‘Cold Agglutinin-Induced Haemolytic Anemia’
- Challenges in Immunohaematology

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- Hb 38g/L
- Emergency Transfusion of O red cells
- Dramatic haemolysis
- Cardiovascular Shock
- Death

- Pre-transfusion testing found presence of cold agglutinins
- High cold agglutinins titre levels with anti-H antibodies in the patient’s blood reacted with H antigen in universal O red cells.
- Concluded risk of emergency transfusion should be assessed against risk of delaying transfusion until pre-transfusion tests are completed.
AIM

★ Present two cases of Cold Agglutinin Induced Haemolytic Anaemia

★ Discuss and learn from peers - challenges that can be posed by cold agglutinins

★ Always happy to learn....
Cold Agglutinins

★ Cold antibodies, which are often IgM, can cause both red cell agglutination and complement mediated haemolysis

Cold Exposure

Body Temperature Decreases (as low as 28 degrees in the extremities)

Cold Autoantibody Activated

- Clinical features such as cyanosis and ischaemia due to haemolysis or red cell agglutination
- Infections, eg Mononucleosis, Mycoplasma pneumoniae may also result in cold antibody production
- Warming blood at 37 °C usually resolves cold agglutinins. However some severe cases are unresolved.
CASE 1

★ 52 yr old female

★ hypothyroid, SOB on exertion for 2 months, previous Vit B12 deficiency

★ FBC - Cold Agglutinins flagged by analyser

- Hb 55 (previously 145, 4 months prior)
- WCC 4.1, Plt’s 286
- Sampled warmed, cold agglutinins not resolved MCHC =432 (RR 320-360)
- Spun Hct 0.23 (no change from automated result)
- LDH 1004 (RR 0 - 430)
Dr notified, patient admitted to emergency department

Repeat FBC - similar results

Haemolysis screen requested - Reticulocytes (unable to perform)
  - Haptoglobin
  - DAT (+ve, polyspecific)

Blood Film: Polychromasia, auto agglutination, occasional spherocytes

Group and Hold - O Positive
  - Autoantibody detected with pan reactivity

UNABLE TO CROSSMATCH COMPATIBLE UNITS

Haematologist advice ‘TRANSFER PATIENT TO LARGER INSTITUTION’
★ Patient transferred to a larger institution

★ Similar results on arrival - Hb = 40
    - Haptogloblin = <0.10 (RR: 0.30-2.00)

★ Mycoplasma Pneumoniae identified as causing the cold antibody induced haemolytic anaemia

★ Cold Agglutinins not resolved ➔ Transfused incompatible crossmatched blood
    Rh and K matched
    Blood warmer

★ OUTCOME: Patient recovered well as infection resolved
CASE 2

★ 76 yr old Female

★ No clinical notes

★ 20/06/17 : INR - 3.5

★ 28/06/17

FBC - Hb 66 (previously 126, 01/06/17)

- Cold Agglutinin Flag  MCHC=377 (RR 320-360)

- Cold Agglutinins resolved on warming, MCHC 345
Blood Film: Polychromasia, occasional spherocytes, agglutination

DAT: +ve, polyspecific

GP notified $\rightarrow$ GI bleed $\leftrightarrow$ ? over warfarinised $\rightarrow$ ?dark stools

INR no $> 3.5$ recorded  no FOB’s received

Laboratory Findings $\rightarrow$ Cold Antibody Induced Haemolytic Anaemia

Subsequent laboratory testing: Full haemolysis screen together with Mycoplasma pneumoniae
Haematologist advice: TRANSFER PATIENT TO LARGER INSTITUTION

GP Continued to investigate GI bleed → Colonoscopy

Intravenous Iron Infusion per Surgeon

Crossmatch 3 units requested by Anaesthetist

**VERY RISK**
- Increased risk of bleeding during surgery
- Limited Blood Stock
- Limited Laboratory Resources
- Severity of haemolysis - lab findings
- Remote Location and Retrieval if required
Cold agglutinins resolved on warming ➔ Pre-warmed technique tubes and BioVue

No Antibody Detected

3 compatible units found

Patient transfused using blood warmer

★ OUTCOMES:  Cause of cold agglutinins never investigated
Faecal Occult Blood was never determined
No evidence of a GI bleed
No immediate follow up of Hb post transfusion and surgery
DISCUSSION

★ Always room for improvement

★ ? Protocols for resolving cold agglutinins

★ Unresolved cases BUT urgent results needed eg. Blood Transfusion

★ Laboratory findings vs. Clinicians diagnosis
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★Moree SydPath staff
References


