BLOOD TRANSFUSION REACTION

MODULE: CRITICAL INCIDENTS

TARGET: ALL ANAESTHETISTS

BACKGROUND:

Serious blood transfusion reactions are rare but important entities which anaesthetists must be able to manage. The most recent report from SHOT and the MHRA revealed nearly 2200 serious adverse reactions between Nov 2005 and Dec 2010, of which the most common reaction was anaphylaxis/hypersensitivity.

(NB: This scenario is designed to be utilised in tandem with BL_CRIT_20 Major Haemorrhage, as the follow-on scenario after institution of measures to deal with a significant bleed).

RELEVANT AREAS OF THE ANAESTHETIC CURRICULUM

| IO_BS_07 | Demonstrates role as team player and when appropriate leader in the intra-operative environment |
| IO_BS_08 | Communicates with the theatre team in a clear unambiguous style |
| IO_BS_09 | Able to respond in a timely and appropriate manner to events that may affect the safety of patients [e.g. hypotension, massive haemorrhage] |
| CI_BK_01 | Cardiac and/or respiratory arrest |
| CI_BK_02 | Unexpected fall in SpO$_2$ with or without cyanosis |
| CI_BK_03 | Unexpected increase in peak airway pressure |
| CI_BK_08 | Unexpected hypotension |
| CI_BK_19 | Bronchospasm |
| CI_BK_22 | Adverse drug reactions |
| CI_BK_23 | Anaphylaxis |
| CI_BK_24 | Transfusion reactions, transfusion of mis-matched blood or blood products |
| CI_BS_01 | Demonstrates good non-technical skills such as: [effective communication, team-working, leadership, decision-making and maintenance of high situation awareness] |
| CI_BS_02 | Demonstrates the ability to recognise early a deteriorating situation by careful monitoring |
| CI_BS_03 | Demonstrates the ability to respond appropriately to each incident listed above |
| CI_BS_04 | Shows how to initiate management of each incident listed above |
| CI_BS_05 | Demonstrates ability to recognise when a crisis is occurring |
| CI_BS_06 | Demonstrates how to obtain the attention of others and obtain appropriate help when a crisis is occurring |
| CI_IS_01 | Demonstrates leadership in resuscitation room/simulation when practicing response protocols with other healthcare professionals |
| CI_IS_02 | Demonstrates appropriate use of team resources when practicing response protocols with other healthcare professionals |
INFORMATION FOR FACULTY

LEARNING OBJECTIVES:

- Safe commencement of blood product transfusion.
- Recognition of possible drug reaction or blood transfusion reaction.
- Management of possible blood transfusion reaction.

SCENE INFORMATION:

- Location: Anaesthetic Room / Theatre

This scenario can either commence with the patient anaesthetised on the operating table, or in the anaesthetic room awaiting induction. The patient is consistently hypotensive after induction and only transiently responsive to fluid and vasopressors.

Surgeons are very keen to commence surgery immediately. Once surgery commences, the surgeons inform the anaesthetic team that there is a significant amount of blood in the abdomen and that they will likely have to convert to a laparotomy.

EQUIPMENT & CONSUMABLES

<table>
<thead>
<tr>
<th>Equipment &amp; Consumables</th>
<th>Persons Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Manikin – On trolley/bed</td>
<td>Anaesthetic/ACCS junior trainee</td>
</tr>
<tr>
<td>Checked anaesthetic machine with circle circuit</td>
<td>Anaesthetic assistant</td>
</tr>
<tr>
<td>Stocked Airway trolley</td>
<td>Anaesthetic Senior Trainee</td>
</tr>
<tr>
<td>- Laryngoscopes (2 x Macintosh)</td>
<td>Surgeon – aggressive and pushing to start surgery</td>
</tr>
<tr>
<td>- ET Tubes (Various Sizes)</td>
<td>Scrub nurse</td>
</tr>
<tr>
<td>- OP, NP and Advanced Supraglottic airways (iGels, LMAs)</td>
<td></td>
</tr>
<tr>
<td>Anaesthetic drugs drawn up</td>
<td></td>
</tr>
<tr>
<td>Simulated blood for transfusion</td>
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PARTICIPANT BRIEFING: (TO BE READ ALOUD TO PARTICIPANT)

