Jundishapur J Chronic Dis Care. 2016 January; 5(1): e32041. doi: 10.17795/jjcdc-32041

Published online 2016 January 09. **Letter**

Routine Screening for Cytomegalovirus Infection in Immunosuppressed Patients: Can the Diagnostic Tests Alone Be Reliable?

Mishar Kelishadi,[1] Mohammad Mojerloo,[2] Pezhman Hashemi,[1] and Alijan Tabarraei[3,*]

[1]Student Research Committee, Department of Microbiology, Golestan University of Medical Sciences, Gorgan, IR Iran
[2]Department of Hemodialysis, 5th Azar Hospital, Golestan University of Medical Sciences, Gorgan, IR Iran
[3]Infectious Diseases Research Center, Department of Microbiology, Golestan University of Medical Sciences, Gorgan, IR Iran

*Corresponding author: Alijan Tabarraei, Infectious Diseases Research Center, Department of Microbiology, Golestan University of Medical Sciences, Gorgan, IR Iran. Tel: +98-1732422652, Fax: +98-1732440225, E-mail: alijant@yahoo.com

Received 2015 August 1; **Revised** 2015 August 20; **Accepted** 2015 September 8.

Keywords: Cytomegalovirus Infections, Diagnosis, Polymerase Chain Reaction, Serology

Dear Editor,

Cytomegalovirus (CMV) is a ubiquitous DNA virus belonging to the herpes family that causes morbidity and mortality in immunosuppressed patients, particularly in those requiring blood transfusions, such as patients undergoing hemodialysis, organ transplant recipients, and individuals who lose blood following a serious accident or surgery (1).

CMV seropositivity rate among the adult populations worldwide ranges from 40% in the developed countries to 100% in the developing countries (1, 2). A seropositivity rate of 77.4% for anti-CMV immunoglobulin (Ig) G has been reported in Iran, showing evidence of a widespread previous CMV infection and increased CMV reactivation risk rate in the hosts (3).

Although several diagnostic tests, including virus culture, shell-vial assay, serological tests, antigenemia, and nested polymerase chain reaction (PCR), are available for either direct or indirect detection of human CMV infection, Nested PCR proved to be more sensitive for diagnosis of the infection than any other tests (1, 4).

In the developing countries, especially in Iran, the screening for cytomegalovirus infection is performed only for special groups of patients and is primarily based on the serological tests.

A total of 260 plasma samples of different patient groups, including 140 patients undergoing dialysis, 20 renal transplant recipients, 100 blood bags, were separately analyzed in our lab by utilizing serological assays for the detection of CMV IgM antibodies and by CMV-DNA amplification to diagnose active CMV infection (unpublished data). Of the 260 samples, 14 (5.4%) were positive for CMV infection. Viremia and anti-IgM CMV positivity were detected in 2.3% (6/260) and 3.07 % (8/260) samples, respectively. None of the samples was positive for both anti-IgM CMV and CMV-DNA. A time lapse between the CMV infection and production of IgM antibody is suggested, which is attributed to a delay in the immune system response. Therefore, CMV IgM antibodies might be undetectable during a primary infection in immunocompromised individuals. In addition, the IgM antibody may be detected up to 1 year after an acute infection. In this regard, the nested PCR assay may show a negative result (1, 4-6).

Our findings support many studies demonstrating the usefulness of serological tests for determining cytomegalovirus seroprevalence. Furthermore, the polymerase chain reaction test can be used for a rapid and accurate analysis, but relying entirely on the results of one test alone is not advisable. Therefore, a single test cannot be used for monitoring a previous or active (primary/reactivated) CMV infection (1, 4-7).

In conclusion, patients with renal failure may enlist for a kidney transplant or continue with dialysis. However, matching seronegative donors with seronegative recipients (blood/organs) is necessary to reduce the risk of CMV infection. Thus, CMV infection can be prevented by concomitant detection of IgM/IgG CMV antibodies and CMV DNA.

Acknowledgments

We thank the Student Research Committee of Golestan University of Medical Sciences for the continuous encouragement during this study.

Footnotes

Authors' Contribution: Alijan Tabarraei contributed to project management, interpretation of data, critical revision, and final approval of the study and writing the manuscript. Mishar Kelishadi was involved in all steps of experimental work, manuscript preparation, interpreta-

tion of data, and statistical analysis. Mohammad Mojerloo contributed to the interpretation of data, critical review, and comments. Pezhman Hashemi contributed to data collection and sampling.

Funding/Support: This project was supported by Student Research Committee, Golestan University of Medical Sciences (Grant No. 911215163).

References

1. Sia IG, Patel R. New strategies for prevention and therapy of cytomegalovirus infection and disease in solid-organ transplant recipients. *Clin Microbiol Rev.* 2000;**13**(1):83–121. [PubMed: 10627493]
2. Ocak S, Duran N, Eskiocak AF. Seroprevalence of cytomegalovirus antibodies in haemodialysis patients. *Turkish J Med Sci.* 2006;**36**(3):155.
3. Sepehrvand N, Khameneh ZR, Eslamloo HR. Survey the seroprevalence of CMV among hemodialysis patients in Urmia, Iran. *Saudi J Kidney Dis Transpl.* 2010;**21**(2):363–7. [PubMed: 20228534]
4. Ross SA, Novak Z, Pati S, Boppana SB. Overview of the diagnosis of cytomegalovirus infection. *Infect Disord Drug Targets.* 2011;**11**(5):466–74. [PubMed: 21827433]
5. Revello MG, Gerna G. Diagnosis and management of human cytomegalovirus infection in the mother, fetus, and newborn infant. *Clin Microbiol Rev.* 2002;**15**(4):680–715. [PubMed: 12364375]
6. Ziemann M, Juhl D, Gorg S, Hennig H. The impact of donor cytomegalovirus DNA on transfusion strategies for at-risk patients. *Transfusion.* 2013;**53**(10):2183–9. doi: 10.1111/trf.12199. [PubMed: 23581526]
7. Albanna EA, El-Latif RS, Sharaf HA, Gohar MK, Ibrahim BM. Diagnosis of congenital cytomegalovirus infection in high risk neonates. *Mediterr J Hematol Infect Dis.* 2013;**5**(1):e2013049. doi: 10.4084/MJHID.2013.049. [PubMed: 23936620]