

TRALI Table 3

CLINICAL AND RADIOLOGICAL FEATURES OF CASES REPORTED AS TRALI

TRALI case number	Risk factors	Symptoms/signs					
		Fever or rigors	Reduced blood pressure	Dyspnoea or tachypnoea	CVP	Reduced pO2	Chest X ray
1		N	Y	Y		Y	Unspecified changes
2	Sepsis, hypoalbuminaemia, ? cardiac failure	N	Y	Y		Y	Pulmonary oedema
3	Haemorrhagic shock	N	Y	Y	Low	Y	Not specified
4		N	Y	Y		Y	Not specified
5	On ITU, narcotics, preexisting pulmonary oedema	Y	Y			Y	Severe pulmonary oedema
6		N	N	N		Y	Bilateral alveolar opacification
7	Campath treatment, sepsis, radiation to chest	Y	N	Y		Y	Widespread shadowing
8		N	N	Y		Y	Bilateral fluffy shadows
9			N				Not specified
10	On ITU post splenectomy, haemorrhagic shock, ? sepsis	N	Y	Y		Y	Acute respiratory distress
11		Y	N	Y		Y	Wet lungs to midzone
12	On ITU post cardiac bypass, chronic obstructive airways disease	N	Y	Already on ventilator	Not raised	Y	Peripheral fluffy opacities consistent with ARDS
13	Cytotoxic therapy, sepsis	Y	Y	Y		Y	Patchy changes throughout
14	Cytotoxic therapy	Y	N	Y	Signs of heart failure	Y	Bilateral shadowing
15	Haemorrhagic shock, hypoalbuminaemia	Y	Y	Y	Low	Y	Bilateral changes
TRALI case	Risk factors	Symptoms/signs					

number		Fever or rigors	Reduced blood pressure	Dyspnoea or tachypnoea	CVP	Reduced pO2	Chest X ray
16		Y	Y	Y	Not raised	Y	Not specified
17	Haemorrhagic shock	N	Y	Y		Y	Bilateral shadowing
18	Sepsis, white cell count $91 \times 10^9/L$, cytotoxic therapy	N	N	Y		Y	Not specified
19	? sepsis	N	Y	Y		Y	Pulmonary oedema
20		N	Y	Y		Y	Bilateral alveolar air space shadowing
21	On ITU post allogeneic BMT and splenic rupture, cytotoxic chemotherapy, hypoalbuminaemia	N	Y	Y	Normal left ventricular function on ECHO cardiograph	Y	Bilateral pleural effusions then bibasal shadowing
22	Haemorrhagic shock	N	Y	Y		Y	Not specified
23	Narcotic analgesia	Y	Y	Y		Y	Pulmonary oedema
24	? sepsis	N	N	Y		Y	Ill defined opacities in right perihilar and more peripherally in left lung consistent with aspiration or infection
25	Cytotoxic therapy	Y	Y	Y	Clinical signs of heart failure	Y	Fluid overload
26	Sepsis	N	N	Y		Y	Typical for TRALI
27	Cardio-pulmonary bypass	N	Y			Y	Widespread consolidation
28	On ITU after aortic aneurysm repair	Y	Y	Already on ventilator		Y	Non-specific changes

TRALI case number	Risk factors	Symptoms/signs					
		Fever or rigors	Reduced blood pressure	Dyspnoea or tachypnoea	CVP	Reduced pO2	Chest X ray
29	Cytotoxic therapy, sepsis, hypoalbuminaemia, prolonged oxygen therapy	Already present	Y	Y	Clinical signs of heart failure	Y	Patchy bilateral shadowing
30	On ITU post cardiac bypass, chronic obstructive pulmonary disease, hypoalbuminaemia	Y	N	Y		Y	Bilateral widespread pulmonary infiltrates
31	Post allogeneic bone marrow transplant, pseudomonas chest infection, severe HSV oral ulceration,	N	Y	Y		Y	Bilateral widespread interstitial shadowing
32	Asthma	N	Y	Y	Clinical signs of heart failure	Y	Bilateral upper lobe infiltrates
33	Cytotoxic therapy, sepsis, previous cerebral infarct due to leucostasis secondary cerebral haemorrhage, probable cardiac failure	N	Y	Y	Clinical signs of heart failure	Y	Diffuse bilateral alveolar shadowing
34	Post allogeneic bone marrow transplant, hypoalbuminaemia	N	N	Y		Y	Bilateral interstitial shadowing, becoming diffuse
35	Cytotoxic therapy, sepsis	Y	N	Y		Y	Diffuse bilateral alveolar shadowing
36		N	N	Y		Y	Right lower lobe shadowing but not a new change

