

ASK A SPECIALIST**Ask a Pathologist**
Blood Product Contamination
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Question: My patient developed a fever during a packed red blood cell transfusion. What is the likelihood that the fever is due to bacterial contamination of the blood product?

Answer: Fever is a common feature of many different types of transfusion reactions, including febrile non hemolytic transfusion reaction (FNHTR), acute and delayed hemolytic transfusion reactions, transfusion related acute lung injury (TRALI), transfusion associated graft vs host disease, and microbial contamination of the blood product. Of these types of reactions, FNHTR is the most common and is generally considered to be a benign and self-limited type of reaction. While the remaining reaction types occur much less frequently, they are much more serious and may be associated with significant morbidity and mortality¹.

Sepsis secondary to transfusion of contaminated blood products is considered a very rare event. From 1976 to 1998, the U.S. Food and Drug Administration (FDA) received reports of 26 fatalities thought to be from contaminated whole blood or red cells². The most common culprits in contaminated red blood cell units are Gram negative bacilli, which are thought to originate from transient bacteremia during blood donation in an otherwise asymptomatic blood donor. This may also

occur after dental manipulation or even tooth brushing.

Platelets have a higher rate of bacterial contamination than red blood cell units, as they are stored at room temperature with constant agitation which is conducive to microbial growth. A wide range of bacteria have been documented in platelet products, but Gram positive skin flora are seen most commonly. While Gram negative organisms are rare in platelet products, when present they are associated with increased mortality³.

Introduction of a diversion pouch during apheresis platelet collection and mandatory bacterial culture for all platelet units 24 hours after collection has resulted in a dramatic decrease in the risk of bacterial contamination of platelet units². It is now estimated that approximately 1 in 6000 platelet units are contaminated with bacteria and 1 in 100,000 platelet units will cause a septic transfusion reaction. Fatalities from bacterially contaminated platelets are estimated to occur in 1 in 500,000 platelet transfusions⁴.

In 2016, the FDA issued a draft guidance proposing additional measures to

address the residual risk of bacterial contamination. Two possible approaches were suggested: pathogen reduction (PR) technology and secondary bacterial testing (SBT) methods³. As this guidance has not been finalized at this time, many blood banks have yet to implement either of these additional strategies.

The key to diagnosing transfusion related sepsis is culturing the same organism from the patient and from the residual transfused blood product. Gram stain of the suspected blood product bag may be performed at the time of the transfusion reaction, but has a low sensitivity in this setting. Visual inspection of the unit including color changes and frothiness are important clues.

In conclusion, though rare, transfusion related sepsis can be a potential cause for fever during transfusion and consequently a cause for increased morbidity and mortality in patients.

Notes

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