Concomitant Parvovirus B19 and CMV Infection in a Child with Kidney Transplant

Abstract

Parvovirus B19 is a common human infection worldwide and is typically self-limiting in healthy persons but immunocompromised patients require specific treatments. Pretransplant B19 screening doesn't seem to be important or have any impact on the transplantation process but cytomegalovirus (CMV) study is crucial. We present a kidney-transplanted child infected by parvovirus B19 and cytomegalovirus presented with intractable anemia and raised creatinine.

Keywords: *Anemia, B19, CMV, Kidney transplant, Parvovirus*

Introduction

Parvovirus B19 is a treatable cause of anemia in kidney transplant recipients. A high index of suspicion is required to detect any other reactivated or opportunistic infections such as cytomegalovirus (CMV) and BK virus as they may present atypically or be masked in the setting of unusual or complicated clinical presentations.

Case Report

A 14-year-old boy with kidney failure due to vesicoureteral reflux received a deceased-donor kidney transplant. He received induction anti thymocete glubuline (ATG) 4.5 mg/kg followed by mycophenolate mofetile (MMF), tacrolimus, and prednisone. During the post-transplant period, the hemoglobin level remained stable in the range of 11–12 gr/dL until 8 weeks when he started complaining of dizziness and weakness. Investigations showed normocytic and normochromic anemia (Hb 7.5 g/dL), leukopenia (WBC 2800/mL), and a platelet count of 74000/mL. The corrected reticulocyte count was 0.2%. Serum vitamin B12 and iron indices were in the normal range. Hemolytic screening tests such as the Coomb's test and lactic dehydrgenase (LDH) were negative. There was marrow hypoplasia without any blast in bone marrow aspiration and biopsy specimens. As the hemoglobin level decreased to 5.4 gr/dL, packed cells with leuko-filter were transfused and tacrolimus and MMF were decreased. He was readmitted 2 weeks later with the same complaints. At this time, the hemoglobin level was 6.4 g/dL and the reticulocyte count was 5%. At this time, the polymerase chain reaction (PCR) test of the blood and bone marrow was positive for parvovirus B19; we administered IVIG 2 g/Kg weekly for 4 weeks. Pancytopenia continued, however, and serum creatinine started rising. At this time, his CMV PCR showed a viral load of 13000. We started ganciclovir and stopped MMF. The serum creatinine came down, pancytopenia got better, and hemoglobin and reticulocyte count increased. The serum vitamin B12 level was low and vitamin B12 therapy was commenced. After completing IVIG and ganciclovir course, he was discharged with a prescription of prednisolone, tacrolimus, and vit. B12 supplements, MMF, and valganciclovir. The patient's symptoms improved, and hemoglobin went up to 8.7 gr/dL. Hemoglobin normalized at 4 weeks. MMF was started again and the dosage increased cautiously. The hemoglobin level remained stable at around 11.5 gr/dL during a 2-month follow-up with no further relapse. The CMV viral load decreased and creatinine came down to normal and remained stable during the next 6 months. Table 1

Table 1: Serial laboratory finding of the patient and their normal values

Parameter (Normal range)	At transplantation	2nd week	8th week	10th week	14th week	22th week
Cr (0.5–1.1) mg/dL	8.6	1.1	1.2	1.2	1.5	1
B12 (200–900 pgr/mL)	400	300	310	120	145	350
Iron (60–170 micgr/dL)	90	110	120	100	110	120
Hb (12–14 gr/dL)	11.3	11.2	7.5	6.5	8.7	11.5
WBC (4500–10000 cell/mL)	8200	1500	2800	3900	4300	6200
Platelet Count (150000–450000/mL)	325000	380000	74000	120000	165000	280000
Retic. count (0.5-2.5/mL)	1%	-	0.2%	0.5%	0.7%	1%
B19 (qPCR)	-	-	Neg	Pos	Neg	Neg
CMV Ab (IgG)	D+R+	-	-			
PCR After transplant	-	-	Neg	13000	5000	Neg
EBV Ab (IgG)	D+R+	-	Neg	Neg	Neg	Neg
EBV AB (IgM)	D+R+	-	Neg	Neg	Neg	Neg
BK (PCR)	-	-	Neg	Neg	Neg	Neg

Cr: Creatinine; Hb: Hemoglobin; WBC: White Blood Cell Count; PCR: Plymerase Chaine Reaction Assay; CMV: Cytomegalovirus Virus; EBV: Epstein Bine Virus; Ab: Antibody.

demonstrates serial laboratory finding of the patient and their normal values.

Discussion

About 39% of kidney transplant recipients (KTR)s are affected by chronic anemia and almost 9% of them are erythropoietin-resistant.[1,2] Increased use of induction therapy to prevent early acute rejection may have increased parvovirus B19 infections.[1] Most seronegative KTR of B19-positive organ donors became infected within 1 month and may develop persistent refractory anemia with reticulocytopenia.[3] Immunosuppression is the major risk factor of infections in KTR as well as anemia, which improves when the immunosuppression is lowered or stopped.[3,4] ATG-induced immunosuppression poses a higher risk of infections compared to basiliximab.[2,5] Coinfection of parvovirus B19 and other viruses, such as CMV and human herpes virus 6, have also been reported by Barzon *et al*.[5] The cornerstone of the treatment of B19 infection is decreasing immunosuppressives and administration of IVIG. It is also important to avoid erythropoietin while treating B19 infection as it can lead to the emergence of resistance of the virus to the proven treatments.[3] This is more relevant, in those who receive higher doses of immunosuppressives.[6]

Conclusion

Awareness and concern for any potentially serious underlying and unseen illnesses is required in all solid organ recipients. A high index of suspicion should be maintained in the post-transplant phase, especially those who have received higher doses of immune suppressive agents.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

Conflicts of interest

There are no conflicts of interest.

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