TRALI TABLE 1

TRALI Case number.	Age/ Sex	Diagnosis	Reason Transfused	Components Transfused in 24 hours						Interval between transfusion and symptoms	
				RBC	BC	Plt	FFP	Cryo	WB		Incriminated Components
1	77, M	Chronic lymphatic leukaemia	Bone marrow failure			1				Apheresis Platelets	2 hours post transfusion completion
2	73, M	IgA Myeloma	Plasmapheresis				4			FFP	During FFP transfusion
3	34, F	Antepartum haemorrhage	Disseminated intravascular coagulation	4		1	16	20		Cryo x 4	1 hour post transfusion completion
4	13, F	Not reported	Spinal surgery	2						RBC in optimal additive	Not reported
5	78, M	Abdominal aortic aneurysm	Elective surgical repair				3			FFP	During transfusion of third unit of FFP
6	56, M	Idiopathic thrombocytopenic purpura	Splenectomy			1				Platelet pool	Transfusion given in theatre. Respiratory problem apparent in the recovery room
7	58, F	Acute lymphoblastic leukaemia	Chemotherapy induced anaemia	2						RBC	Respiratory symptoms during transfusion of second unit
8	13, M	Chronic myeloid leukaemia	Thrombocytopenia			1				Platelet pool	Exact interval not reported; within 24 hours
9	83, M	Acute urinary retention	Not clear in report				4			FFP	Exact interval not reported; within 8 hours
10	23, M	Traumatic splenic rupture	Splenectomy Haemorrhage	1			1			FFP	15 minutes after FFP commenced
11	52, M	Gastrointestinal bleed	Haemorrhage						4	Whole Blood	Exact interval not reported; within 12 hours
12	74, F	Coronary artery disease	Coronary artery bypass graft	7			6			FFP	Within 1 hour of completion of FFP transfusion
13	2, M	Posterior fossa tumour	Chemotherapy induced thrombocytopenia	1		1				Platelet pool	Within 4 hours of completion of platelet transfusion
14	74, F	IgA Myeloma	Thrombocytopenia Epistaxis			1				Platelet pool	Exact interval not reported; within 12 hours
15	30, F	Liver disease Oesophageal varices	Variceal bleeding	3			1			FFP	Sudden onset symptoms following FFP unit. Exact interval not reported
16	45, F	Uterine abnormality	Hysterectomy	8			4			RBC/FFP	Within 6 hours of completion of transfusion

			Post operative bleed								
				Components Transfused in 24 hours							
TRALI number.	Age/ Sex	Diagnosis	Reason Transfused	RBC	BC	Plt	FFP	Cryo	WB	Incriminated Components	Interval between commencing transfusion and symptoms
17	27, F	Childbirth	Post partum anaemia						4	Whole Blood	Within 2 hours
18	63, F	Chronic myelomonocytic leukaemia in transformation	Anaemia due to marrow dysfunction	1						RBC	2 hours after completion of third red cell unit.
19	67, F	Acute Myeloid Leukaemia	Anaemia due to marrow dysfunction	1						Plasma-reduced RBC	2 hours after commencement of transfusion
20	57, F	Acute myeloid leukaemia	Thrombocytopenia			1				Platelet pool-plasma contributor to pool implicated	Exact interval not reported; within 9 hours
21	58, M	Non Hodgkins lymphoma	Splenic rupture Emergency splenectomy			2				Platelet pool	Reported as 'shortly' after completion of platelet transfusion
22	28, F	Ectopic pregnancy	Haemorrhage Abnormal clotting following large blood transfusion				2			FFP	Within 6 hours. Exact interval not reported
23	62, M	Osteoarthritis Gout	Knee surgery Post operative bleeding	1		1				Apheresis Platelets	During transfusion
24	26 days, F	Gastroschisis	Staged repair				1			Methylene blue treated FFP	Within 2 hours
25	63, F	Follicular lymphoma	Warfarin reversal				1			FFP	Exact interval not reported; within 8 hours
26	57, F	Septic arthritis	Warfarin reversal				3			FFP	"Within minutes of FFP transfusion"
27	72, M	Coronary artery disease	Coronary artery bypass surgery	6		2				Platelet pool	"coincided with transfusion of platelet pool"
28	80, M	Abdominal aortic aneurysm	Elective repair followed by prolonged coagulation	4			4	20		FFP/cryo	"towards end of FFP/cryo transfusion"
29	56, F	Acute myeloid leukaemia	Bone marrow failure. Anaemia and sepsis	2	3					Buffy coats	1-2 hours post transfusion
30	66, F	Aortic stenosis Coronary artery	Anaemia post coronary artery by	6						RBC	17 hours after completion of transfusion of 6 th RBC unit

