Original Article

Frequency of cytomegalovirus (CMV) in post renal transplant patients: A single center experience

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Objective: To retrospectively analyze post renal transplant patients to see the frequency of CMV infection, risk factors, its prevention and treatment at our Institutution.

Methodology: This study was done from January 2008 to January 2017 at Institute of Kidney Diseases, Peshawar, Pakistan. Clinical records and laboratory data were collected. CMV viral load was monitored by CMV quantitative nucleic acid testing.

Results: A total of 200 patients with 178 male and 22 females were studied. The frequency of CMC was 13.5 % (27 patients). All of these were seen after 3 months of renal transplantation.

Conclusions: The CMV infection is more common in patients with intense post renal transplant immunosuppression with induction therapy. Ganciclovir is an effective treatment against CMV infection. All patients who receive induction therapy must be given ganciclovir as a prophylaxis. Frequent CMV PCR should be done post prophylaxis where there is increase chance of CMV vireamia. (Rawal Med J 201;43:224-226).

Keywords: Cytomegalovirus, kidney transplantation, ganciclovir.

INTRODUCTION

Cytomegalovirus (CMV) is a Herpesviridae virus with a worldwide seroprevalence ranging from 30 to 97 %.[1] The seroprevalence of CMV is higher in developing countries up to 100% due to close contacts, low socio-economic status and over-crowding.[2] It is one of the major causes of morbidity, graft loss and mortality after renal transplantation.[3] With the advent of newer technologies, CMV infection is diagnosed earlier and treated promptly. This infection typically occurs within the first three months after transplantation.[4] The CMV related complications in post renal transplant patients is related to serostatus of the donor (D) and recipient (R). Renal transplant from a seropositive donor (D+) to a seronegative recipient (R-) has highest risk of CMV infection.[5] The CMV D+/R+ transplantation and CMV D-/R+ transplantation are considered to be of intermediate risk for the development of disease, and CMV D-/R- transplantation is considered low risk (5%).[6] The CMV is associated with chronic allograft loss, atherosclerosis and malignancy especially post renal transplant lymphoproliferative disorders (PTLDs) by direct cytopathic effect or indirect immunological injury.[7,8]

Current guidelines suggest ganciclovir or valciclovir prophylaxis for 3 months for D+/R+ and D?/R+ recipients and 6 months for D+/R? recipients, while no need for prophylaxis for sero-negative donor and recipient.[8] Risk of CMV disease, morbidity and mortality has been reduced with CMV prophylaxis in renal transplant recipients.[9] However, it is noted that 35% of the patients become vireamic within a year of post renal transplantation in spite of 3-6 months of ganciclovir prophylaxis.[4] The efficacy of the oral ganciclovir and intravenous ganciclovir is the same in preventing CMV infection and disease.[7] The data regarding CMV in post renal transplant patients is lacking in our country. The purpose of this study was to determine the frequency of CMV in post renal transplant patients in our transplant center.

METHODOLOGY

This retrospective analysis of 200 post renal transplant patients with stable renal functions was done from January 2008 to January 2017 at Institute of Kidney Diseases, Peshawar, Pakistan. Institute of Kidney Diseases (IKD), Peshawar is the only single

center doing the renal transplantation in KPK at the moment. All transplants were living related with good HLA matches. All donors and recipients were CMV seropositive before transplant. All received intravenous basliximab as an induction therapy. All were on triple immunosuppressive regime i-e cyclosporine, mycophenolate mofetil (MMF) and prednisolone. All recipients were given ganciclovir prophylaxis.

The patients with suspected CMV infection upon clinical presentation, physical examination, and laboratory results were diagnosed by detection of quantitative CMV PCR viral load more than 600 copies per milliliter in whole blood samples. All these patients were treated with IV ganciclovir with dose adjustments according to renal functions for 3 weeks. Response of the treatment was confirmed by doing whole blood CMV PCR that was negative.

RESULTS

A total of 200 renal transplant recipients were enrolled from January 2008 to January 2008. All were living related kidney transplantation from the close family members. Out of 200 patients, 178 were male and 22 were female recipients. Mean age of the recipient was 34.2 years and donor was 30.7 years (Table).

Table. Characteristics of transplant recipients.

Patients (Total):	200
Male	178(89%)
Female	22(11%)
Mean age:	
Recipients	34.2 years
Donors	37.7 years
Frequency of CMV	27 (13.5%)

The frequency of cytomegalovirus vireamia was noted in 27 (13.5%) patients. All patients (recipients and donors) were CMV IgG seropositive status. All recipients were on triple regime cyclosporine, MMF and prednisolone. There was no rejection noted in patients with CMV vireamia. All responded well with intravenous ganciclovir with CMV PCR negative after 3 weeks of treatment without any complication.

DISCUSSION

Cytomegalovirus infection is the most common post-renal transplant viral infections in 1st 3-6 months. It causes increased morbidity, mortality and graft loss.[6] CMV infections can develop in 10% to 60% of kidney transplant patients without prophylaxis and treatment. It occurs early during the first 3 months after transplantation at the time of the highest immunosuppressive load.[10]

In our study, the prevalence of CMV disease was 13.5%, which is much lower than other studies.[11] In our study, all kidney transplant donors (D+) and recipients (R+) were seropositive, which is well studied in different developing countries with seropositivity of 100% due to low socioeconomic status and overcrowding.[12] However, it is quite low in developed countries like Europe and USA.[13] But some studies also had a higher prevalence than our study (14% to 38%).[13] The reason for this difference was due to the serologic incompatibility of CMV, which lead to the highest risk of CMV disease.[14]

In our study, there was no effect of the type of immunosuppressive regimen on the CMV prevalence. Also, diabetes mellitus and hypertension were not associated with the incidence of CMV disease.[15]

Although exact duration of prophylaxis is not defined but the current recommendations suggest 3 months, which can be extended to 6 months in patients who receive induction therapy like ATG and basliximab.[16] All these patients with CMV infection were treated with 2-3 weeks course of 5mg/kg intravenous ganciclovir every 12 hours in patients with normal renal allograft function.[17] While dose reductions was made in patients with low renal functions.[18] there were no complications noted during treatment of CMV infection.

The study limitations include the sample size of the patients may be not big and we did the study at a single center. However, we need to do more studies on CMV in post renal patients at a multi-center level with bigger sample size.

CONCLUSION

The frequency of CMV disease in kidney transplant recipients in our region is relatively low (13.5%). Diabetes and hypertension were not risk factors for

CMV disease as well as no effect of the type of immunosuppressive regimens. The frequency of CMV disease was more in patients with induction therapy with ATG and basliximab. All patients with CMV diseases responded well with intravenous ganciclovir for 3 weeks. The first 6 months after transplantation are considered high risk period for CMV disease, hence monitoring of the patients by PCR is highly recommended. All patients should be given Ganciclovir prophylaxis for 3-6 months according to serostatus of the CMV.

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