

# Immune Haemolysis after Renal Transplantation Secondary to ABO Minor-Mismatch between Donor and Recipient

Jayarane S, Prathiba Ramesh, Vasanthi Nadesan

## ABSTRACT

Immune haemolysis following renal transplantation has been reported and known causes include infection, medication and metabolic disturbances<sup>(1,2)</sup>. Autoimmune haemolysis after renal transplantation secondary to ABO minor mismatch is an uncommon but important cause that should be considered in the differential diagnosis of post-transplantation haemolysis. A case of haemolytic anaemia caused by graft versus host antibody formation is presented. We suggest that direct Coomb's test should be done as a routine in all cases of ABO mismatch renal transplantation and red cells compatible with both donor and recipient or group "O" packed cells should be transfused if transfusion is indicated.

**Keywords:** Renal transplantation, ABO mismatch, autoimmune haemolysis

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## CASE REPORT

A 48-year-old male with end stage renal disease secondary to chronic glomerulonephritis was transplanted with one antigen matched kidney from his living spouse. A minor ABO mismatch existed. The donor was O Rhesus D positive and the recipient was B Rhesus D positive. There was no previous history of transfusion. He was a known hypertensive for the past 10 years and had been on dialysis for the last one year.

Preoperative investigation for red cell alloantibodies was negative. Infectious markers for hepatitis, syphilis and HIV were negative. Haemoglobin was 114.2 g/l (130-180), serum proteins and bilirubin levels were normal but liver enzymes were about two times that of normal. The serum creatinine level was 770 micromol/L (80-133). The immediate postoperative period was uneventful. He received a triple drug immunosuppression of Azothiaprime, prednisolone and Cyclosporine. He was also on Felodipine, Isoniazid, Famotidine and Pyridoxine.

On the 10<sup>th</sup> post transplant day a renal biopsy was performed due to an increasing trend in the creatinine

level. It revealed acute cellular rejection. The patient was given intravenous methylprednisolone for two days and discharged on the 12<sup>th</sup> post transplant day. On the 20<sup>th</sup> day, he was readmitted for pallor and jaundice. Haemoglobin was 47.8 g/L, reticulocyte 10% (0.2-2), total bilirubin 103 micromols/L (3-70) and peripheral blood showed moderate polychromasia, slight anisocytosis and slight macrocytosis. Ultrasound of the abdomen revealed bilateral small echogenic kidneys consistent with chronic renal failure. The transplanted kidney showed no parenchymal changes and doppler revealed normal resistance index.

On request, three units of B positive blood were crossmatched, found to be compatible and transfused. The haemoglobin level after packed cell transfusion increased to 78.5 g/L.

Two days later, further blood for transfusion was requested. At this stage, all the units of group B blood crossmatched with the patient's serum were incompatible at the antihuman globulin phase. Two units of group O compatible blood were transfused. Haemoglobin estimation on the 24<sup>th</sup> day was 10 g/L and remained thereabout till the end.

During his stay in hospital, the patient developed pneumonia with disseminated intravascular coagulation, requiring ventilation. Blood cultures were negative. Broncho alveolar lavage culture grew Methicillin resistant Staphylococcus. He succumbed to his illness on Day 57 post transplant in spite of active treatment.

## SEROLOGY

Group and screen by gel card (Diamed) performed three days prior to the transplant, showed the patient to be of group B Rhesus D positive with a negative antibody screen. On the 21<sup>st</sup> day post transplant three units of group B Rhesus D positive blood were crossmatched, found to be compatible and transfused. The crossmatch was done manually by the tube technique at room temperature, 37 degrees in saline and with indirect antihuman globulin (IAHG) test after incubation for 15 minutes. However, the direct antihuman globulin test (DAHG) was found to be positive when tested retrospectively by the gel card.

