Panel Reactive Antibodies (PRAs) and Their Association with Blood Product Exposures in Pediatric Patients Undergoing Cardiac Transplantation

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Tables

Table 1: Demographic, Preoperative, and Intraoperative Variables for all patients (N=64)

	All patients
Demographic and preoperative	
Age (Years)	7.5 (2.0, 13.0)
Weight at transplantation (kg)	26.2 (12.4, 44.2)
Number of previous surgeries	3.0 (1.8, 7.0)
Sex	
Female	32 (50.0)
Male	32 (50.0)
Race	
White	29 (45.3)
African American	26 (40.6)
Hispanic	6 (9.4)
Asian	2 (3.1)
No response	1 (1.6)
Mechanical support prior to transplantation	
No	44 (68.8)
Yes	20 (31.2)
Diagnosis	
ARVD	4 (6.2)
Dilated CM	33 (51.6)
Failed SV	18 (28.1)
Restrictive CM	7 (10.9)
Other	2 (3.1)
UNOS status	
1A	43 (67.2)
1B	21 (32.8)
Intraoperative	
Donor cross clamp time (min)	209.0 (188.0, 234.5)
CPB time (min)	138.0 (117.0, 180.0)
ABO incompatible	
No	59 (92.2)
Yes	5 (7.8)
Plasmapheresis	
No	41 (64.1)
Yes	23 (35.9)

Note:

Continuous variables expressed as median (Q1,Q3);
Categorical variables expressed as n(%)

Table 2a: Demographic, Preoperative, and Intraoperative Variables by binary HLA ab status

	All patients (n=64)	HLA ab- (n=35)	HLA ab+ (n=29)	p value
Demographic and preoperative				
Age (Years)	7.5 (2.0, 13.0)	8.0 (2.5, 13.0)	6.0 (2.0, 12.0)	0.39
Weight at transplantation (kg)	26.2 (12.4, 44.2)	28.6 (13.5, 42.6)	17.6 (12.3, 44.4)	0.58
Number of previous surgeries	3.0 (1.8, 7.0)	3.0 (2.0, 7.5)	3.0 (1.0, 7.0)	0.67
Sex				
Female	32 (50.0)	18 (51.4)	14 (48.3)	0.80
Male	32 (50.0)	17 (48.6)	15 (51.7)	
Race				
White	29 (45.3)	14 (40.0)	15 (51.7)	0.29^
African American	26 (40.6)	13 (37.1)	13 (44.8)	
Hispanic	6 (9.4)	5 (14.3)	1 (3.4)	
Asian	2 (3.1)	2 (5.7)	0 (0.0)	
No response	1 (1.6)	1 (2.9)	0 (0.0)	
Mechanical support prior to transplantation				
No	44 (68.8)	24 (68.6)	20 (69.0)	0.97
Yes	20 (31.2)	11 (31.4)	9 (31.0)	
Diagnosis				
ARVD	4 (6.2)	1 (2.9)	3 (10.3)	0.20^
Dilated CM	33 (51.6)	16 (45.7)	17 (58.6)	
Failed SV	18 (28.1)	10 (28.6)	8 (27.6)	
Restrictive CM	7 (10.9)	6 (17.1)	1 (3.4)	
Other	2 (3.1)	2 (5.7)	0 (0.0)	
UNOS status				
1A	43 (67.2)	23 (65.7)	20 (69.0)	0.78
1B	21 (32.8)	12 (34.3)	9 (31.0)	
Intraoperative				
Donor cross clamp time (min)	209.0 (188.0, 234.5)	209.0 (195.0, 231.0)	210.0 (188.0, 236.0)	0.84
CPB time (min)	138.0 (117.0, 180.0)	137.0 (123.0, 180.0)	143.0 (111.0, 175.0)	0.61
ABO incompatible				
No	59 (92.2)	32 (91.4)	27 (93.1)	0.99^
Yes	5 (7.8)	3 (8.6)	2 (6.9)	
Plasmapheresis				
No	41 (64.1)	31 (88.6)	10 (34.5)	<0.01
Yes	23 (35.9)	4 (11.4)	19 (65.5)	

Note:
Continuous variables expressed as median (Q1,Q3), Wilcoxon rank sum test; Categorical variables expressed as n(%), Chi square test or Fisher's exact test^

Table 2b: Pre, Intra, and Postoperative variables by continuous HLA ab

	HLA ab	p value
Demographic and preoperative		
Age (Years)	-0.04	0.75
Weight at transplantation (kg)	0.00	0.99
Number of previous surgeries	0.09	0.51
Sex		
Female	0.0 (0.0, 11.0)	0.83
Male	0.0 (0.0, 19.6)	
Mechanical support prior to transplantation		
No	0.0 (0.0, 13.2)	0.68
Yes	0.0 (0.0, 9.7)	
Intraoperative		
Donor cross clamp time (min)	0.10	0.42
CPB time (min)	0.08	0.51
ABO incompatible		
No	0.0 (0.0, 17.3)	0.59
Yes	0.0 (0.0, 6.7)	
Plasmapheresis		
No	0.0 (0.0, 0.0)	<0.01
Yes	26.1 (6.7, 47.2)	

