# ABSTRACT




## Introduction

Cytomegalovirus (CMV) is the most important opportunistic viral pathogen in immune suppressed population including renal transplant recipients. Renal transplant recipients could acquire cytomegalovirus infection either from donor organ or reactivation of own cytomegalovirus latency. CMV disease occurs as a result of infection only in the presence of immune suppression. Primary CMV infection has the highest risk of progression to CMV disease in renal transplant recipients. CMV disease can cause severe morbidity and mortality among them. Appropriate CMV diagnostic assays are very useful to make correct diagnosis of CMV disease as early antiviral treatment results in good outcome. CMV polymerase chain reaction (PCR) assay for different blood components and CMV antigenemia assay for peripheral blood leukocytes are thought to be useful diagnostic assays. But, interpretations of above test results have become complicated as these tests might detect latent virus or asymptomatic viral replication in the absence of CMV disease.

## Methodology

In this study, 48 renal transplant recipients from nephrology units of National Hospital, Sri Lanka and General hospital, Sri Jayawardenapura were tested using cytomegalovirus (CMV) polymerase chain reaction (PCR) assay for both plasma and peripheral blood leukocytes (PBL) and CMV antigenemia assay for PBL. Fourteen out of 48 recipients were in the initial 6 months period after transplant surgery (Group A), while the others had passed the initial 6 months period (Group B) when they were tested. Plasma CMV PCR assay and CMV antigenemia assay were repeated two to three months later on the recipients who initially became positive for them.

## Results

All 48 were asymptomatic renal transplant recipients with pre-transplant CMV exposure as indicated by CMV seropositivity. None of them became positive for CMV antigenemia assay. While plasma CMV PCR positivity rate was 35.7 % (5 out of 14) in group A, it was only 5.8% (2 out of 34) in group B. The positivity rate of PBL CMV PCR assay in the two groups of A and B were respectively 35.7 % (5 out of 14) and 23.5 % (8 out of 34). Statistically significant difference in PCR positivity rates between groups A and B, was shown only by plasma CMV PCR assay. All plasma CMV PCR positive recipients remained asymptomatic and became negative for the repeat assay two to three months later. Overall PBL PCR positivity rate was higher (27%) than plasma PCR positivity rate (14.5%) as expected. But this difference was not statistically significant.

## Discussion

Incidence of CMV replication in blood better correlated with plasma CMV PCR results than PBL CMV PCR results. But, none of the plasma CMV PCR positive recipients became symptomatic. They were negative for the repeat assay two to three months later indicating an increased incidence of asymptomatic CMV replication during the initial six months period after transplantation. This may be due to intensive iatrogenic immune suppression during this period. However, none of them progressed to CMV disease as all these were recurrent infections in recipients with serological evidence of previous exposure to CMV. All 48 asymptomatic recipients were negative for CMV antigenemia assay indicating its low sensitivity to detect CMV activity in blood compared to plasma CMV PCR assay.

## Conclusions

Plasma CMV PCR results seem to correlate well with the incidence of active CMV infection in blood without being affected by CMV latency unlike the results of PBL CMV PCR assay. Therefore, in developing a semi-quantitative assay to predict CMV

disease on renal transplant recipients (to start pre-emptive ganciclovir therapy on them after the surgery), the plasma CMV PCR assay would be better than PBL CMV PCR assay. Renal transplant recipients are at a higher risk of developing CMV disease during the initial six months period after transplant surgery as evident by the high plasma CMV PCR positivity rate during this period compared to the period beyond that. CMV disease incidence is found to be low in pre-transplant CMV seropositive recipients despite transient active CMV replications in their blood. CMV antigenemia assay seems to be less sensitive in detecting active cytomegaloviral infection compared to plasma CMV PCR assay.