9 Handling and Storage Errors (HSE) n=264

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Definition:

All reported episodes in which a patient was transfused with a blood component intended for the patient, but in which, during the transfusion process, the handling and storage may have rendered the component less safe for transfusion.

Key SHOT message

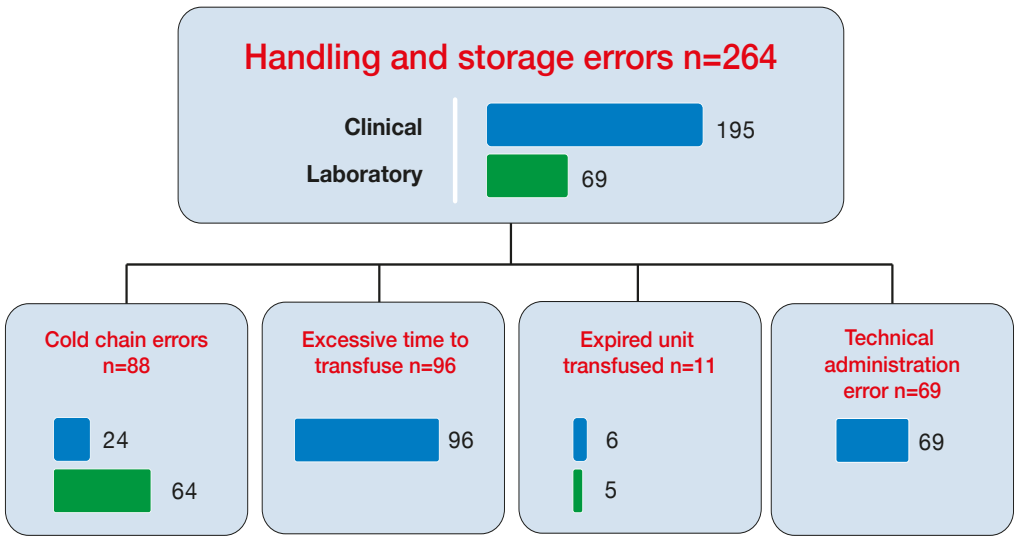
- All clinical staff need to be aware of recommended transfusion times. The British Society for Haematology (BSH) administration guidelines state 'red blood cells should be transfused in 4 hours from the time the component was removed from the refrigerator' (Robinson et al. 2017). SHOT only accept cases that have been transfused in excess of 5 hours (Foley et al. 2016)

Key SHOT messages from 2017 still remain pertinent - communication and do not assume, verify (Bolton-Maggs et al. 2018).

In 2018 264 HSE cases were reported (243 in 2017) (Bolton-Maggs et al. 2018). Clinical errors accounted for 195/264 (73.9%) and laboratory errors 69/264 (26.1%). In addition, there were 157 near miss HSE, 96/157 (61.1%) clinical, 61/157 (38.9%) laboratory.

Figure 9.1 illustrates the breakdown of HSE incidents. In most HSE categories the numbers remain similar to 2017, however reports of excessive time to transfuse (>5 hours) increased by 29.7% in 2018 from 74 (2017) to 96. Fortuitously of the 96 cases of excessive time to transfuse there were no cases of patient harm reported, nevertheless there is the potential for patient harm due to possible bacterial proliferation as a result of the time interval from removal from controlled temperature storage (CTS).

Figure 9.1: Breakdown of 2018 HSE reports n=264



The three cases below demonstrate how patient safety, verification and effective communication is critical especially when transferring patients/shared care of patients or shift handovers as they can result in excessive time to transfuse.

Case 9.1: Poor handover between two nurses overseeing the same patient leads to excessive time to transfuse

Nurse 2 received a handover from nurse 1 at 15:30 to look after a patient receiving a transfusion. When nurse 2 went to the patient, it was identified from the blood transfusion tag that the transfusion sample for the patient had expired at 14:00. Nurse 2 stopped and discontinued the transfusion at that time. On further investigation the unit had been collected from CTS at 10:15, the transfusion had been running for 5 hours 15 minutes. As the sample for the patient had expired at 14:00 and this was clearly marked on the transfusion tag, the transfusion should have been discontinued at that time or nurse 1 should have ensured that there was adequate time to infuse the unit according to local policy. On investigation nurse 1 had recognised that the transfusion should have been running at an appropriate rate and had requested assistance with this task. Furthermore, although nurse 2 stopped the transfusion, neither nurse 1 or 2 had undertaken the appropriate safe transfusion practice training. The patient did not experience any clinical reaction.

