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Case Report

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A Case of Chickenpox Developing 11 Years after Renal Transplantation

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Abstract

In solid organ transplant recipients, it is recommended that the necessary vaccinations be completed at least 4 weeks before transplant. Chickenpox infection in adulthood can lead to serious clinical conditions such as pneumonia, hepatitis, and central nervous system infections. Herein, the case of chickenpox in a 36-year-old female patient with renal transplantation for end-stage renal disease due to vesicoureteral reflux 11 years previously and without a history of chickenpox or its vaccination before and after transplantation is reported. In this case, because of the development of thrombocytopenia associated with intravenous acyclovir, treatment was successfully concluded with oral valacyclovir.

Keywords: Chickenpox, renal transplant, vaccination

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INTRODUCTION

Varicella zoster virus (VZV) is a human herpes virus known as human herpes virus-3 (HHV-3). The only known carriers of HHV-3 are humans, and it causes two clinical scenarios. Chickenpox is a primary disease that usually occurs in childhood and is characterized by vesicular eruptions on the erythematous base, starting with red papules. Herpes zoster is a recurrent viral infection, which remains latent in the dorsal root ganglia after primary infection, and it is common in advanced age (1). Although chickenpox usually occurs in children aged <15 years, it may cause severe clinical manifestations in adulthood, such as pneumonia, hepatitis, and central nerve system infections. Nowadays, in addition to routine childhood vaccination recommendations, it is suggested that all individuals who are not immune to chickenpox in adulthood should be vaccinated with two doses at 1-month intervals. In vaccination recommendations for special adult groups, primary immunization in solid organ recipients is suggested at least 4 weeks prior to transplantation. However, if vaccination cannot be performed before transplantation, it should be performed during the follow-up of post-transplant cases (2). Herein, a case of acquired chickenpox in an immunocompromised host who had undergone renal transplantation for end-stage renal disease due to vesicoureteral reflux 11 years before and who had no history of chickenpox or its vaccination before and after transplantation is presented.

CASE PRESENTATION

A 36-year-old female patient underwent live renal transplantation due to vesicoureteral reflux-induced end-stage renal disease in 2007 and received immunosuppressive therapy with tacrolimus 1 mg (2×1)/day, prednisolone 5 mg (1×1)/day, and azathioprine 50 mg (2×1)/day. She presented no history of rejection in the post-transplant follow-up. She worked as a primary school teacher. Eleven years after renal transplantation, the patient presented to the external center about

1 week before her admission to our clinic primarily because of itchy, vesicular-exanthematous rash and oral rash spreading throughout the body starting from the scalp. Two doses of cefazolin followed by ampicillin were administered with a preliminary diagnosis of urinary tract infection. However, her complaints did not improve, and she presented to our clinic due to chills and shivering and was followed up with a preliminary diagnosis of chickenpox. She presented no history of chickenpox or vaccination for it before and after renal transplantation. She reported that a child in her primary school has developed chickenpox a few weeks before the onset of her complaints. On routine hemogram, leukocyte count was 3.76×10^3/mL, neutrophil count was 40%, lymphocyte count was 48.2%, hemoglobin level was 10.2 g/dL, and platelet count was 170×10^3/mL; results of liver function tests were normal. Creatinine level was 0.99 mg/dL; eGFR was >60 mL/min/1.73 m^2; proteinuria was <150 mg/day; and C-reactive protein level was 2 mg/dL (N<0.5 mg/dL). Intravenous acyclovir 3×10 mg/kg was initiated, but chickenpox zoster immunoglobulin (VZIG) was not administered. Topical treatment was rearranged by a dermatology physician, and immunosuppressive treatment was rearranged by nephrology. Azathioprine treatment was discontinued and replaced with tacrolimus, and prednisolone was recommended. No growth was observed in three sets of blood cultures examined during the febrile (inflammatory) period. Varicella zoster Immunoglobulin M (IgM) was positive in the blood. Pneumonic infiltration was not detected on the chest radiography. After 4 days of acyclovir treatment, the platelet count became 20×10^3/mL. Since there was no evidence of active bleeding, platelet replacement was not performed. There was no decrease in leukocyte count and hemoglobin level.

