

Risks of Blood Transfusion

Side Effects and Hazards for Whole Blood and All Blood Components

A Compendium of Transfusion Practice Guidelines; American Red Cross, 3rd Edition 2017

Immunologic Complications, Immediate

1. Hemolytic transfusion reaction (incidence: 1:12,000 to 1:38,000)
2. Immune mediated platelet destruction (incidence: 4-13%)
3. Febrile non-hemolytic reaction (incidence: 0.1-0.4%)
4. Allergic/urticarial reaction, mild (incidence: 0.1-0.6%)
5. Anaphylactic reaction (incidence: 1:20,000 to 1:50,000)
6. TRALI (transfusion related acute lung injury) (incidence: 1:12,000 to 1:148,000)

Immunologic Complications, Delayed

1. Delayed hemolytic reaction (incidence: 1:5,400 to 1:62,000)
2. Alloimmunization (incidence: 1:1,500 to 1:3,000)
3. PTP (post transfusion purpura) (incidence: less than 1:2,000,000)
4. TA-GVHD (transfusion associated graft-vs-host disease) (incidence: exceedingly rare)

Non-immunologic Complications

1. Infectious agent transmission (viruses, bacteria, parasites, vCJD, and others)
 - a. Incidence:
 - 1) CMV: 1-4% with leukoreduced components in a sero-negative donor
 - 2) Babesia: 47 transfusion transmissions from unscreened blood since 2010
 - 3) Malaria: <0.1 per 1,000,000
 - 4) Leishmania: rare case reports
 - 5) vCJD: 4 cases worldwide
 - 6) Lyme disease: no cases
 - 7) HIV: 1:1,467,000
 - 8) HCV: 1:1,149,000
 - 9) HBV: 1: 765,000-1,006,000
 - 10) HTLV I/II: 1:4,364,000
 - 11) Treponema pallidum: no cases since the 1960s
 - 12) West Nile Virus: 11 cases of transfusion transmission from screened blood
 - 13) Trypanosoma cruzi: No transmissions reported from screened blood
2. Bacterial sepsis (incidence: 1:5,000,000 for red cells, 1:107,000 for platelets)
3. TACO (transfusion associated circulatory overload); leading to pulmonary edema (incidence: 1-8%)
4. Hypothermia, leading to coagulopathy (incidence: unknown, mostly occurs in trauma or in pediatric and neonatal patients)
5. Metabolic complications (incidence: unknown, mostly occurs in trauma or in pediatric and neonatal patients)

Fatalities Reported to FDA Following Blood Transfusion

Complication	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
TRALI	47%	56%	65%	35%	30%	45%	33%	45%	37%	43%	32%	19%
Hemolytic non-ABO	26%	14%	4%	15%	18%	13%	20%	13%	13%	13%	11%	2%
Hemolytic ABO	10%	5%	6%	22%	9%	5%	10%	8%	3%	13%	5%	9%
Sepsis	13%	11%	12%	15%	11%	5%	12%	8%	13%	3%	14%	12%
TACO	2%	13%	10%	7%	27%	20%	13%	21%	34%	17%	30%	44%
Anaphylaxis	0%	2%	4%	7%	2%	10%	7%	5%	0%	7%	5%	12%
Other	3%	0%	0%	0%	2%	3%	3%	0%	0%	3%	3%	2%
Total # fatalities	62	63	52	46	44	40	30	38	38	30	32	43

<https://www.fda.gov/BiologicsBloodVaccines/SafetyAvailability/ReportaProblem/TransfusionDonationFatalities/default.htm>