Complications of Repeated Transfusions

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Why Repeated Transfusions?

- β- Thalassaemia major
- Sickle-cell anaemia
- Others
  - Haemophilia, leukaemia etc.
Transfusion-Related Fatalities

Figure 1: Transfusion-Related Fatalities by Complication, FY2008 through FY2012

Transfusion-Related Fatalities

- TRALI
- Alloimmunization
  - \( \times \) with SCA
  - MDS/CMML
  - \( \uparrow \) difficulty of finding compatible RBC units
- Bacterial Contamination
  - Platelets: stored at 22°C \( \rightarrow \) bacterial growth
  - Phlebotomy
  - Preventive measures
- Iron Overload
  - Commonly seen in congenital HA
  - Treatment: iron chelators (DFO)
    - \( ? \) Other problems
  - Hypertransfusion of neocytes
Case Study

- Patient history
  - 46 year old woman
  - Laparotomy in the ICU
  - One unit of packed red blood cells

- Clinical symptoms
  - Within 20-25 minutes
  - Breathlessness, chest discomfort, hypotension, etc.

<table>
<thead>
<tr>
<th>oxygen saturation</th>
<th>systolic BP</th>
<th>tachycardia</th>
<th>tachypnoea</th>
<th>mild fever</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;80%</td>
<td>&lt;80 mmHg</td>
<td>&gt;140/minute</td>
<td>&gt;30/minute</td>
<td>100°F</td>
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</tbody>
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- Non-specific
Case Study

- Chest X-ray
  - Bilateral pulmonary infiltrates

- Hemodynamic parameters
  - Progressively worsened

→ Non-specific

- Treatment
  - Ventilatory and vasopressor support
  - Recovered: next 72 hours
Case Study: TRALI

- Diagnosis
  - TRALI suspected
  - Based on:
    - History, clinical features, and the response to supportive management

PLUS exclusion of other causes

- Transfusion Mismatch
- Myocardial Infarction
- Pulmonary Embolism
- Fluid Overload
What is TRALI?

- Transfusion-related Acute Lung Injury (First coined in 1985)
- Incidence reported approx. 1:10,000; female/severe illness
- Highest fatality

Figure 2: Reports of TRALI Cases by Implicated Blood Product, FY2005 through FY2010

Transfusion-related Acute Lung Injury (TRALI)

- Pathogenicity
  - Priming + Activation $\rightarrow$ Capillary endothelium damage

- Cholesterol crystals

<table>
<thead>
<tr>
<th>Symptoms:</th>
<th>Treatment &amp; Prognosis:</th>
<th>Diagnosis</th>
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<tbody>
<tr>
<td>Non-specific: chills, cough, fever, cyanosis and hypotension ($\leq 6$ hours after transfusion)</td>
<td>Stop transfusion</td>
<td>Blood transfusion ($\leq 6$hrs)</td>
</tr>
<tr>
<td></td>
<td>Supportive</td>
<td>Exclusion</td>
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<td></td>
<td></td>
<td>anti-HLA or anti-HNA**</td>
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What to Do if TRALI Suspected?

✓ Notify blood bank/blood supplier
✓ Anti-HLA and anti-HNA screening
✓ Further donation?? Defer donors
  ● Granulocyte antibodies
  ● HLA Class I or II antibodies
  ● The only donor in a TRALI case

● TRALI reduction strategy:
  ● Implementation of the donor selection
Acknowledgements

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References