Laura Westall is a 28 year old woman undergoing a laparoscopic salpingectomy for suspected ectopic pregnancy. She has a positive pregnancy test, and increasing abdominal pain. She has become mildly pyrexial and tachycardic (110bpm) in the last few hours. She has a mildly elevated white cell count, and otherwise normal bloods.

She has suffered from fairly frequent urinary tract infections and other minor infections, but has had no serious illnesses. There are no allergies of note.

‘VOICE OF MANIKIN’ BRIEFING:

You are anxious and in quite a lot of lower abdominal pain. The surgeons have told you that you probably have an ectopic pregnancy and that they need to investigate with a diagnostic laparoscopy.

You are a previously fit and well 28 year old. You have suffered from frequent urinary tract infections and sinusitis, but never any serious infections. No allergies. Last ate 2 hours ago.
### OTHER IN-SCENARIO PERSONNEL BRIEFING:

**Anaesthetic Assistant:**
Assist the anaesthetist in inducing the patient and ‘transferring’ the patient to theatre. The patient is hypotensive post-induction which is only transiently responsive to fluids and vasopressors.

At some stage the anaesthetist should ask for blood to transfuse the patient – do not offer to check this in (leave it to the anaesthetist). There will be a transfusion reaction regardless of whether the blood is checked properly.

**Voice of Telephone Help:**
Consultant anaesthetist will arrive in 20 mins.

**Blood Bank:**
If the participant calls blood bank for advice, they are advised to keep the bag of blood under suspicion, and take 2 group and save samples from the patient, and label the samples with ‘?blood transfusion reaction’.
After the blood transfusion reaction, any further blood they provide will be red cells washed in saline.

### ADDITIONAL INFORMATION

Patients with hereditary IgA deficiency are at a higher risk of developing hypersensitivity and anaphylactic reactions to transfused blood – as they possess anti-IgA antibodies that react against the IgA in transfused blood. These patients should receive blood that is washed in 0.9% saline first. Hereditary IgA deficiency may be asymptomatic, but may manifest as a predisposition to bacterial infections resulting in frequent minor infective ailments.
CONDUCT OF SCENARIO

INITIAL SETTINGS
A: Patent and Self-maintained
B: RR 28/min, SpO2 99% on O2, Equal air entry
C: HR 110. BP 110/85.
D: Anxious

INDUCTION
A: Own until intubated
B: RR falls to 0 during induction until participant takes over ventilation.
C: HR 115, BP 70/40 over 2 mins. Only transiently responsive to fluids or vasopressors.
D: Eyes closed. Seizures start. Pupils equal.

EXPECTED ACTIONS
• Call for help & secure additional IV access if required
• Continue aggressive fluid resuscitation
• Contact blood bank, organise X-matched blood. Take FBC, U&Es, Clotting, ABG
• Consider activating major haemorrhage protocol.
• Check in blood
• Commence transfusion with fluid

AFTER TRANSFUSION
A: Intubated
B: As per ventilator settings. SpO2 falls to 90% over 4 mins. Airway resistance increases. Wheeze.
C: HR 160, BP 50/20.
D: Unresponsive.
E: Widespread red flushing (ODP prompts this)

EXPECTED ACTIONS
• Recognise possible blood transfusion reaction,
• Stop blood. Save bag to return to lab.
• Treat as anaphalaxis: Elevate legs, resuscitate with crystalloid, small increments of IV adrenaline or 0.5mg IM adrenaline and consider infusion, IV Chlorphenamine and IV Hydrocortisone.
• Contact Blood bank or haematology for advice as is necessary.