DISCUSSION

It is essential to prevent the development of infections due to their rapid and severe progression following renal transplantation, high morbidity and mortality rates, and the fact that some infections (e.g., influenza) may trigger graft rejection (3). Pre-transplant serological screening and completion of all necessary vaccinations in the early post-transplant period are the primary recommended methods for preventing possible infections (4).

Intensive immunosuppressive treatments administered after transplantation increase the risk of infection in the post-transplant period and decrease the expected antibody response of the body to vaccination (2). When infections develop, as noted in our case, immunosuppressive therapy should be reviewed and its dose should be reduced during active infection (5). However, dose reduction during immunosuppressive therapy also increases the risk of graft rejection (6). Because our patient had undergone transplantation 11 years before and presented no history of rejection, the risk of graft rejection as a result of dose reduction of immunosuppressive therapy was low. Arrangement of immunosuppressive treatment during active infection should be evaluated according to the patient's clinical condition and the drugs administered (7, 8).

Solid organ transplant recipients are anticipated to benefit from vaccination; thus, vaccination should be performed in such patients. It is important that primary vaccination be performed early before transplantation. However, when vaccination is not performed before transplantation, immune response is insufficient within the first 6 months following transplantation. It is recommended that the vaccination scheme be completed after the 6th month and that the development of antibody response be followed. However, vaccination with live vaccines after solid organ transplantation remains a controversial issue (2). Chickenpox vaccination is recommended in all susceptible individuals in the adult population. However, it is recommended primarily for groups at a high risk of contamination or contact (teachers of small children, caregivers, medical staff, and family members of immunocompromised individuals, among others). Our case, who is a primary school teacher, likely contracted the virus via droplet infection from a student with chickenpox 11 years after transplantation. Our patient was not vaccinated before transplantation; no serological screening was performed; and no routine vaccination was recommended during the routine follow-up.

Bacterial infections are frequent following renal transplantation and are often followed by viral infections (9). VZV infections usually occur in the first 5 years following renal transplantation (10). However, since it is the most intense period of immunosuppression, between the 1st and 6th months after transplantation, majority of the patients develop cytomegalovirus, Epstein–Barr virus, VZV, and human herpes virus-6 infections (11). In patients with solid organ transplantation, primary VZV is less common than VZV reactivation (12). However, as seen in our case, it may occur in the very late post-transplant period and as a primary infection. In a study by Duchini et al. (3), 1139 patients who underwent renal transplantation were followed up for 38 years in terms of the development of VZV infection after transplantation and the average time to infection development after transplant was found to be 2.13 years (min, 9 days; max, 19 years). This indicates the importance of vaccination given the risk of severe life-threatening primary VZV infection that may develop in special patient groups, such as solid organ transplant receivers, as well as of early diagnosis and initiation of antiviral treatment as soon as possible when infections develops (14, 15).

For patients undergoing renal transplantation who develop primary VZV infection, intravenous acyclovir or oral valaciclovir is recommended until the lesions are completely crusted (16). In our case, due to the development of thrombocytopenia on the 4th day of intravenous acyclovir treatment introduced upon the recommendation, the treatment was switched to oral valaciclovir. Thrombocytopenia may also develop in the natural course of infection (17). However, no additional pathology in peripheral smear and improvement of platelet count after drug switching indicated the association with acyclovir. One should also be cautious of unforeseen side effects of drugs during treatment.

The latest recommendations of the Centers for Disease Control and Prevention in 2013, VZIG may be indicate up to 10 days after contact with people that have a proven diagnosis of chickenpox (18). Prophylaxis should be administered to individuals who have previously been shown to not be immune VZV and who are at an increased risk of possible complications of infection compared with the general population (immunocompromised individuals sensitive to chickenpox or pregnant women, among others). In our case, VZIG could not be administered because 10 days had elapsed since the contact and active infection was already present.

CONCLUSION

Since immunosuppressive therapy administered to renal transplantation patients may decrease their antibody response, chickenpox vaccination prior to transplantation is recommended. However, when vaccination is not performed, continued follow-up after transplantation and cooperation between the nephrology and infectious diseases units are important for preventing the clinical scenario in which the acquired infections in adulthood progress and result in high morbidity and mortality.

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