

Transfusion reaction: GVHD

Transfusion-associated graft versus host disease (TA-GVHD) is a near universally fatal complication of blood product transfusions. A separate entity from GVHD associated with stem cell transplantation, TA-GVHD occurs when donor lymphocytes in a blood product are able to proliferate, recognize the recipient's cells as foreign, and destroy them. Donor lymphocytes are typically destroyed by the recipient's immune system but if the recipient is immunosuppressed, or if there is a partial HLA match, the donor lymphocytes can evade the immune system and wreak havoc on the host's HLA-expressing cells.

TA-GVHD is most typically seen in immunocompromised patients whose immune system fails to eradicate lymphocytes in the donor blood product. However, it can also be seen in the setting of a partial HLA match between donor and recipient where the recipient's immune system does not recognize the donor lymphocytes as foreign but HLA expression is different enough that the donor lymphocytes attack the recipient's cells. This is a bigger problem in populations that are more genetically homogenous and in direct donation between family members.

There is no treatment for TA-GVHD so prevention is paramount. Fortunately it is relatively easy to render lymphocytes unviable. Immunosuppressed recipients should have all their blood products irradiated. Some pathogen inactivation techniques could be used instead such as psoralen, amotosalen, and amustaline, but irradiation is more common. A freeze-thaw cycle (i.e. cryoprecipitate, FFP) is also sufficient to reduce the risk of TA-GVHD. Viable lymphocytes are present in most blood products including whole blood, packed RBCs, unfrozen plasma, and platelets so proper treatment of these is important. There is also an association between TA-GVHD and age of the blood product transfused with most cases occurring in products stored <10 days and minimal risk beyond 14 days. NB: lymphocytes are present in cryoprecipitate but given that its processing necessarily involves a freeze-thaw cycle, no cases of TA-GVHD associated with cryoprecipitate have been reported.

Symptoms are typically non-specific but are related to tissues that express class-2 HLAs. Patients can present with pancytopenia, GI distress, abnormal LFTs, and rash. Treatment is largely unsuccessful (mortality of 90-100%) and includes supportive care, stem cell transplant, and/or immunosuppression.