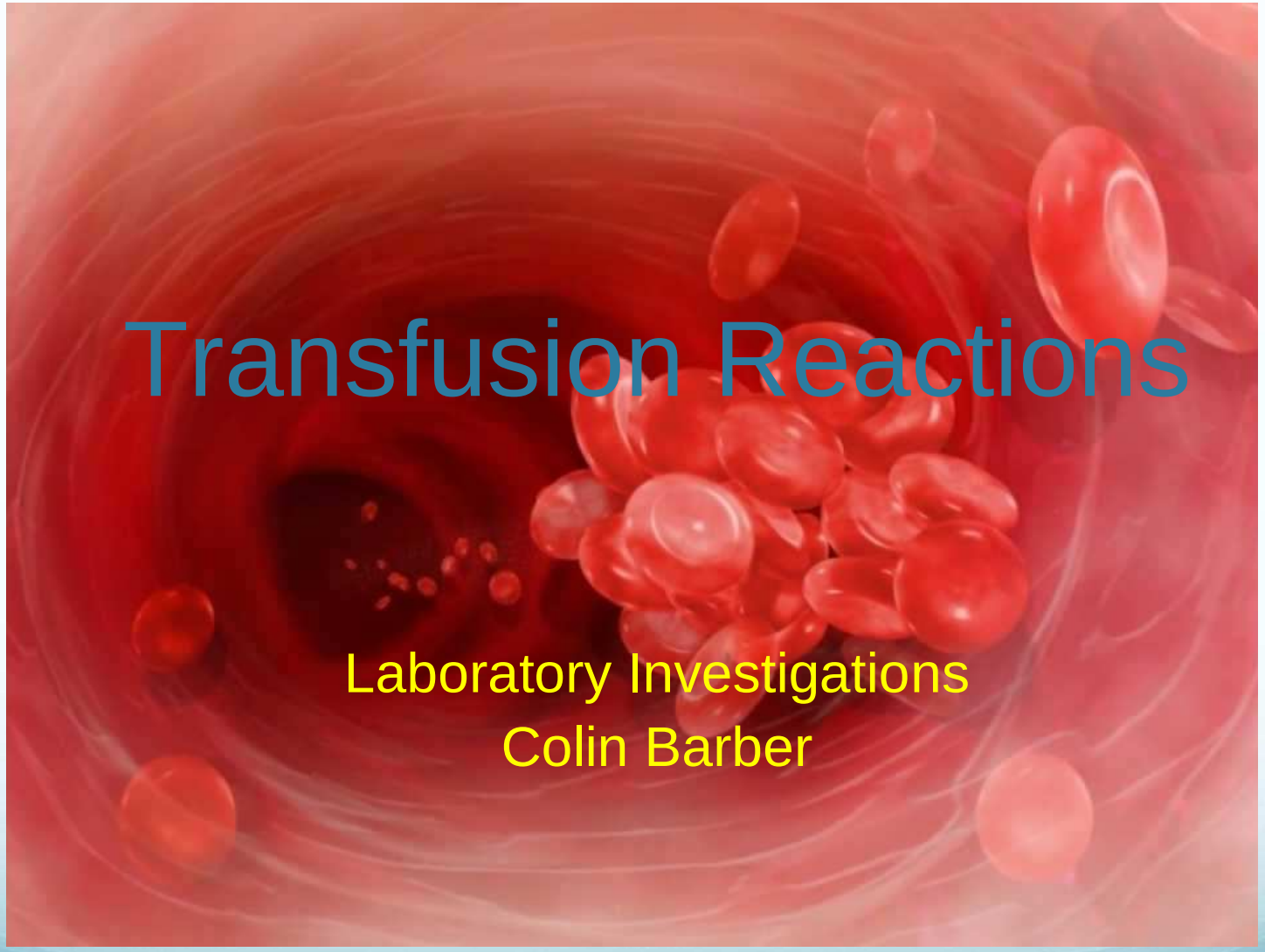


Transfusion Reactions

Laboratory Investigations

Colin Barber

About Me

- I Started work in 1976 as Junior A MLSO and my career progressed to being a Blood Manager and also a period as Transfusion Practitioner
- I have worked at 4 teaching Hospitals, 3 DGH and NHSBT
- I am currently Employed by HSL at the Royal Free Hospital in Hampstead.