Note:

Continuous variables expressed as Spearman rank correlation r; Categorical variables expressed as median (Q1,Q3), Wilcoxon rank sum test

Table 3a: Blood products and binary HLA ab status

	All patients (n=64)	HLA ab- (n=35)	HLA ab+ (n=29)	p value
Blood products - continuous median(Q1,Q3)				
Total prior donor exposures	9.0 (1.0, 23.2)	5.0 (0.0, 20.5)	10.0 (2.0, 25.0)	0.08
Red blood cells	3.0 (0.8, 9.2)	3.0 (0.0, 8.5)	4.0 (2.0, 9.0)	0.15
Platelets	1.0 (0.0, 3.0)	0.0 (0.0, 3.0)	1.0 (0.0, 3.0)	0.30
Fresh frozen plasma	1.0 (0.0, 4.0)	1.0 (0.0, 3.5)	2.0 (0.0, 4.0)	0.48
Cryoprecipitate	1.5 (0.0, 5.2)	0.0 (0.0, 5.0)	3.0 (0.0, 6.0)	0.24
Blood products - binary n (%)				
Total prior donor exposures				
No	15 (23.4)	13 (37.1)	2 (6.9)	<0.01
Yes	49 (76.6)	22 (62.9)	27 (93.1)	
Red blood cells				
No	16 (25.0)	13 (37.1)	3 (10.3)	0.01
Yes	48 (75.0)	22 (62.9)	26 (89.7)	
Platelets				
No	29 (45.3)	18 (51.4)	11 (37.9)	0.28
Yes	35 (54.7)	17 (48.6)	18 (62.1)	
Fresh frozen plasma				
No	29 (45.3)	17 (48.6)	12 (41.4)	0.57
Yes	35 (54.7)	18 (51.4)	17 (58.6)	
Cryoprecipitate				
No	30 (46.9)	18 (51.4)	12 (41.4)	0.42
Yes	34 (53.1)	17 (48.6)	17 (58.6)	

Note:

Continuous blood products: Wilcoxon rank sum test; Binary blood products: Chi square test or Fisher's exact test^

Table 3b: Blood products and continuous HLA ab

	HLA ab	p value
Blood products - continuous: correlation r		
Total prior donor exposures	0.27	0.03
Red blood cells	0.23	0.07
Platelets	0.20	0.12
Fresh frozen plasma	0.14	0.28
Cryoprecipitate	0.23	0.07
Blood products - binary: median (Q1,Q3)		
Total prior donor exposures		
No	0.0 (0.0, 0.0)	0.01
Yes	0.6 (0.0, 19.8)	
No	0.0 (0.0, 0.0)	0.03
Yes	0.5 (0.0, 21.1)	
Platelets		
No	0.0 (0.0, 4.4)	0.10
Yes	0.3 (0.0, 33.9)	
Fresh frozen plasma		
No	0.0 (0.0, 11.0)	0.43
Yes	0.0 (0.0, 18.5)	
Cryoprecipitate		
No	0.0 (0.0, 6.7)	0.18
Yes	0.1 (0.0, 37.5)	

Note:

Continuous blood product variables expressed as Spearman rank correlation r; Binary blood product variables expressed as median (Q1,Q3), Wilcoxon rank sum test

Table 4: Postoperative Variables by binary HLA ab status

	All patients (n=64)	HLA ab- (n=35)	HLA ab+ (n=29)	p value
Length of ICU stay (days)	7.0 (4.0, 10.0)	6.0 (4.0, 8.0)	7.0 (5.0, 12.0)	0.08
Vasoactive inotrope score	10.0 (8.0, 13.0)	10.0 (8.5, 12.0)	10.0 (8.0, 14.0)	0.47
Time to extubation (hrs)	17.5 (10.8, 39.0)	17.0 (9.0, 28.0)	24.0 (11.0, 86.0)	0.05
Rejection				
No	55 (85.9)	32 (91.4)	23 (79.3)	0.28^
Yes	9 (14.1)	3 (8.6)	6 (20.7)	
Donor specific antibody				
No	31 (48.4)	21 (60.0)	10 (34.5)	0.04
Yes	33 (51.6)	14 (40.0)	19 (65.5)	
ECMO				
No	60 (93.8)	34 (97.1)	26 (89.7)	0.32^
Yes	4 (6.2)	1 (2.9)	3 (10.3)	

