ABO 부적합 신이식 후 발생한 용혈 1례

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= Abstract=

A Case of Hemolysis after Minor ABO Mismatched Kidney Transplantation

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A 9-year-old boy of B blood group with end-stage renal disease due to IgA nephropathy received group O kidney transplantation from his father. On day 9, he developed intravascular hemolysis, and anti-B autoantibody formation was confirmed. We diagnosed as immune hemolytic anemia due to passenger lymphocyte from donor, and cyclosporine withdrawl was done. Anemia resolved spontaneously, but on day 18, graft dysfunction developed, and graft biopsy revealed acute allograft rejection. Although hemolysis due to autoantibody is very rare and often mild, and the role of hemoglobinuria on acute rejection in this case is not certain, we recommend consideration of aggressive management on severe hemolysis after minor mismatched kidney transplantation. **(J Korean Soc Pediatr Nephrol 2002 ; 6 : 120-2)**

Key Words : Hemolysis. ABO mismatched kidney transplatation. Autoantibody

Introduction

Hemolysis may occur after kidney transplantation. The causes of hemolysis at kidney transplantation are medication, microangiopathy, and infection, etc1). Graft-versus-host antibody formation occurs rarely, but must be considered in monor ABO mismatched transplantation2-5). We experienced immune hemolytic anemia following transplantation of group O kidney to group B recipient, and concluded that anti-B antibody production by donor "passenger" lymphocyte was the cause.

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Case

A 9-year-old boy with end-stage-renal disease due to IgA nephropathy was admitted for his first renal transplant from his father. He had been on peritoneal dialysis for 16 months and had not received blood transfusion before transplantation. He was grouped as B Rh(D) positive, and his father as O Rh(D) positive. Post-operative course was uneventful, and the graft kidney function was good. His medication consisted of cyclosporin 100 mg-75 mg/day, azathioprine 75 mg/day, prednisone 20-15 mg/day.

On day 9, mild abdominal pain and coke-colored urine developed. Hemoglobin concentration dropped from 13.8 g/dL to 8.0 g/dL, total bilirubin concentration rised to 3.7 mg/dL. Serum creatinine level rised from 0.6 mg/dL to 1.4 mg/dL. Haptoglobin was 38 mg/dL, plasma hemoglobin was 116.1 mg/dL. There was no evidence of microangiopathy or infection. Direct Coombs' test was positive, and anti-B antibody was found to be present, and he received 2 units of crossmatch compatible group O blood. Hemolytic anemia was suspected, and cyclosporin and azathioprine was stopped. Plasmapheresis was considered but was not done because clinical and laboratory evidence of ongoing hemolysis was abscent ever since, and creatinine level was decreased to 1.0 mg/dL spontaneously.

On day 18, creatinine level had risen upto 1.6 mg/dL and proteinuria of 2200 mg/day developed. Hemoglobin level was 8.3 g/dL, and features of hemolysis were abscent. Direct Cooms' test was negative. Graft bilopsy was done on day 19, and it revealed tubular necrosis with features of tubulitis. 3-day intravenous infusion of 500mg methylprednisolone was done and creatinine dropped to 0.8 mg/dL. On day 34, he was discharged and remained well until now, 16 months after transplantation.

Discussion

The production of "autoantibody" following organ transplantation from group O donors by "passenger" lymphocyte has been reported. Ramsey analysed 106 cases, mostly involving recipient of kidney or liver[6]. ABO-antibodies, mainly of IgG class, appeared within a few days after transplantation. Hemolysis developed in about half of these patients, at a median of 10 days after transplantation. The antibodies generally disappeared within 2 months but sometimes were present much longer. In this case, hemolysis first appeared as gross hematuria on day 9, and his RBC crossmatch was incompatible with all group B donors. Direct antiglobulin test(DAT) was converted to positive which was negative before transplantation, and antibody elution test detected anti-B antibodies. Anti B isoagglutinin titer was 1:16 on day 15, decreased to 1:1 on day 30. Immunoglbulin allotyping was not done, but laboratory findings revealed that "autoantibody" was formed just after transplantation, so we concluded that it was from donor's "passenger" lymphocytes.

As cyclosporin is known to affect T-cell function selectively and spare B-cell activities, antibody formation and hemolysis had been attributed to cyclosporin[3,7], but Ramsey found no difference in the incidence of antibody formation between groups of patients treated with azathioprine or cyclosporine[6]. But cyclosporin is also known to cause microangiopathic hemolytic anemia[8], so we stopped cyclosporin at detection of hematuria.

Graft biopsy was done on day 19, because of

secondary creatinine rise, and acute rejection was suspected, so 3-day methyl prednisolone pulse therapy was done. Initial creatinine rise might be due to hemoglobinuria, and high-dose steroid itself is helpful for hemolysis by autoantibody, and it is difficult to clarify the causes of tubulitis and tubular necrosis, and the impact of hemoglobinuria on graft renal function decrease.

Since hemolysis due to autoantibody is very rare and most often mild and resolves spontaneously, we do not think aggressive prophylactic measures such as graft irradiation is needed. But in severe cases like this, we recommend the consideration of plasmapheresis, cyclosporin replacemant for another immunosuppressant, and high-dose steroids. Transfusion should be of donor type to avoid further hemolysis.

In cases of hemolysis of minor ABO mismatched kidney transplantation, graft-versus-host reaction rarely occurs but the possibility must be considered. In most cases, it resolves spontaneously and kidney function normalize within 2-3 months, but if severe hemolysis occurs, specific measures as above and close observation of graft renal function are needed.

한 글 요 약

IgA신병증으로 말기 신부전에 도달한 B형 혈액형의 9세 남아가 O형 혈액형의 아버지로부터 신이식을 시행받았다. 환아는 16개월 간 복막 투석 중이었으며 이전에 수혈받은 병력은 없었다. 이식 9일째 혈관내 용혈이 발견되었으며 항 B 항체 형성이 확인되었다. 저자들은 공여자의 신장과 함께 이동한 림프구가 일으킨 자가 면역 용혈성 빈혈로 진단하고 사이클로스포린 투여를 중단하였다. 용혈성 빈혈은 회복되었으나 이식 18일째 이식 신 기능 저하가 발견되어 이식 신 생검을 시행하여 급성 거부를 확인하고 스테로이드 충격 요법을 시행하였다.

저자들은 ABO 부적합 신이식 후 발생한 용혈성 빈혈 1례를 경험하여 보고하는 바이다.

중심단어: 용혈성 빈혈, 자가항체, ABO 부적합 신이식

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