Department of  
Pathology  
Faculty of Medicine  
University Malaya  
Kuala Lumpur  
Malaysia

Jayarane S,  
MBBS, MPath  
Lecturer

Unit of Transfusion  
Medicine  
University Malaya  
Medical Centre  
Kuala Lumpur  
Malaysia

Prathiba Ramesh,  
MBBS  
Medical Officer

Vasanthi Nadesan,  
MBBS, DFM  
Medical Officer

**Correspondence to:**  
Dr Jayarane S  
Tel: (603) 7950 2589  
(603) 2284 1692  
Email: jayarane@  
ummc.edu.my

Investigations for a possible cause of haemolysis were carried out after the transfusion of the three units of Group B blood using a post transfusion sample.

Direct antiglobulin test was positive (1+), with anti IgG (1+) and negative with anti-C3d antisera. Elution of adsorbed red cell antibody was carried out by the Lui Freeze-Thaw method<sup>(3)</sup>. The eluate was tested against A cells, B cells and O cells. The test was (1+) positive with B cells and negative against the others. Patient's serum was crossmatched against four different units of group B cells and was found to be incompatible at the AHG phase.

Antibody screen was negative using selectogen cells S1, S2 by Orthodiagnosics.

A repeat DCT done on the 37<sup>th</sup> post transplant day was negative.

## DISCUSSION

Several cases of immune haemolytic anaemia secondary to an ABO minor-mismatch have occurred after transplantation of bone marrow and solid organs<sup>(4,5)</sup>. The antibodies formed against the ABH system are attributed to the production of red blood cell antibodies by primed donor B lymphocytes carried along with the donor organ. This condition is a form of graft versus host disease. The immune haemolysis is self limiting and often mild but can be severe enough to require transfusion and even plasma exchange<sup>(6)</sup>.

In our patient, the diagnosis was indicated by the positive direct antihuman globulin test, the presence of anti-B antibody, polychromasia in the blood film and the raised reticulocyte count.

Several investigators have suggested that the transplant associated haemolytic anaemia may be more frequently encountered when Cyclosporine A (CyA) is used as an immunosuppressive agent. It seems CyA permits antibody formation because it selectively affects T-cell function and spares B-cell activities. In contrast, patients who received irradiated kidneys with other immunosuppressive therapy did not form "autoantibodies"<sup>(7)</sup>.

If an ABO-incompatible transplantation is performed, the patient should be observed for signs of haemolysis. If transfusion is required, blood of donor type should be transfused. In protracted haemolysis, if cyclosporine is one of the immunosuppressives used, discontinuation of the drug may be required. If haemolysis is severe, a course of plasmaexchange could be given.

## REFERENCES

1. Ruud GL de Sevaux, Bob A van Dijk, Jack FM Wetzels and Robert AP Koene. Haemolysis after kidney transplantation: beware of the graft. *Nephrol Dial Transplant* 1998; 13:512-4.
2. Nyberg G, Sandberg L, Rydberg L, et al. ABO-Autoimmune hemolytic anemia in a renal transplant patient treated with cyclosporine. *Transplantation* 1984; 37:529-30.
3. American Association of Blood Banks. Technical Manual, 13th ed; pp:692.
4. Sniecinski IJ, Oien L, Petz LD, Blume KG. Immunohematologic consequences of major ABO-mismatched bone marrow transplantation. *Transplantation* 1988; 45:530-4.
5. Ramsey G. Red cell antibodies arising from solid organ transplants. *Transfusion* 1991; 31:76-86.
6. Lundgren G, Asaba H, Bergstrom J, et al. Fulminating anti A autoimmune hemolysis with anuria in a renal transplant recipient: a therapeutic role of plasma exchange. *Clin Nephrol* 1981; 16:211-4.
7. Mangal AK, Growe GH, Sinclair M, et al. Acquired hemolytic anaemia due to auto anti A or auto anti B induced by group O homograft in renal transplant recipients. *Transfusion* 1984; 24:201-5.