Transfusion-Transmitted Infections (TTI) Case Studies

2020-2022

You are free to use these examples in your teaching material or other presentations, but please do not alter the details as the copyright to this material belongs to SHOT

Near miss bacterial transfusion-transmitted infection (TTI) (*Staphylococcus aureus*)

- *An apheresis platelet pack was returned to the Blood Service before being transfused, following the observation of clumps within the pack by the hospital transfusion laboratory*
- *On return, small white flakes could be seen in the pack. Routine bacterial screening was reported as negative*
- *BacT/ALERT bottles were also returned for further culture and investigation*
- *Samples from the pack itself were positive for Staphylococcus aureus in both anaerobic and aerobic bottles on two occasions*
- *S. aureus was also isolated from a swab from the implicated donor*
- *Molecular typing confirmed the donor and pack isolates were a single strain*
- *The donor was informed and removed from the donor panel*

Confirmed hepatitis B virus (HBV) transmission from a donor with occult HBV infection - recipient 1

- *Recipient 1 (50-60 years) had progressive kidney disease*
- *They were diagnosed with an acute asymptomatic HBV infection in early 2022, four months post transfusion*
- *HBV testing was performed following a liver function screen which revealed an increased alanine transaminase*
- *Blood transfusion was considered the most likely source of infection*
- *They had received 28 units of fresh frozen plasma over 2 months in 2021*
- *Six of the 28 donors were non-returning donors and their implicated donations all tested negative for anti-HBc and HBV deoxyribonucleic acid (DNA)*
- *Of the returning donors, 21 of 22 tested negative for anti-HBc, and one donor tested positive with HBV DNA detected in their implicated donation on retesting by individual donation nucleic acid testing (NAT)*
- *Post-donation testing had returned negative by pooled NAT*

Confirmed hepatitis B virus (HBV) transmission from a donor with occult HBV infection - recipient 2

- *Subsequent lookback investigations into red cell components made from the donation in Case 20.2 identified a second HBV infected recipient*
- *Recipient 2 (70-80 years) had severe fibrosis due to non-alcoholic fatty liver disease*
- *Nine months post transfusion, the recipient was tested and found to be positive for HBsAg, HBeAg and anti-HBc*
- *HBV deoxyribonucleic acid (DNA) was also detected at a very high level*
- *They had tested negative for HBsAg in May 2017, and no other source or risk factors for HBV were identified*
- *Following their positive test, the patient was started on antiviral treatment*
- *Sequencing analysis showed high similarity between the virus obtained from the implicated donor and the two recipients, and confirmed transfusion as the source*

Probable Hepatitis B (HBV) TTI case: (Morbidity: 0; imputability: 2 probable) (1)

- *A male in his 50s was diagnosed with an acute HBV infection following a routine dialysis screening, which included testing for HBsAg*
- *The case was initially reported to Public Health England (PHE) by the renal team following the first HBsAg positive result*
- *Retrospective testing of patient samples found HBV DNA in a December 2019 sample; samples tested prior to that were negative for HBV including anti-HBc*
- *No other source or risk factors for HBV infection were identified, but it should be noted that the patient was born in a part of the world where HBV is endemic, and hence reactivation cannot be completely excluded*
- *Staff and patient screening were performed, and no obvious source was found. The patient had not been vaccinated against HBV and did not present with any symptoms*
- *Blood transfusions from the previous 6 months were identified; these included 11 donor exposures.*
- *A total of 10 returning donors tested negative for anti-HBc, the remaining blood donor tested positive for anti-HBc*

Probable Hepatitis B (HBV) TTI case: (Morbidity: 0; imputability: 2 probable) (2)

- *They had given three previous donations, and these were found positive for anti-HBc in retrospective testing*
- *HBV DNA was detected in the implicated red cell donation at 8.6IU/mL; lookback into FFP and two HBV DNA-negative donations are still on-going*
- *All three donations were HBsAg negative on screening, and no HBV DNA was detected at the time of donation*
- *This is in keeping with an Occult Hepatitis B infection (OBI) in the donor, who was born in an HBV endemic country. The donor has been informed that they have OBI and has been referred for specialist care. They can no longer donate blood*
- *A large volume follow-up sample was obtained from this donor to allow further sequence comparison between their sample and recipient sample*
- *Unfortunately, HBV DNA was not detectable on the donor sample despite concentration (note low levels of fluctuating HBV DNA is typical in OBI)*
- *The recipient sample was identified as HBV genotype E; the common type identified in Sub-Saharan Africa and keeping with transmission*

2019 - Probable Hepatitis E (HEV) TTI case from 2019

- *This was a multi-transfused female in her 20s with aplastic anaemia and Turners syndrome*
- *She was diagnosed with HEV infection in August 2019, and although the virus has now cleared from her blood, anti-viral treatment has not been stopped yet (due to her immunosuppression)*
- *Fortunately, her alanine aminotransferase (ALT) levels have remained normal and she has not developed a hepatitis*
- *It was identified retrospectively that a red cell donation she received in June 2019 contained a small amount of HEV RNA (31IU/mL)*
- *This unit was tested correctly at the time of donation testing, but HEV RNA was not detectable with the screening assay at this level (a detection limit around 500IU/mL)*
- *Due to the small viral load, we could not do sequencing to confirm the transmission and hence the case is reported as probable*
- *It is recognised that the current HEV screening in place in England will not be able to identify donations with a very small amount of HEV RNA*