		disease	pass graft and aortic valve surgery								
				Components Transfused in 24 hours							
TRALI number.	Age/ Sex	Diagnosis	Reason Transfused	RBC	BC	Plt	FFP	Cryo	WB	Incriminated Components	Interval between commencing transfusion and symptoms
31	40, M	Bone marrow transplant for chronic myeloid leukaemia	Thrombocytopenia Platelet transfusion pre oral surgery			3				Platelet pool	Within 2-3 hours of completion of platelet transfusion
32	77, F	Renal tumour	Radical nephrectomy Haemorrhage Prolonged APPT	2			2			FFP and RBC	"in theatre at the time of event"
33	47, F	Acute myeloid leukaemia	Coagulopathy Thrombocytopenia Cerebral haemorrhage			2	4			FFP	"during FFP/platelet transfusion"
34	19, F	Myelodysplasia Allogeneic bone marrow transplant	TTP + Plasma Exchange				13			Cryodepleted FFP	Exact interval not reported; within 4 hours
35	23, F	Acute monoblastic leukaemia Sepsis	Coagulopathy	2			4			RBC/FFP	Exact interval not reported; within 24 hours
36	49, F	Metastatic cancer	Disseminated intravascular coagulation with bleeding				4			FFP	"Acute onset with FFP"

TRALI TABLE 2

TRALI Table 2	TREATMENT				SEROLOGY			Reason given by reporter for suspecting TRALI	Likelihood of Case being TRALI
	TRALI Case number	Treatment	ITU	Ventilation	Outcome	Donors	Patient		
1	Methyl prednisolone Oxygen Diuretics Fluids	No	No	Full recovery	Donor had anti HLA A9 (A23 & A24), A2 & A68, anti HLA DR52.	HLA A24 and HLA DR52 positive	Not done	Sudden onset of symptoms, rapid resolution of hypoxia and CXR changes with steroids and oxygen. Afebrile. No history of heart failure	HIGHLY LIKELY
2	Hydrocortisone	Yes	Yes	Died	1 donor had a non specific anti HLA	Antibody negative	Not done	Reporter thought possible TRALI but patient also had sepsis and acute renal failure	POSSIBLE
3	Oxygen	Already on ITU	Yes	Full recovery	4 donors positive 3 had anti granulocyte of which 1 was anti HNA 3a 1 had anti HLA *	HNA 3a positive Cytotoxic Class 1 and II anti HLA	4 positive cross match	Acute presentation temporally related to transfusion Patient hypovolaemic	HIGHLY LIKELY
4	Not reported	Yes	Yes	Full Recovery	Negative for HLA and granulocyte antibodies	Negative for HLA and granulocyte antibodies	Not done	Not reported	UNLIKELY
5	Oxygen Diuretics Fluid Vasoconstrictors Inotropes Haemofiltration	Yes	Yes	Died	1 female donor had anti HLA Class II antibodies (anti DR4 and anti-DQ8)	Patient homozygous for HLA DR4 and positive for HLA DQ8	Not done	Sudden severe worsening of mild pulmonary oedema during FFP transfusion. Myocardial infarct excluded. CVP not raised	HIGHLY LIKELY
6	Oxygen Methyl prednisolone Fluids Diuretics Antibiotics	Yes	Yes	Full recovery	FFP donor for platelet pool female with anti HNA1a	HNA1a positive. Anti HLA Class I antibodies positive Anti granulocyte antibody negative	Negative	Respiratory problems after transfusion suggestive of TRALI. No evidence of cardiac dysfunction clinically or on ECHO	HIGHLY LIKELY
7	Methyl prednisolone Oxygen Fluids	Yes	Yes	Full recovery	2 donors 1 negative for HLA and granulocyte antibodies. 2 nd donor male	Negative for HLA and granulocyte antibodies	Not done	Reporter unsure if TRALI or other cause of ARDS	UNLIKELY