Note:
Continuous variables expressed as median (Q1,Q3), Wilcoxon rank sum test; Categorical variables expressed as n(%), Chi square test or Fisher's exact test^
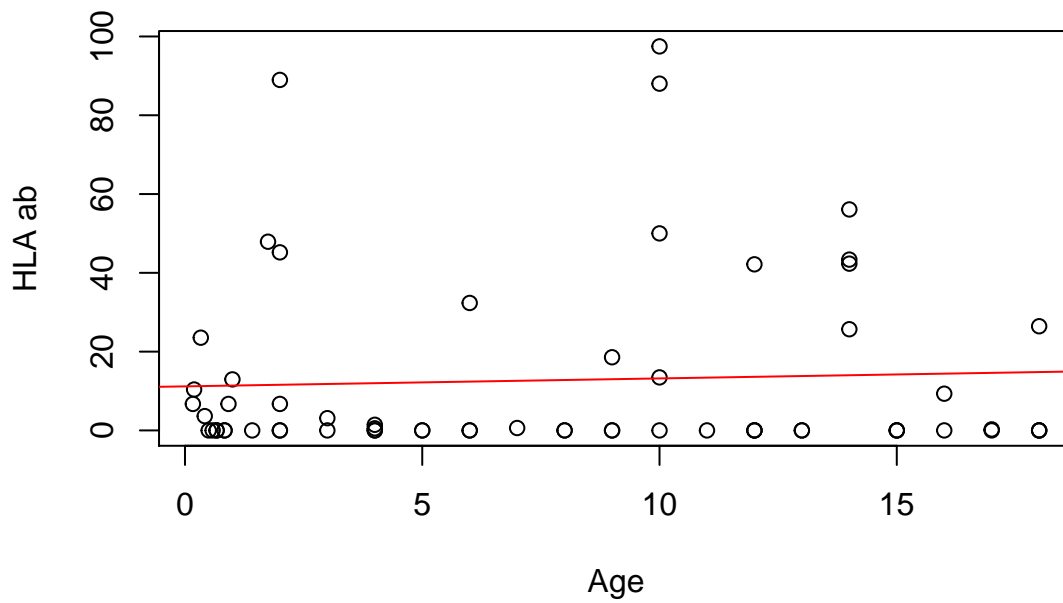
Table 5: Allele class and donor specific antibody

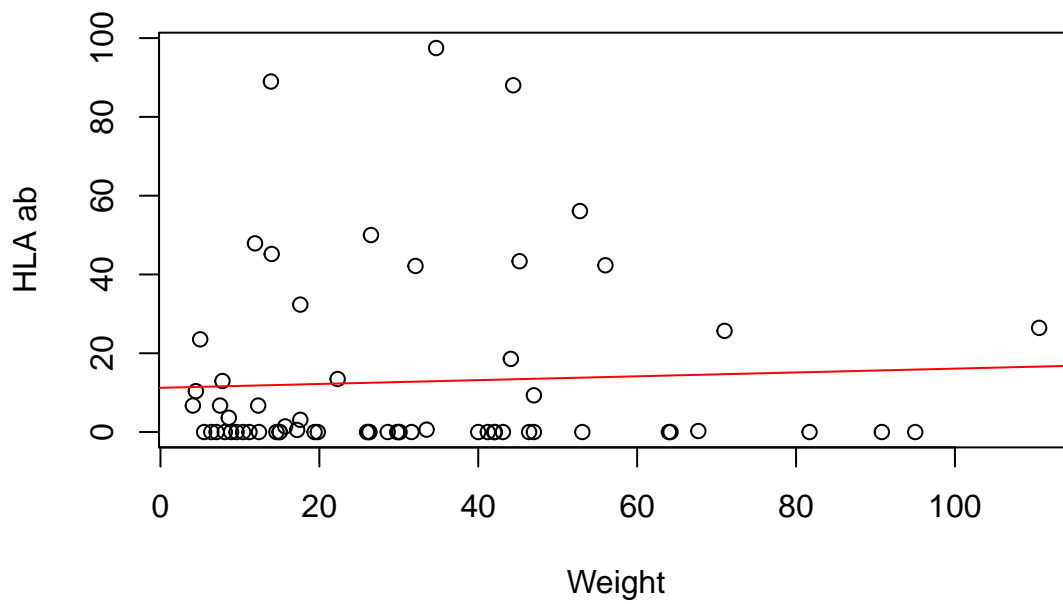|	No donor specific antibody	Donor specific antibody	Total
Class I	10 (100.0)	8 (42.1)	18
Class II	0 (0.0)	7 (36.8)	7
Class I and II	0 (0.0)	4 (21.1)	4
Total	10	19	29

Note:
p = 0.01 (Fisher's Exact)

Relationship between age and continuous HLA ab (r=−0.04)

Relationship between weight and continuous HLA ab (r=−.002)

Relationship between total blood product exposures
and continuous HLA ab (r=0.27)