LAboratory errors in Transfusion

Jenny Berryman, Hema Mistry and Paula Bolton-Maggs from the Serious Hazards of Transfusion (SHOT) scheme explain their latest annual report.

The Serious Hazards of Transfusion (SHOT) scheme has been running for 21 years now. It continues to collect and analyse anonymised information reported in the UK about serious adverse reactions and other serious adverse events (SAE) related to blood transfusion. The cumulative learning from past recommendations has led to the mitigation of many system faults that led to fatal and potentially fatal errors. Errors attributable to “human factors” persist, and so systems and practices must be re-assessed, and re-designed to persist, and so systems and practices led to fatal and potentially fatal errors. It is important, when designing new systems, to be vigilant in checking identification details of the component against those of the patient.

There were 21 deaths where transfusion was implicated, and 112 additional cases where patients suffered major morbidity. The breakdown of all reports analysed and included in the Annual SHOT Report 2017 (published in July 2018, and available at shotuk.org) is as shown in Figure 1. The number of preventable errors remains high, with 85.5% in 2017 compared with 87.0% in 2016.

Deaths and major morbidity

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“Staff should be vigilant in checking identification details of the component against those of the patient”
Twelve of 21 transfusion-related deaths reported in 2017 were due to pulmonary complications. An additional six were related to delays. Laboratory staff in particular should take note of the key SHOT message and laboratory recommendations to facilitate the rapid issue of blood components in emergency situations. Prompt initiation of “concessionary release” policies (enabling emergency issue of components that don’t meet best practice guidelines) and good communication are vital in emergencies.

**Key recommendations**

The very first SHOT report recommendation from 1997-8 states: “The bedside check is vital in preventing transfusion error. Staff should be vigilant in checking identification details of the component against those of the patient.” The recommendations from the 2017 SHOT report reflect the persistence of human factors and the roles of the correct application of knowledge, supported by effective use of IT in reducing transfusion error:

1. **Knowledge and skills:** Training in ABO and D blood group principles is essential for all laboratory and clinical staff with any responsibility for the transfusion process. This should form part of the competency assessments.

2. **Information technology:** All available information technology (IT) systems to support transfusion practice should be considered and these systems implemented to their full functionality. Electronic blood management systems should be considered in all clinical settings where transfusion takes place. This is no longer an innovative approach to safe transfusion practice, it is the standard that all should aim for.

3. **TACO:** A formal pre-transfusion risk assessment for transfusion-associated circulatory overload (TACO) should be undertaken whenever possible, as TACO is the most commonly reported cause of transfusion-related mortality and major morbidity.

Patients who develop respiratory distress during or up to 24 hours after transfusion where transfusion is suspected to be the cause must be reported to SHOT. The national comparative audit of TACO in 2017 demonstrated that risk factors are being missed.

**Key SHOT messages**

1. **Guidelines or rules?** Guidelines must not be translated into inflexible rules. Proportionate application of knowledge and experience may lead to a different course of action in individual circumstances. But the final bedside check is a rule and must be completed in full.

2. **Basic training:** It is essential that all staff participating in transfusion fully understand ABO groups so that they can recognise potential ABO-incompatibility.

3. **IT systems** have the potential to increase transfusion safety by minimising human factors and should be considered for all transfusion steps.

**Laboratory errors**

There were 740 errors reported to SHOT in 2017 that originated from the laboratory comprising 409 errors where the patient was transfused, and 331 near misses.

**ABO-incompatible transfusions**

There were four ABO-incompatible FFP transfusions due to errors at sample receipt (1), case 1, testing (1) and component selection (2) and 1 ABO-incompatible platelet transfusion due to a component selection error. Two other ABO-incompatible transfusions occurred as a result of clinical errors (red cells due to administration error and platelets due to a wrong blood in tube error).

**Improving safety**

The relative risks of transfusion today are low. In order to further improve transfusion safety, laboratory staff (and all staff involved in the transfusion process) should take heed of the key SHOT messages and recommendations. Good communication, full understanding of transfusion principles, diligent checking and re-checking, all supported by effective use of IT solutions will help to mitigate the risk of transfusion error.

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