TACO and other complications of transfusion

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Haemovigilance definition

- Surveillance procedures from the collection of blood and its components to the follow up of the recipients
- To collect and assess information on unexpected and undesirable effects resulting from the therapeutic use of labile blood components
- And to prevent their occurrence or recurrence
Haemovigilance in the UK

**MHRA**

Medicines & Healthcare Products Regulatory Agency

- Competent Authority’ for the BSQR 2005
  - QMS in blood establishments and hospital blood banks.
- Competent Authority for the Medicines Act 1968
- Competent Authority for the Medical Devices Regulations 2008
- **STATUTORY** reporting

**SHOT**

Serious Hazards of Transfusion

- Confidential enquiry
- Serious adverse reactions/events AND near misses all of which occur in BOTH a laboratory and CLINICAL environment.
- **PROFESSIONALLY MANDATED** reporting
• **Deaths where transfusion was causal or contributory n=15**
  - 2 definitely related to the transfusion
    (1 haemolytic transfusion reaction (HTR), 1 Transfusion–associated circulatory overload (TACO))

• **Major morbidity n=169**
  - Mainly acute transfusion reactions (allergic/severe febrile)

• **TACO was associated with 36 cases of major morbidity** and contributed to 6 deaths
  (1 definitely related, 3 probably related, 2 possibly related)

• In 42/91 (46.2%) cases of TACO the patient had a poor outcome

• **ABO incompatible red cell transfusions n=10**
  - 1 major morbidity
  - all due to clinical errors in collection and administration or administration alone
Cases reviewed 2014

Pathological reactions which may not be preventable

Probably/possibly preventable with improved practice and monitoring

Preventable errors
Transfusion-associated circulatory overload (TACO)

Current ISBT definition:
Any 4 of the following within *6 hrs of transfusion

- Acute respiratory distress
- Tachycardia
- Increased blood pressure
- Acute or worsening pulmonary oedema
- Evidence of positive fluid balance

International definition currently under review as it is unsatisfactory

*SHOT have received reports of TACO up to 24 hours post transfusion
Assessment for transfusion

- Are the full blood count results correct? Do they fit with the clinical picture?
- Does the patient need further investigations?
- Risk v benefit of transfusion
- Patient age, weight and general condition
- Does the patient have risk factors for TACO?
- Is conservative management more appropriate?
- Communication – identifies patients who may have specific requirements
Risk factors for TACO

- Age > 70 years although TACO is seen in younger patients
- Concomitant medical conditions e.g.
  - cardiac failure
  - renal impairment
  - fluid overload
  - hypoalbuminaemia
- Low body weight
- Too rapid transfusion

Please see addendum to BCSH guidelines on the administration of blood components (published 2012)
Case Study 1

- A 71 yr old female patient on regular transfusion support for auto immune haemolytic anaemia (AIHA) was admitted for a 2 unit red cell transfusion as a day case.
- Transfused between 09:40 and 14:05hrs – average transfusion duration 2hrs 10mins.
- Patient was known to have AF and bilateral valve disease.
- The patient returned to another hospital unwell at 15:00hrs and at 15:10 became very short of breath with raised blood pressure.
- Crash call made and patient re-admitted to acute hospital via A&E.
Baseline BP 136/60mmHg rising to 209/116mmHg

Chest x-ray revealed pulmonary oedema

ECG – AF

Treated with salbutamol, O2 and 2 x 50mg doses of furosemide

Made a full recovery

Key recommendation

Advice for patients

Day case or outpatient transfusions: with the need for increased emphasis on day case and community care, patients receiving blood transfusions need to be given printed advice, be advised to report any symptoms or complications and provided with a 24-hour contact number

Made a full recovery
Avoidable, delayed or under transfusion – common issues

- Transfusion may not be the optimal management for all patients
- Incorrect full blood count results
  - dilute, poor sampling or wrong blood in tube
- Delayed decision making
- Communication failures
- Inappropriate management of iron or other haematinic deficiency
Case Study 2

- A full blood count sample was received on routine transport from a health centre.
- The clinical details included ‘shortness of breath’ and the Hb was 45g/L.
- As the sample was received after routine hours, the result was telephoned to the on-call GP service.
- The patient was not admitted to hospital until 6 days later.
- A repeat Hb confirmed the low result, and resulted in an urgent request for a 3 unit red cell transfusion which was started within 2 hrs.
Case Study 3

- 75 year old patient with unilateral swollen leg had a full blood count sample taken by the GP
- Result Hb 76g/L was relayed to the out-of-hours (OOH) service provider
- The OOH had a consultation with the patient advising immediate admission to MAU and a 2 hour ambulance had been booked
- Patient was asymptomatic of anaemia
- Patient admitted to MAU and 2 unit red cell transfusion prescribed
Case Study 3
contd.

- Group and screen, crossmatch and full blood count commenced 07:14hrs
- 1st unit commenced 09:55hrs—before results checked
- Repeat full blood count results Hb 114g/L @ 06:28
- Unit stopped @ 11:20hrs when ITI realised result from GP was spurious

**Root cause of the error?**

The sample was taken into a syringe and GP then walked 10 minutes from patients house to the surgery

The sample was decanted into a tube and then labelled

It is thought the sample must have clotted in the syringe
Case Study 4

- A cross match blood sample was taken by the community team.
- The result was determined to be different from the historic group.
- The investigation showed the sample had been mistakenly taken from the person living next door to the patient (wrong blood in tube).
- The second individual had not questioned the nurse as he himself was awaiting a nurse to give him an injection.
Haemolytic transfusion reactions

- These can be acute (within 24 hrs) or delayed (up to 14 days)
- Particularly common in patients with haemoglobin disorders
- The first presentation may be in the community
Case 5

- An elderly woman with myelodysplastic syndrome received 2 units of red cells on the haematology day unit with no ill effect.
- Eight days later she began to experience loin pain and passed black urine, which continued for 5 days.
- The primary care team prescribed antibiotics, but did not take a urine sample or report this to a haematologist.
- It was not until 3 weeks later, when the patient returned to the day unit for an appointment that a DHTR (due to anti-c) was diagnosed.
Reporting adverse incidents

- GMC ‘Encouraging a learning culture by reporting errors’
- Duty of candour
- CQC now interested in transfusion events
- ABO incompatible transfusions are now ‘Never events’ – NHS England
Resources

Resources available on the web: www.shotuk.org

- Annual reports and summaries
- Clinical and laboratory lessons
- Reporting definitions
- Benchmarking data
- Case studies
- SHOT bites