

CYTOMEGALOVIRUS AND *Toxoplasma gondii* SEROPREVALENCE IN A BRAZILIAN LIVER TRANSPLANT WAITING LIST

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ABSTRACT: Cytomegalovirus (CMV) disease is a major cause of morbidity and mortality in solid organ transplantation. Disseminated toxoplasmosis after liver transplantation is a rare but fatal event. Serologic screening of the donor and the recipient is essential to prophylactic management, early diagnosis and therapeutic strategies to minimize the consequences of these infections. The aim of the present study was to determine the seroprevalence of CMV and *Toxoplasma gondii* (TG) in a Brazilian liver transplant waiting list (LTWL). Serological data were collected from 44 candidates on the LTWL between May 2003 and November 2004. Serological investigation of antibodies IgM and IgG against CMV (anti-CMV) and TG (anti-*T. gondii*) was performed using fluorometry commercial kits. IgG anti-CMV was positive in 37 patients (94.9%) out of 39 available results. There were not IgM anti-CMV positive results. Out of 36 analyzed patients, 22 (61.1%) presented positive IgG anti-*T. gondii* and none had positive IgM anti-*T. gondii*. The high CMV seroprevalence among our LTWL reinforces the need for appropriate protocols to avoid related complications, like reactivation and superinfection by CMV. Environmental and drug prophylactic strategies against primary infection and reactivation, as well as early diagnosis and treatment of toxoplasmosis complications, are essential for the good outcome of transplant patients.

KEY WORDS: Cytomegalovirus, liver transplantation, toxoplasmosis, *Toxoplasma gondii*, seroprevalence, waiting list.

CONFLICTS OF INTEREST: There is no conflict.

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INTRODUCTION

Cytomegalovirus (CMV) disease is a major cause of morbidity and mortality in solid organ transplantation. It is also associated with an increased risk of opportunistic infections, allograft injury and also seems to increase the risk of acute and chronic allograft rejection (6). Disseminated toxoplasmosis after liver transplantation is a rare event but in most cases results in a fatal outcome (4). CMV and *Toxoplasma gondii* (TG) infection complications have been due to primary infection or superinfection from a latently infected donor organ or to reactivation of latent organisms in a seropositive recipient. CMV can also be acquired from blood products (8, 9). Serologic screening of donor and recipient, previous to the transplant, is essential to prophylactic management, early diagnosis and therapeutic strategies to minimize the consequences of these infections (11). The aim of this study was to determine the seroprevalence of CMV and TG among our liver transplant waiting list (LTWL).

Serological data were collected from 44 candidates included on the Brazilian LTWL attended by the Division of Liver and Pancreas Transplantation of Botucatu Medical School Clinic Hospital, São Paulo State University – UNESP, Botucatu, São Paulo State, Brazil (22° 52' 48"S, 48°27' 00" W), between May 2003 and November 2004. Thirty-seven (84%) were men, with an overall mean age of 51.3 years (from 32 to 68 years). The income level was less than US\$ 1560.00 per year per patient in 18 (40.9%) subjects. Analysis of antibodies IgM and IgG against CMV (anti-CMV) and TG (anti-*T.gondii*) was performed with fluorimetry commercial kits. We used the results of the last serological samples obtained near the period of inclusion in the waiting list.

Thirty-nine (88.6%) patients had IgG anti-CMV test performed and it was positive in 37 (94.9%) of them. IgM anti-CMV was available for 38 patients (86.4%), and all of them had negative results. IgG and IgM anti-*T.gondii* were analyzed in 36 patients (81.8%). Twenty-two patients (61.1%) presented positive IgG anti-*T. gondii* and none had positive IgM anti-*T. gondii*, according to Table 1.

The high CMV seroprevalence among our LTWL was similar to that observed in Brazilian community (1). Seroprevalence was higher than in developed countries, which is probably related to the socioeconomic milieu (7, 12). These results reinforce the need for appropriate protocols to avoid related complications, like reactivation and superinfection by CMV, and to guarantee rational and universal use of more efficient drugs. TG seropositivity was not as high as that evidenced in Europe but it

was not as low as of the USA (11). Positivity index was similar to that of other Brazilian population groups and it was lower than that found in chronic renal failure candidates for renal transplant (5, 10). Environmental and drug prophylactic strategies against primary infection and reactivation, as well as early diagnosis and treatment of toxoplasmosis complications are essential for the good outcome of transplant patients (2-4, 11).