LOW DIFFICULTY
Surgeon establishes haemostasis.
Haemodynamics improve with appropriate anaphalaxis treatment.

NORMAL DIFFICULTY
Haemodynamics improve with appropriate anaphalaxis management
Ongoing blood transfusion required and bleeding ongoing.

HIGH DIFFICULTY
No response to adrenaline (Inadequate circulating volume)
Cardiac arrest ensues.
Further blood resuscitation required during arrest

RESULTS
ABG:
pH 7.32
pO2 35
pCO2 5
HCO3 21
BE -4
Lact 3.2
Hb 6.8
K 3.2
Glu 7.2

EXPECTED ACTIONS

RESOLUTION
At faculty discretion.

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Editor: Dr Andrew Darby Smith
Original Author: Dr P Shanmuha
Anaesthesia

Critical Scenario (BL)

Version 9 – May 2015

Editor:
Dr Andrew Darby Smith

Original Author:
Dr P Shanmuha

Nil Known 2 hours ago

Hb 10 NAD

INR 1.0

Pelvis USS:
- Cystic collection on right adnexae? Ectopic

Previous ERPC – GA OK

Frequent UTIs and sinus related infections

Nil of note

Airway Assessment

Mouth Opening:
MP Score: 1 2 3 4

Jaw:
Neck: MP1, Good neck and jaw ROM

TEETH

8 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 8

8 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 8

X = missing
L = loose
B = bridge
C = caps / crowns
D = damaged

Nil Known

ALLERGIES

CONSENT:

GA

Sedation

Epidural

Spinal

Regional

Suppository

Notes / Discussion / Technique proposed:

Anaesthetic Information leaflet received by patient

For attention of ward staff: (further investigations, fasting, continue/omit current medication, etc.)
DEBRIEFING

POINTS FOR FURTHER DISCUSSION:

- Safe commencement of blood product transfusion.
- Recognition of possible drug reaction or blood transfusion reaction.
- Management of possible blood transfusion reaction.

DEBRIEFING RESOURCES


3. FRCA.co.uk resource on transfusion reactions [http://www.frca.co.uk/article.aspx?articleid=100094]


KEY POINTS:

- Safe commencement of blood product transfusion.
- Recognition of possible drug reaction or blood transfusion reaction.
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RELEVANCE TO AREAS OF THE ANAESTHETIC CURRICULUM

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FURTHER RESOURCES


3. FRCA.co.uk resource on transfusion reactions
   http://www.frca.co.uk/article.aspx?articleid=100094

4. AAGBI Safety Drill: Management of a Patient with suspected anaphylaxis during anaesthesia.
   (Revised 2009)

5. AAGBI Safety Guideline: Suspected Anaphylactic Reactions Associated with Anaesthesia (July 2009)
   http://www.aagbi.org/sites/default/files/anaphylaxis_2009_0.pdf
PARTICIPANT REFLECTION:

What have you learnt from this experience? (Please try to list 3 things)

How will your practice now change?

What other actions will you now take to meet any identified learning needs?
PARTICIPANT FEEDBACK

Date of training session: ..................................................................................................................

Profession and grade: ..........................................................................................................................

What role(s) did you play in the scenario? (Please tick)

- Primary/Initial Participant
- Secondary Participant (e.g. ‘Call for Help’ responder)
- Other health care professional (e.g. nurse/ODP)
- Other role (please specify):
- Observer

<table>
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<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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<tbody>
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<td>I found this scenario useful</td>
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<td>I understand more about the</td>
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Please write down one thing you have learned today, and that you will use in your clinical practice.

How could this scenario be improved for future participants?
(This is especially important if you have ticked anything in the disagree/strongly disagree box)
FACULTY DEBRIEF – TO BE COMPLETED BY FACULTY TEAM

What went particularly well during this scenario?

What did not go well, or as well as planned?

Why didn’t it go well?

How could the scenario be improved for future participants?