The points below indicate where in the process this error could have been prevented

- Nurse 1 raised concerns and asked for support, however did not stop the transfusion
  - There was inadequate support from other clinical staff
  - Both nurses did not have valid safe transfusion practice training appropriate to their role, leading to the nurses undertaking duties that they were not trained to perform
- Depending on local policy the transfusion could have continued, following a risk assessment as it was started before the time of sample expiry (BSH Milkins et al. 2013)

Case 9.2: Multiple staff missed opportunities to perform patient observations following transfusion

The laboratory issued four units of red cells to an acute clinical ward. The patient received two units. When the transfusion laboratory was undertaking traceability checks, it was identified that the first unit transfused had exceeded the recommended time to transfuse from removal of the component from controlled temperature storage. On further scrutiny of the transfusion form it was identified that the patient had baseline observations undertaken at 15 minutes, however no further observations were taken until the start of the second unit 6 hours and 35 minutes later. The patient was being transferred with transfusion in situ, and there was inadequate communication as to whose overall responsibility it was. Multiple staff missed carrying out checks and the unit was taken down shortly after arriving on the new ward.

Case 9.3: Poor communication during transfer of a patient between hospitals

A unit of O D-negative was removed from the emergency blood refrigerator without informing the laboratory staff. Almost two months later no documentation had been returned to the referring laboratory in relation to this unit. On investigation the unit was transfused to the patient while the patient was being transferred to another hospital. The referring hospital requested the documentation to be forwarded, however this did not happen, and a complaint was raised. The nurse who escorted the patient during the transfer recalled that the blood had been given prior to transfer but could not recall the patient details. The emergency department (ED) record stated the patient required blood but the transfusion record/ chart was transferred with the patient. It is still not known if the unit had been transfused.

There were multiple breakdowns in communication between the ED and the laboratory before the patient was transferred. The ED should have contacted the laboratory in advance of the transfer. Communications were equally challenging between the two hospitals when trying to establish the correct events and requesting transfusion documentation. This was further compounded with the delay in follow-up, making it difficult for staff to recall the exact events which led to conflicting accounts.

Of note, the National Blood Transfusion Committee (NBTC) Emergency Planning Working Group (EPWG) has recently produced a very useful document to provide revised guidance for hospital transfusion teams to prepare for, and respond to, conventional major incidents and mass casualty events. The guidance considers the transfusion emergency preparedness, resilience and response for both major incidents and large-scale disruption due to other causes and can be accessed using this link: https://www.transfusionguidelines.org/uk-transfusion-committees/national-blood-transfusion-committee/working-groups.

Learning points

- Staff should not participate in any part of the transfusion process if they are not trained and deemed competent to do so
- Staff should always remain observant during the transfusion process, including monitoring the transfusion rate to ensure that the correct rate is maintained, be vigilant with the administration checks and ensure that the correct giving set is selected for use
- Staff should stop the transfusion if the unit has exceeded the maximum transfusion time of 4 hours
- During transfers between hospitals clinical staff should contact their laboratory for advice and to ensure that the blood or components are transported and delivered correctly
- Hospitals where patients have received blood or components during transfer should ensure the return of any documentation to the patients referring hospital

Laboratory-related HSE including key messages and learning points are discussed in further detail in Chapter 14, Laboratory Errors.

Near miss HSE cases n=157

The 157 near miss HSE cases primarily involved cold chain errors 127/157 (80.9%) followed by 28/157 (17.8%) where expired units were almost transfused to patients and 2/157 (1.3%) where a technical administration error was spotted prior to transfusion.

IT-related HSE cases n=23

Further details of the IT-related reports can be found in the supplementary information on the SHOT website www.shotuk.org.

Commentary

The overall findings remain comparable with previous years. SHOT reiterates that all staff who participate in the handling and storage of blood and blood components throughout the transfusion process related to collection, testing, processing, storage, distribution and administration of components should adhere to the correct procedures that are outlined in guidelines and their local transfusion policy. Transfusion policies should be based on the most recent published guidance available (Robinson et al. 2017).

References

Bolton-Maggs PHB (Ed), Poles D et al. (2018) on behalf of the Serious Hazards of Transfusion (SHOT) Steering Group. The 2017 Annual SHOT Report. https://www.shotuk.org/shot-reports/ [accessed 30 May 2019].

BSH Milkins C, Berryman J, Cantwell C, et al. (2013) Guidelines for pre-transfusion compatibility procedures in blood transfusion laboratories: *Transfus Med* 2013;**23(1)**:3-35. http://onlinelibrary.wiley.com/doi/10.1111/j.1365-3148.2012.01199.x/full [accessed 30 May 2019].

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Foley K, Poles D, Mistry H, et al. (2016) Are the 'rules' for times in set up and duration of red cell transfusion too strict? *Transfus Med* 2016;**26(3)**:166-169 https://onlinelibrary.wiley.com/doi/epdf/10.1111/tme.12308 [accessed 31 May 2019].