well, transfused RBCs.

TACO – patient is young, no shortness of breath, lungs clear on examination.

TRALI – O2 saturation stable.

Possible TRALI – no risk factors for possible TRALI.

What's left?

No transfusion reaction - the investigation indicated the recipient did not experience a transfusion reaction.

Hypotensive reaction - the recipient experienced a drop in systolic blood pressure by 30 mm Hg and a systolic blood pressure below 80 mm Hg or “shock” during the transfusion or within 4 hours of its completion without any other explanation for hypotension such as bacterial infection, bleeding, or severe allergic reaction.

Other - if the recipient experienced any other type of transfusion reaction.

Unknown - the recipient experienced a reaction that cannot be classified and that represents something new and unexpected and is of clinical significance (i.e. red eye syndrome).

Questions?

Case 2

76 year old man POD #4 for a anterior resection. The surgery and post operative period were uncomplicated, but patient's hemoglobin has been trending downward since admission to hospital. Hemoglobin is now 78 and a decision to transfuse is made. The patient is asymptomatic, but the decision is based on the worsening anemia and the patient's history of cardiovascular disease.

PmHx: Hypertension, type II diabetes, CAD, dyslipidemia, depression, NSTEMI 2 years prior.

Medications: atorvastatin, metformin, metoprolol, ASA, venlafaxin, hydrochlorothiazide

Allergies: Peanuts

The transfusion

The transfusion is completed without complication. Vitals were stable at all checks and the patient appeared well during routine assessment during the transfusion.

2 hour after completion of the transfusion the patient complains of shortness of breath. The on call resident for the floor assesses the patient and a transfusion reaction is filed and blood work is sent to the transfusion lab.

Differential Diagnosis

No Transfusion Reaction

Febrile non-hemolytic transfusion reaction

Minor allergic reaction

Severe/anaphylactic/anaphylactoid

Anaphylactic shock

Acute hemolytic reaction

Delayed hemolytic reaction

Delayed serologic transfusion reaction

TA-GVHD

Hemochromatosis

IVIg headache

Bacterial Infection

Viral Infection

Other infection (malaria, babesiosis, etc)

TACO

Transfusion associated dyspnea

TRALI

Possible TRALI

Hypotensive Reaction

Post transfusion purpura

Aseptic meningitis

Unknown

Other

What can we exclude?

Febrile non-hemolytic transfusion reaction

Minor allergic reaction

Acute hemolytic reaction

Delayed hemolytic reaction

Delayed serologic transfusion reaction

TA-GVHD

Hemochromatosis

IVIg headache

Bacterial Infection

Viral Infection

Other infection (malaria, babesiosis, etc)

Hypotensive Reaction

Post transfusion purpura

Aseptic meningitis

What's left?

Severe/anaphylactic/anaphylactoid

Anaphylactic shock

TACO

Transfusion associated dyspnea

TRALI

Possible TRALI

Unknown

Other

No transfusion reaction

More information

According to the nursing notes the patient was asymptomatic. No skin changes or angioedema were reported.

On examination the patient appeared well and not cyanotic. Heart sounds were normal. Lungs were clear to auscultation.

Repeat vitals showed the following:

HR 80, BP 140/91, RR18, temperature 37.1C, O2 sat 99% on RA

Clerical Check was normal. DAT was negative, and no hemolysis was observed on reaction sample.

The patient was not treated with Lasix. The shortness of breath resolved within a few minutes and the patient remained stable for the remainder of his hospital stay.

What's gone now?

Severe/anaphylactic/anaphylactoid – timeline not consistent with allergic reaction, and no cutaneous signs.

Anaphylactic shock – hypotension is not present.

TACO – No history of CHF, lungs were clear, no increase in their baseline hypertension, no cyanosis, resolved without lasix

TRALI – patient must be hypoxic (<90% on RA)

Possible TRALI - patient must be hypoxic (<90% on RA)

What's left?

Transfusion associated dyspnea - Transfusion Associated Dyspnea (TAD) which is characterized by respiratory distress within 24 hours of transfusion that does not meet the criteria of TRALI, TACO, or allergic reaction. Respiratory distress should not be explained by the patient's underlying condition.

Unknown

Other

No transfusion reaction

Questions?

Case 3

71 year old man with myelodysplastic syndrome who is managed with supportive care including transfusions has blood collected in preparation for an outpatient transfusion.

He was last transfused 26 days ago. He has no history of antibodies.

A type and screen is performed. His screen is positive. An antibody panel is performed, and identifies an anti-K is identified. The patient is negative for this antigen.

Differential Diagnosis

No Transfusion Reaction

Febrile non-hemolytic transfusion reaction

Minor allergic reaction

Severe/anaphylactic/anaphylactoid

Anaphylactic shock

Acute hemolytic reaction

Delayed hemolytic reaction

Delayed serologic transfusion reaction

TA-GVHD

Hemochromatosis

IVIg headache

Bacterial Infection

Viral Infection

Other infection (malaria, babesiosis, etc)

TACO

Transfusion associated dyspnea

TRALI

Possible TRALI

Hypotensive Reaction

Post transfusion purpura

Aseptic meningitis

Unknown

Other

Now what?

Patient's DAT is presently negative

Previous screen was negative

No LDH, haptoglobin, or indirect bilirubin has been ordered on the patient in the past month. A repeat CBC shows his hemoglobin at his baseline of 80 pre-transfusion. This is his most recent CBC since the last transfusion.

Previous transfusion was completed without issue.

Hemolytic Reaction

Hemolytic reactions cause the destruction of red blood cells, as evidenced by a drop in hemoglobin, an increase in indirect bilirubin and in LDH. Accompanying clinical signs and symptoms may occur such as fever, back pain, and dyspnea.

Acute

If the recipient experienced a hemolytic reaction within 24 hours of the receipt of the transfusion.

Delayed

If the recipient experienced a hemolytic reaction more than 24 hours and up to 1 month following the transfusion.

Delayed Serological Transfusion Reaction (new alloantibodies)

If the recipient developed new alloantibodies in the 28 days following a transfusion with or without positive Direct Antiglobulin Test (DAT) but no clinical or laboratory signs of hemolysis.

What next?

Current CBC shows hemoglobin of 80 which is typical prior to transfusion for this patient.

A LDH and indirect bilirubin are ordered and are both within normal limits.

Questions?