Table 1. Seroprevalence of Cytomegalovirus (CMV) and *Toxoplasma gondii* from 44 candidates included on the Brazilian liver transplant waiting list attended by the Division of Liver and Pancreas Transplantation of Botucatu Medical School Clinic Hospital.

Seroprevalence	Patients	
	(n)	(%)
IgG anti-CMV		
Positive	37	(94.9)
Negative	2	(5.1)
Total	39	(100)
IgM anti-CMV		
Positive	0	(0)
Negative	38	(100)
Total	38	(100)
IgG anti-<i>T. gondii</i>		
Positive	22	(61.1)
Negative	14	(39.9)
Total	36	(100)
IgM anti-<i>T. gondii</i>		
Positive	0	(0)
Negative	36	(100)
Total	36	(100)

REFERENCES

- 1 ALMEIDA LNB., AZEVEDO RS., AMAKU M., Massad E. Cytomegalovirus seroepidemiology in an urban community of São Paulo, Brazil. *Rev. Saúde Pública*, 2001, 35, 124-9.
- 2 BADEN LR., KATZ JT., FRANCK L., TSANG S., HALL M., RUBIN RH., JARCHO J. Successful toxoplasmosis prophylaxis after orthotopic cardiac transplantation with trimethoprim-sulfamethoxazole. *Transplantation*, 2003, 75, 339-43.
- 3 BARCAN LA., DALLURZO ML., CLARA LO., VALLEDOR A., MACIAS S., ZORKIN E., GERONA S., LIVELLARA B. *Toxoplasma gondii* pneumonia in liver transplantation: survival after a severe case of reactivation. *Transpl. Infect. Dis.*, 2002, 4, 93-6.
- 4 BOTTEREL F., ICHAI P., FERAY C., BOUREE P., SALIBA F., TUR RASPA R., SAMUEL D., ROMAND S. Disseminated toxoplasmosis, resulting from infection of allograft, after orthotopic liver transplantation: usefulness of quantitative PCR. *J. Clin. Microbiol.*, 2002, 40, 1648-50.
- 5 CARMO EL., SILVA MCM., XAVIER UAM., COSTA BO., PÓVOA MM. Inquérito sorológico de toxoplasmose em candidatos a transplante renal no Hospital Ofir Loyola, Belém, Pará, Brasil. *Rev. Panam. Infectol.*, 2004, 6, 15-7.
- 6 COUCHOUD C. Cytomegalovirus prophylaxis with antiviral agents for solid organ transplantation. *Cochrane Database Syst. Rev.*, 2000, 2, CD001320.
- 7 MUSTAKANGAS P., SEPPO S., PIRKKO Ä., MUTTILAINEN M., KOSKELA P., KOSKINIEMI M. Human cytomegalovirus seroprevalence in three socioeconomically different urban areas during the first trimester: a population-based cohort study. *Int. J. Epidemiol.*, 2000, 29, 587-91.
- 8 PARASITIC INFECTIONS. *Am. J. Transplant.*, 2004, 4, Suppl. 10, 142-55.
- 9 PEREYRA F., RUBIN RH. Prevention and treatment of cytomegalovirus infection in solid organ transplant recipients. *Curr. Opin. Infect. Dis.*, 2004, 17, 357-61.
- 10 REY LC., RAMALHO ILC. Seroprevalence of toxoplasmosis in Fortaleza, Ceará, Brazil. *Rev. Inst. Med. Trop. São Paulo*, 1999, 41, 171-4.
- 11 SCREENING OF DONOR AND RECIPIENT PRIOR TO SOLID ORGAN TRANSPLANTATION. *Am. J. Transplant.*, 2004, 4, Suppl 10, 10-20.
- 12 STRAUSS SE. Introduction to Herpesviridae. In: MANDELL GL., BENNETT JE. Eds. *Mandell, Douglas and Bennett's principles and practice of infectious diseases*. Philadelphia: Harcourt Health Sciences, 2000: 1557-64.