8	Oxygen	Yes	No	Full recovery	One donor anti HLA not reactive with patient leucocytes	Anti HLA and granulocyte antibodies	Donor v patient negative	Bilateral fluffy CXR shadows post transfusion	POSSIBLE
9	Oxygen Hydrocortisone	Yes	No	Full recovery	3 donors all negative for HLA and granulocyte antibodies	Not known	Not known	Reporter unsure whether TRALI or other acute reaction	UNLIKELY
10	Oxygen Hydrocortisone Piridon	Yes	Yes	Died	FFP donor had anti granulocyte antibodies. Negative for lymphocyte antibodies	Negative for anti HLA Class I and granulocyte antibodies.	Donor v patient positive	Strong temporal relationship with FFP transfusion and serological results	HIGHLY LIKELY
11	Oxygen Diuretics Piridon Steroids	Yes	CPAP	Full recovery	One female donor had HLA Class I and II antibodies including anti DR52 and DQ2	Patient positive for corresponding HLA antigens DR52 and DQ9 Negative for anti granulocyte antibodies	Not done	Sudden onset of suggestive symptoms during transfusion of 4 th unit of whole blood	HIGHLY LIKELY
12	Oxygen Diuretics	Already on ITU	Already on ventilator	Died	1 female donor had anti HLA DR4	HLA DR4 positive	Not done	Sudden development of non cardiogenic pulmonary oedema related to transfusion. Reporter sure that adverse reaction related to transfusion	HIGHLY LIKELY
13	Oxygen Diuretics Fluid	Yes	Yes	Full recovery	1 donor anti HLA Class II	Anti HLA and anti granulocyte antibody negative	Donor v patient positive	Onset within 2 hours of platelet transfusion, not fluid overload, couldn't exclude sepsis	HIGHLY LIKELY
14	Oxygen Diuretics Blood	No	No	Died	All implicated female donors negative for HLA and granulocyte antibodies. 1 untransfused male excluded.	Not done- no sample available	Not done	Not reported	UNLIKELY
15	Oxygen inotropes	Yes	Yes	Long term morbidity	FFP donor had anti HLA A2 and HLA DR52	Positive for HLA A2 and HLA DR52	Not done	Sudden onset respiratory failure after FFP. Other causes of ARDS less	HIGHLY LIKELY

								likely – No fluid overload	
16	Oxygen	Yes	CPAP	Full recovery	Not reported	Patient HLA Class I antibodies	5 donors FFP/RBC had positive crossmatch with patient lymphocytes and/or granulocytes	Fit woman 6 hours post transfusion developed reaction. No fluid overload. CVP not raised. CXR consistent with ARDS	HIGHLY LIKELY
17	Oxygen Fluids Diuretics	Yes	Yes	Full recovery	Negative for anti HLA Class I and II and granulocyte antibodies	Anti HLA negative	Not done	Not circulatory overload on CVP insertion or ECHO	POSSIBLE
18	Oxygen Steroids Diuretics	No	No	Died	Only 1 untransfused male donor in 24 hours pre reaction	Not tested	Not done	Reporter thought either pulmonary embolism, leucostasis or TRALI No post-mortem	UNLIKELY
19	Oxygen Hydrocortisone Diuretics	Yes	Yes	Died	Anti-granulocyte antibody specificity not determined	Negative for anti HLA and granulocyte antibodies	Not done	Became hypoxic and hypotensive 1-2 hours after start of red cell unit. Clear chest on admission	POSSIBLE
20	Oxygen Hydrocortisone Diuretics Fluid	Yes	Yes	Full recovery	1 female donor had anti HLA Class II antibodies Anti DR52	Patient DR52 positive Anti DR51	Not done	Reporter was sure this was TRALI, Dramatic deterioration in respiratory function post platelet transfusion	HIGHLY LIKELY
21	Methyl prednisolone Oxygen Diuretics	Already on ITU	Already on ventilator	Recovered	8 donors 2 FFP donors tested 1 donor had anti HNA1a antibodies	HNA1a positive Anti HLA and granulocyte negative	Not done	Symptoms suggestive and temporal relationship	HIGHLY LIKELY
22	Oxygen	Yes	No	Full recovery	Donor testing currently in progress	Negative for anti HLA and anti granulocyte antibody	Not done	Gross pulmonary oedema post FFP in young patient	PROBABLE
23	Oxygen Diuretics Fluids Noradrenaline Aramine	Yes	Yes	Full recovery	1 donor had anti HLA Class II antibodies specificity HLA DR53	Patient HLA DR53 positive	Not done	Very clear link with platelet transfusion. Insufficient fluid administered to give fluid overload	HIGHLY LIKELY

