



Oklahoma Blood Institute
TRANSFUSION TRIBUNE

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TRANSFUSION-ASSOCIATED GRAFT VS HOST DISEASE (TA-GVHD)

Blood components are irradiated to prevent this rare but usually fatal complication of transfusion. TA-GVHD occurs when immunologically competent donor T-cells are not cleared by the recipient's immune system in immunoincompetent recipients. The donor lymphocytes proliferate and "mount an attack" on the recipient. While leukoreduction will decrease the incidence, irradiation is the "gold standard" for prevention.

TA-GVHD can be seen in immunocompetent recipients such as those receiving a blood component from a first or second degree relative. Irradiation is performed on all directed units. In this situation, the donor is most commonly HLA homozygous for an antigen that the recipient is heterozygous for, thus the recipient "sees" the donor cells as self, but the donor's lymphocytes "see" the recipient as foreign. They multiply and attack the patient's tissues. TA-GVHD has many of the same sequelae as GVHD seen in bone marrow transplantation. The symptoms usually appear within two weeks but can occur 3—40 days after the transfusion. An erythematous rash and fever are the first symptoms. The process progresses to pancytopenia. TA-GVHD is almost 100% fatal so prevention is key.

Irradiation

Cellular blood components (RBC, granulocytes, platelets) are irradiated to prevent TA-GVHD. Irradiation is accomplished by exposing the

blood products to 25 Gy of gamma irradiation, which prevents the donor lymphocytes from replicating/proliferating. Oklahoma Blood Institute uses Rad Sure Blood Irradiation Indicator labels. These labels contain radiation sensitive film that reads "Not Irradiated". Once the product is irradiated, the word "Not" disappears, showing that the product has been irradiated.

What kind of patients are at risk for TA-GVHD?

Patients with primary or acquired immune suppression of t-cells are at risk.

When is irradiation needed?

Irradiation of cellular blood components would be indicated in the following circumstances:

- Intrauterine/exchange transfusions
- All blood products given to bone marrow transplant/hematopoietic stem cell recipients (Note: actual bone marrow/stem cell products should not be irradiated)
- All directed donations from blood relatives
- All crossmatched platelets
- DiGeorges, Severe Combined Immunodeficiency Disease
- Wiskott-Aldrich disease
- Hodgkins Disease
- Patients receiving fludarabine phosphate, cladribine, Alemtuzumab or any other purine analog drugs
- All granulocyte transfusions
- All neonates weighing < 1200 g

References

Gorlan JB, Mintz PD. Transfusion Therapy: Clinical Principles and Practices, 2nd Ed. Bethesda, Maryland: AABB Press, 2005; 579-595.

Popovsky, MA, Transfusion Reactions, 3rd Edition, Bethesda, Maryland: AABB Press, 2007

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