Reusing Immunoadsorption Column – Making the ABO Incompatible Renal Transplant Affordable

Sir,

A 47-year-old male, known case of chronic kidney disease Stage 5, type 2 diabetes mellitus and hypertension on maintenance hemodialysis for 1 year presented for renal transplant. He had been treated for hepatitis C infection and was in remission. The prospective donor was his wife. Patient's blood group was O positive, whereas his donor's blood group was A positive. There was neither a suitable blood group compatible donor available nor was there a suitable pair available for paired kidney exchange transplantation. Hence, he decided to go ahead with ABO-incompatible renal transplantation. All the necessary pretransplant workup was done. The baseline anti-A isoagglutinin titer was 1:512. Complement dependent cytotoxicity and flow cytometry crossmatch was negative. As per the center protocol for ABO-incompatible renal transplant, he received injection rituximab 200 mg intravenous (IV) about 2 weeks before the tentative date of transplant. He was admitted after 1 week of rituximab administration for cascade plasmapheresis (CP). Tacrolimus was started at 0.05 mg/kg in two divided doses (target trough level of 8–12 ng/ml) while mycophenolate sodium was started at 720 mg bd. He received alternate days of dialysis and CP sessions. Each session of CP was followed by administration of IVIG (100 mg/kg). Immediate pre- and post-CP antibody titers were monitored. Figure 1 shows the drop in isoagglutinin titer after successive CP sessions. After five CP sessions, the titer reduced to 1:32 but remained at this level despite the next two sessions. At this juncture, immunoadsorption (IA) was started after discussing the cost issue with the patient.

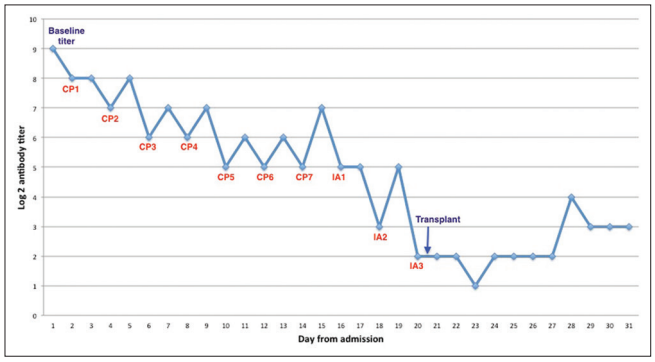

Figure 1: Titer decline after successive cascade plasmapheresis sessions. Despite cascade plasmapheresis sessions 5th–7th, the titer continued to be 32. Hence, immunoadsorption was started. After three sessions of immunoadsorption, titer successfully reduced to pretransplant target. Posttransplant maximum rebound was seen up to titer 16, which declined on its own

The glycosorb ABO column (glycorex transplantation AB) is a bio-specific affinity column containing synthetic terminal trisaccharide A or B blood group antigen covalently bound to a sepharose matrix. It removes the blood group-specific antibodies from the recipient by adsorbing the antibodies and therefore called IA. The column is European Council certified as a medical device. The glycosorb-A column was used for our patient since his blood group was O and the donor's group was A.

The IA was performed in blood bank with centrifugation technique. After the first IA session, the titer reduced from 128 to 32. As further immunoadsorption sessions were required and there were financial constraints the column was subsequently reused twice over the next 4 days (total of three procedures). For reuse, it was processed by rinsing with 1000 ml saline and sterilizing with EtO. A mobile drip stand was used to hang 1 L saline bottle; the IV set was used to connect the IA column and saline was allowed to run through it by the force of gravity and then discarded from the other end of the column. The procedure was done with aseptic precautions and took approximately 30 min. The column was stored in the dark at 2°C–8°C before and after sterilization. Average of 2.96 volume of plasma was processed per IA session. After three IA sessions, the titer reduced to 1:4 [Table 1]. The next day renal transplant was done. Immediate good diuresis and graft function was attained posttransplant and serum creatinine reduced to 1.1 on the postoperative day 4. Daily isoagglutinin titer was monitored. Posttransplant antibody titer rebound was seen up to 1:16. This later reduced to 4 on its own without requiring any further IA sessions [Figure 1]. At 6 months follow-up, the patient is doing well with good graft function (serum creatinine of 1.3).

ABO incompatible renal transplantation has evolved over the past few decades. The advent of various extracorporeal methods of anti-blood group antibody removal and improving preconditioning regimen has helped to achieve good graft and patient outcomes in short- and long-term.[1-3] TPE has been used in Japanese and American protocols. CP has been used lately in view of benefits such as lesser replacement fluid requirement, and lower infection rates.[4] IA is the most specific of these methods and selectively removes only anti-blood group antibodies. It has been used as a part of preconditioning extensively in the European protocols.[3] Although IA has many benefits, the IA column is expensive and the cost of transplant increases considerably if the column is used only once. This is even more important in Indian

Table 1: Cascade plamsapheresis and immunoadsorption session details

Serial number	Preprocedure titer (IgG)	Duration (h)	Postprocedure titer (IgG)	Plasma volume processed	Mean
CP					
1	512	3	256	1.4	2.1±0.45
2	256	4	128	1.9	
3	256	4	64	1.9	
4	128	5	64	2.1	
5	128	5	32	2.8	
6	64	5	32	2.2	
7	64	5	32	2.5	
IA					
1	128	4	32	3.8	2.9±0.91
First reuse	32	4	8	2.0	
Second reuse	32	4	4	3.1	

CP: Cascade plasmapheresis, IA: Immunoadsorption

scenario where the patient has to bear the transplant cost. Schiesser *et al*. published their experience with the reuse of the IA column and concluded that it was efficient and safe. The column was eluted with citrate solution after the procedure. This was subsequently neutralized with a buffer and filled with Immunosorba Preservation Solution containing polyhexamethylenebiguanide. Using this protocol of column reuse they could save approximately 17,000 Euros per transplant.[5] This letter intends to share our experience of even simplified and cheaper method of IA reuse whereby the objective was achieved by only saline flush and EtO preservation. The reuse sessions were tolerated well, and the titers could be reduced successfully to the desired pretransplant target level, which could not be achieved by CP. This also reduced the transplant cost considerably.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Access this article online

Quick Response Code:

Website: www.indianjnephrol.org

DOI: 10.4103/0971-4065.202832

How to cite this article: Jha PK, Tiwari AK, Sethi SK, Kher V. Reusing immunoadsorption column – Making the ABO incompatible renal transplant affordable. Indian J Nephrol 2017;27:241-2.