Topics to be covered

- Acute Haemolytic Reactions
- Delayed Haemolytic Reactions
- Febrile non-haemolytic transfusion reaction
- Allergic reactions

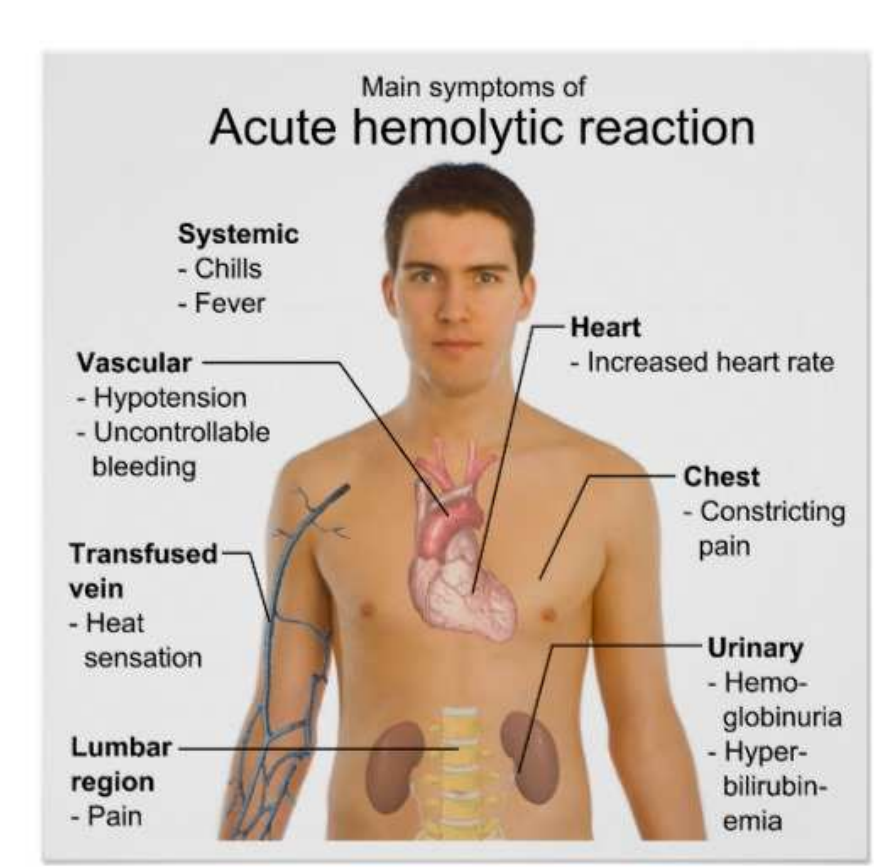
Topics to be covered

- Transfusion-related acute lung injury (TRALI)
- Post Transfusion Purpura

Acute Haemolytic Reactions

- Occurs during or immediately after transfusion
- Intravascular Destruction of transfused RBC’s
- Almost all are caused by transfusion of ABO incompatible red cells.
- Usually caused by an error
- 3 ABO incompatible transfusions in the 2016 SHOT report

Acute Haemolytic Reactions



Investigation

- As most AHR are due to errors
- Check that the unit was transfused to the intended patient
- Check labelling of the unit

Investigation

- Repeat group & screen on pre & post-transfusion samples
- DAT on pre & post-transfusion samples
- Crossmatch transfused units on pre & post-transfusion samples

Investigation

- Check post transfusion FBC – Hb & Platelets
- Clotting Screen
- D-Dimer
- AHR may cause DIC
- Haptoglobin

Investigation

- Bilirubin
- LDH
- U&E &LFT’s
- Urine examined for free Hb
- Examine plasma for free Hb

Delayed Haemolytic Reactions

- Several days after transfusion
- Extravascular destruction of transfused RBC's
- Often sub clinical and picked up when Hb post transfusion drops.
- Often due to RBC antibody level becoming sub detectable

Investigation

- Repeat group & screen on pre & post-transfusion samples
- DAT on pre & post-transfusion samples
- Crossmatch transfused units on pre & post-transfusion samples

