49th Annual Conference of ISBTI
TRANSCON 2024
Educate, Excel, Elevate, Empower
21st - 23rd November, 2024
Ahmedabad

APPROACH TO IDENTIFICATION OF ANTIBODIES TO HIGH FREQUENCY ANTIGENS (HFA)

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BACKGROUND AND OBJECTIVES

Patients with antibodies against HFA (prevalence >90%) poses a challenge to the transfusion medicine specialists. Finding a corresponding antigen-negative compatible unit in such scenario becomes very difficult, particularly in emergency and resource-limited settings.

RESULTS

1. Anti Yt^a and c : 29 year/F, G3A1P1 at 38 weeks POG was planned for elective CS.IAT showed pan-agglutination (2+ to 3+) and papain treatment showed enhanced reaction in most of the cells(suggestive of anti-c) and diminished in 2 cells(suggestive of additional antibody). DTT treatment of red cells showed no change in reaction strength. Consecutive three adsorptions with O positive, c, E and Kell negative donor red cells was performed. Elution from the adsorbed cells showed pan-reactivity with panel cells[2+ to 3+]. Post-adsorbed sera tested against 11 panel cells confirmed the presence of anti-'c' in the sera. Reference lab found patient's cells to be Yt(a-) and confirmed presence of anti-Yt^a and anti-c in the patient's plasma. Patient delivered without any transfusion support.

i. 3-cell ii. Antibody identification by 11-cell iii. 11-cell of adsorbed sera iv. Elution of adsorbed cells

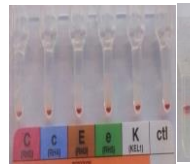
2. Anti In(b): An unbooked primigravida showed pan-agglutination with identification cells. Enzyme treatment of red cells[ID Papain Biorad] and use of reducing agent[DTT] negated reactions in all the panel cells. Blood bank had inventory of rare In(a) antisera which was thawed and tested against patient's red cells which was positive for In(a) antigen. Patient red cells were submitted to higher reference laboratory which gave negative reaction on testing with In(b) antisera. This confirmed the presence of anti-In^b in the patient's sera. Patient delivered in emergency without any transfusion.

i. 3-cell ii. Antibody identification by 11-cell iii. 11-cell after DTT treatment of serum

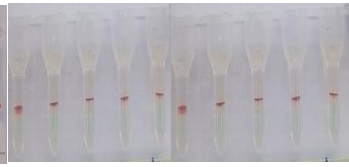
METHODS

We conducted a four years retrospective study to look at the cases wherein the plasma of patient showed pan-agglutination reaction with auto-control negativity. Evaluation(adsorption and elution studies, select cells) was done to segregate antibodies to HFA from multiple alloantibodies. Sample was further tested by enzyme and DTT to identify the specificity of HFA.

3. Anti Rh17 -: 24 year/F, 26 weeks POG with bad obstetric history(G6P4L0A1) and severe anemia. Her routine pre-operative investigations revealed group as B Rh[D] positive and antibody identification showed pan-reactivity[4+] with negative auto-control. Cross-match with B and O red cells showed 4+ incompatibility. Her Rh profile showed presence of D and absence of C,c,E,e antigens. Strength of IAT didn't reduce with DTT and papain. Molecular analysis revealed formation of RHCE-D(2-9)-CE hybrids which was responsible for D- -(Rh17) phenotype. Patient's hemoglobin was built up using Eythropoietin and intravenous iron and she managed to deliver without transfusion support.



i. Rh-Kell profile of patient



ii. Crossmatch with B+ve and Oneg bags

		D	C	E	c	e	Cw	K	k	Kpa	Kpb	Jsa	Jab	Fya	Fyb	Jka	Jkb	Lea	Leb	P1	M	N	S	s	Lua	Lub	Xg	CASE 1			CASE 2		CASE 3	
																												LISS	Adsorbed sera	Eluate	LISS	DTT	LISS	Papain
1	R1 w R1	+	+	0	0	+	+	0	+	0	+	nt	nt	+	0	0	+	0	+	+	+	0	+	+	0	+	+	2+	Neg	2	2+	Neg	4+	4+
2	R1 R1	+	+	0	0	+	0	+	+	0	+	nt	nt	0	+	+	+	0	+	+	+	0	+	0	0	+	0	2+	Neg	2+	2+	Neg	4+	4+
3	R2 R2	+	0	+	+	0	0	0	+	0	+	nt	nt	+	+	+	0	0	+	+	0	+	0	+	0	+	+	2+	2+	2+	2+	Neg	4+	4+
4	r'r	0	+	0	+	+	0	0	+	0	+	nt	nt	0	+	0	+	+	0	+	0	+	0	+	0	+	0	2+	2+	2+	2+	Neg	4+	4+
5	r"r	0	0	+	+	+	0	0	+	0	+	nt	nt	+	0	+	0	+	0	0	+	+	0	+	0	+	+	2+	2+	2+	2+	Neg	4+	4+
6	rr	0	0	0	+	+	0	+	+	0	+	nt	nt	+	+	0	+	0	0	0	0	+	0	+	0	+	0	2+	2+	2+	2+	Neg	4+	4+
7	rr	0	0	0	+	+	0	0	+	0	+	nt	nt	0	+	+	0	+	0	0	+	0	+	0	0	+	+	2+	2+	2+	2+	Neg	4+	4+
8	R0 r	+	0	0	+	+	0	0	+	0	+	nt	nt	0	0	+	+	+	0	+	0	+	0	+	0	+	+	2+	2+	2+	2+	Neg	4+	4+
9	rr	0	0	0	+	+	0	0	+	0	+	nt	nt	+	+	+	0	0	+	+	+	0	+	0	+	+	0	2+	2+	2+	2+	Neg	4+	4+
10	rr	0	0	0	+	+	0	0	+	+	+	nt	nt	+	0	0	+	0	+	+	0	+	0	+	0	+	+	2+	2+	2+	2+	Neg	4+	4+
11	rr	0	0	0	+	+	0	0	+	0	+	nt	nt	0	+	+	0	0	0	+	0	+	0	+	0	+	+	2+	2+	2+	2+	Neg	4+	4+
	A/C																											Neg			Neg			

CONCLUSION

This study highlights the stepwise approach to identify antibodies to HFA and underlines the significance of national rare blood donor registry along with frozen red cell inventory.