Data of CMV Infection before and after Kidney Transplantation and Incidence of CMV infection in South East Asia

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Cytomegalovirus (CMV) is one of the major infections after kidney transplantation (KT). Significant impact of CMV on morbidity and mortality among KT recipients and its deleterious effects on graft function is well known. Nevertheless, clinical issues on the prevention, diagnosis and management of CMV infection might be different among country.

It is generally well accepted that CMV disease risk is highest among KT patients with no preexisting CMV specific immunity. Assessing the CMV seroprevalence status pre transplant has been indicated as a significant determinant factor for CMV disease (1). Nevertheless, the CMV seropositivity rate varies among countries, with a highest rate in South America, Africa and Asia and lowest in Western Europe and United States (2-10). The impact of CMV D+/R- on symptomatic CMV infection post KT might be less in Asian, as compared to the Western. Earlier experience in Thailand also showed that majority (>97%) of KT patients was CMV D+/R+ (11-13).The incidence of symptomatic CMV infection (CMV disease/syndrome) was 4.6% when T-cell–depleting antibody was rarely (0.46%) used (11). Subsequent study from our country following introduction of the T-cell–depleting antibody has shown that the incidence rate of CMV disease was slightly higher (6.67%), and highlighted the older recipient age and use of antithymocyte globulin as risk factor for CMV infection (13). From a local experience in Thailand, burden of symptomatic CMV infection shadows what have occurred in the western countries in 19 centuries. Opportunistic co-infection was a common presentation at the CMV diagnosis (11). Cases of CMV disease were mainly GI. Nevertheless, severe pneumonitis cases are also seen over the past 10 years of my own experience. Ganciclovir and bactrim are often empirically started while invasive investigation is undertaken. Adverse effect, particularly drug induced neutropenia and allograft dysfunction is often noted. Prevention and treatment of CMV reactivation/disease remains a challenge worldwide. Despite the increasing knowledge, clinical factors have lacked the accuracy in predicting patients who will develop the CMV infection/disease. Viral load thresholds for initiating treatment are also not well defined. Unlike many other resource available setting, prevention of CMV by mean of blood viral load monitoring or anti-CMV prophylaxis remain mostly not feasible in Thailand. Early vigilance and recognition of CMV disease is what majority of Thai transplant centers currently focus on. Prior to the current era, diagnosis of CMV has relied on blood CMV antigenemia/viral load. Recently, commercialized tests using the real-time polymerase chain reaction for detection of blood CMV viral load are available. We recently showed that the threshold for diagnosis of CMV disease by realtime-PCR assay, a test which allows wider dynamic range for detecting copies of CMV DNA, is lower than our previous study using the older PCR platform. Measuring the CMV specific T cell response has been an area of interest in many research centers. Test has been utilized as marker to predict post prophylaxis CMV in D+/R- as well as CMV replication in R+ KT patients. Adapting the latter to patients in South East Asia might be desirable, in order to focus those R+ population who is at risk for CMV or to select those who would require treatment at the onset of viremia.

References

1. Razonable RR, Humar A; AST Infectious Diseases Community of Practice. Cytomegalovirus in solid organ transplantation. Am J Transplant. 2013;13 Suppl 4:93-106.
2. Cannon MJ, Schmid DS, Hyde TB. Review of cytomegalovirus seroprevalence and demographic characteristics associated with infection. Rev Med Virol. 2010; 20:202-13.
3. Urwijitaroon Y, Teawpatanataworn S, Kitjareontarm A. Prevalence of cytomegalovirus antibody in Thai-northeastern blood donors. Southeast Asian J Trop Med Public Health. 1993;24 Suppl 1:180-2.
4. Kositanont U, Wasi C, Chandanayingyong D, Thongcharoen P. Prevalence of cytomegalovirus antibodies in Thai blood donors. Asian Pac J Allergy Immunol. 1985;3(2):179-82.
5. Kothari A, Ramachandran VG, Gupta P, Singh B, Talwar V. Seroprevalence ofcytomegalovirus among voluntary blood donors in Delhi, India. J Health Popul Nutr. 2002;20:348-51.
6. Adjei AA, Armah HB, Gbagbo F, Boamah I, Adu-Gyamfi C, Asare I. Seroprevalence of HHV-8, CMV, and EBV among the general population in Ghana, West Africa. BMC Infect Dis. 2008;8:111.
7. Bate SL, Dollard SC, Cannon MJ. Cytomegalovirus seroprevalence in the UnitedStates: the national health and nutrition examination surveys, 1988-2004. Clin Infect Dis. 2010;50:1439-47.
8. Furui Y, Satake M, Hoshi Y, Uchida S, Suzuki K, Tadokoro K. Cytomegalovirus(CMV) seroprevalence in Japanese blood donors and high detection frequency of CMV DNA in elderly donors. Transfusion. 2013;53(10):2190-7.
9. Conde-Glez C, Lazcano-Ponce E, Rojas R, DeAntonio R, Romano-Mazzotti L,Cervantes Y, Ortega-Barria E. Seroprevalences of varicella-zoster virus, herpes simplex virus and cytomegalovirus in a cross-sectional study in Mexico. Vaccine 2013;31(44):5067-74.
10. Korndewal MJ, Mollema L, Tcherniaeva I, van der Klis F, Kroes AC, et al. Cytomegalovirus infection in the: seroprevalence, risk factors, and implications. J Clin Virol. 2015;63:53-8.
11. Watcharananan SP, Louhapanswat, Chantratita W, Jirasiritham S, Sumethkul V. Cytomegalovirus viremia after kidney transplantation in Thailand: predictors of symptomatic infection and outcome. Transplant Proc. 2012 Apr;44(3):701-5
12. Watcharananan SP, Pipatpannawong K, Mavichak V Prevalence of Pretransplant Infections among South East Asian Kidney Transplant Recipients. The 24th International Congress of The Transplantation Society July 2012, Berlin, Germany
13. Chiasakul T, Townamchai N, Jutivorakool K, Chancharoenthana W, Thongprayoon C, et al. Risk Factors of Cytomegalovirus Disease in Kidney Transplant Recipients: A Single-Center Study in Thailand. Transplant Proc. 2015;47:2460-4.