Investigation

- If the post transfusion antibody screen is positive – Identify antibody
- Phenotype pre-transfusion sample
- Check the phenotype of the transfused units
- The antibody that is often implicated is anti-Jka

Investigation

- Post transfusion FBC
- Bilirubin
- LDH
- U&E
- LFT

Febrile non-haemolytic transfusion reaction

- One of the most common causes of transfusion reactions
- Moderate NHFTR:-Temperature rise >2^{o}C above base or ≥ 39^{o}C
- Less frequent since the implementation of universal leucodepletion.
- Can be caused by antibodies to WBC
- Can also be caused by transfusion of pro-inflammatory substances including cytokines, complement fragments, and lipid compounds

Investigation

- If there has not been a clerical error and the right blood product has been transfused to the right patient and the possibility a red cell antibody can be excluded.
- There must be a medical assessment of the patient to confirm it is a FNHTR.
- Then no further Laboratory investigation are required.

Investigation

- Although the FNHTR are often caused by WBC antibodies BSH ATR guidelines don’t recommend routine testing for HLA or Platelet specific antibodies.
- The guidelines state:-
- Testing for leucocyte, platelet and neutrophil-specific antibodies should be reserved for patients with evidence of refractoriness and/or who do not respond to plasma reduction as management of reactions

Allergic Reactions

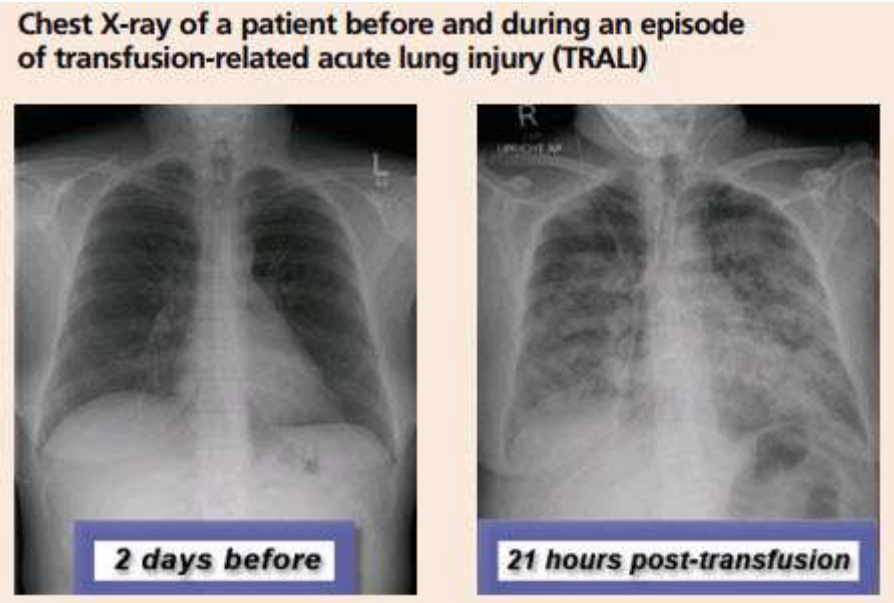
- Moderate or severe allergic reactions can be caused by antibodies to IgA in IgA deficient recipients.

- Can be caused by other allogens in the donated units.
- Antibodies to Haptoglobin in Haptoglobin deficient recipients.

Investigation

- Measure IgA levels
- Test for IgA antibodies
- Measure serum levels of mast cell tryptase (MCT)

Transfusion Related Acute Lung Injury (TRALI)

- Caused by by HLA antibodies & anti-Neutrophil antibodies present in donated plasma
- X-Ray Evidence of bilateral patchy alveolar infiltrates supports the diagnosis
- 

Investigation

- Report to NHSBT for investigation of the implicated donations
- Donors tested for HLA and HNA antibodies