24	Oxygen Cardiac massage	Yes	No	Full recovery	Not done; only donor was untransfused male	Not done	Not done	Rapid ↓ in PO ₂ X ray changes	UNLIKELY
25	Oxygen Diuretics Antibiotics	No	No	Full recovery	Donor anti HLA Class 1 and II (anti HLA DR4)	Patient HLA DR4 positive	Not done	Reporter didn't initially think it was TRALI but included in differential diagnosis	HIGHLY LIKELY
26	Oxygen	Yes	CPAP	Full recovery	1 FFP donors had HLA Class I antibody (anti A2), 1 FFP donor had anti HLA Class II antibody (anti DR52)	Patient positive for corresponding HLA A2 and DR52 antigens	Not done	Rapid deterioration within minutes of receiving FFP	HIGHLY LIKELY
27	Oxygen Methyl prednisolone	Already on ITU	Already on ventilator	Full recovery	Female donor HLA Class I anti BW6 and non specific HLA Class II antibodies	Patient positive for HLA B62 and B39 both are associated with HLA BW6	Not done	Hypotension and non cardiogenic stiff lungs coincided with transfusion of second pool of platelets	HIGHLY LIKELY
28	Oxygen	Already on ITU	Already on ventilator	Full recovery	Not done Investigator found history suggestive of fluid overload	Not done	Not done	Because patient deteriorated towards end of FFP and cryoprecipitate transfusion	UNLIKELY
29	Diuretics continued Oxygen continued Antibiotics Fluids	12 hours later	Not known	Died	Anti HLA Class II (DR8) in one female donor	Patient DR8 positive. Anti HLA and granulocyte negative	Not done	Deterioration in respiratory function post transfusion	PROBABLE
30	Oxygen Diuretics Antibiotics	Already on ITU	No	Full recovery	Testing in progress	Testing in progress	Testing in progress	Appearance of CXR consistent with ARDS CVP within normal limits	UNLIKELY
31	Oxygen Diuretics Antibiotics Hydrocortisone	No	No	Full recovery	1 donor had anti-HLA Class II antibodies (anti DR52)	Patient positive for HLA DR52	Donor v patient positive	Severe breathlessness and hypoxia started within 2-3 hours of platelet transfusion, CXR	HIGHLY LIKELY

								changes and resolution within a few days	
32	Oxygen Diuretics Salbutamol Fluids	Yes	Yes	Full recovery	1 female donor had anti HLA Class I and II including anti HLA B57, another female donor had anti HLA Class I and II antibodies including anti HLA DR4	Patient positive for HLA B57 and DR4 corresponding with donor antibodies	Not done	Information not provided Clinical signs during reaction included signs of heart failure	HIGHLY LIKELY
33	Oxygen Diuretics	Yes	Yes	Full recovery	Female FFP donor anti HLA Class II (anti HLA DR52)	Patient HLA DR52 positive	Not done	Reporter felt that clinically it was difficult to distinguish from heart failure which was also present. Patient also septic	HIGHLY LIKELY
34	Oxygen Methyl prednisolone	No	No	Full recovery	1 female donor anti HLA Class II (anti HLA DR52)	Patient HLA DR52 positive	Not done	Overload unlikely – young woman, normal L V function, plasma exchange. No other obvious cause of ARDS	HIGHLY LIKELY
35	Oxygen Diuretics Hydrocortisone Piriton	No	No	Full recovery	Tests in progress	Tests in progress	Not yet done	Fit young woman. No evidence of cardiac dysfunction. Not overloaded with fluid	POSSIBLE
36	Oxygen Diuretics Hydrocortisone Piriton	No	No	Died	Tests in progress	Tests in progress	Not yet done	Acute onset with FFP.No evidence of circulatory overload. Ambulant pretransfusion	POSSIBLE