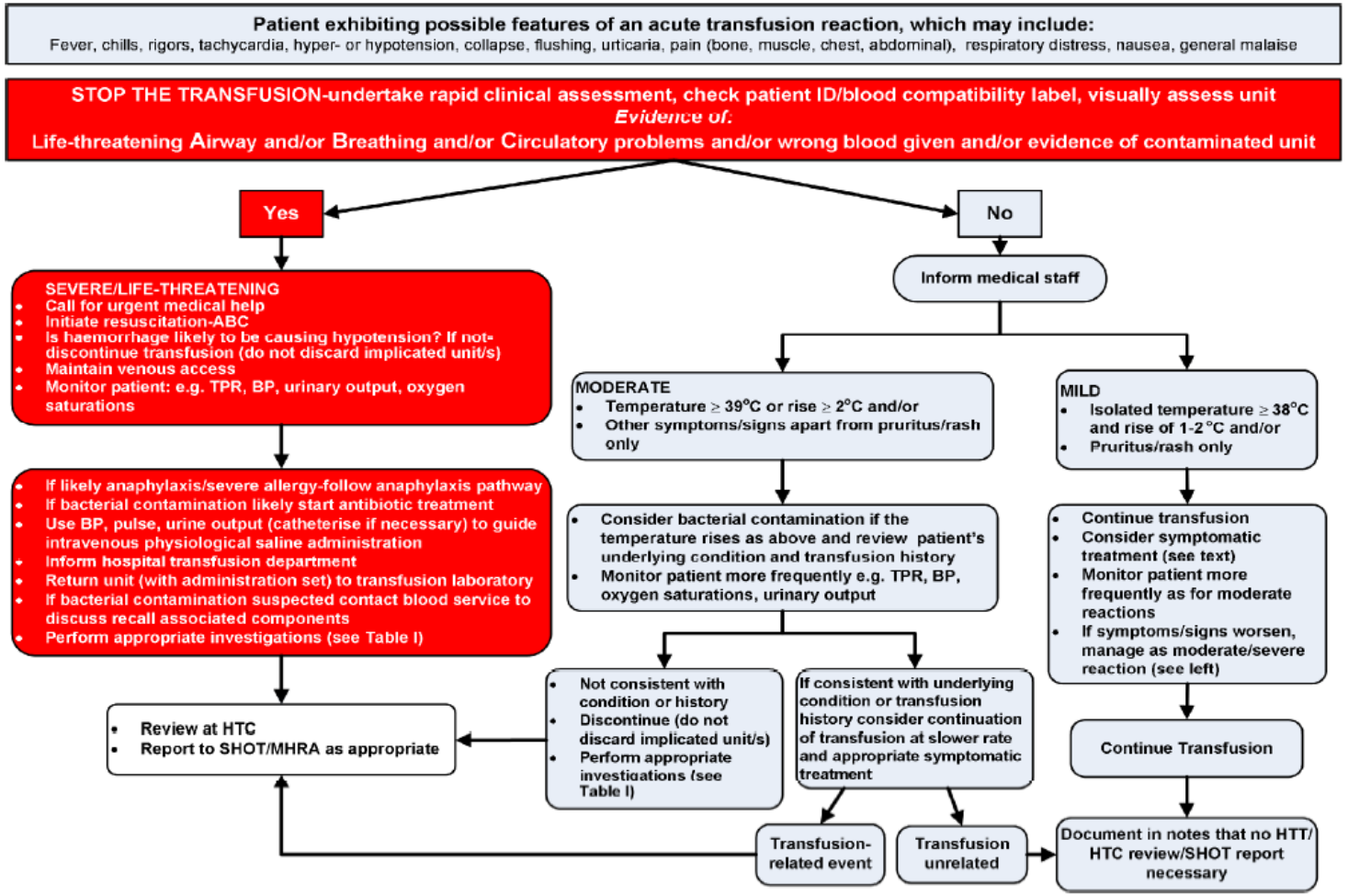
Post Transfusion Purpura

- Acute thrombocytopenia following transfusion
- Most commonly in found in female patients
- Much less common since the introduction of universal leucodepletion.
- Thrombocytopenia in PTP is caused by antibody mediated destruction of both donor platelets as well as patient's own platelets

Investigation

- Send samples to NHSBT for HPA antibody investigation.
- PTP is confirmed by the demonstration of IgG alloantibodies in the patient's serum against one of the HPA antigens.

Figure 1 Flow Diagram for recognition, initial management and subsequent management and investigations.



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