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Surveillance of γδ T Cells Predicts Cytomegalovirus Infection Resolution in Kidney Transplants

Hannah Kaminski [1], Isabelle Garrigue [2], Lionel Couzi [3], Benjamin Taton [1], Thomas Bachelet [3], Jean-François Moreau [4], Julie Déchanet-Merville [5], Rodolphe Thiébaut [6], Pierre Merville [7]

Affiliations

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Abstract

Cytomegalovirus (CMV) infection in solid-organ transplantation is associated with increased morbidity and mortality, particularly if a CMV mutant strain with antiviral resistance emerges. Monitoring CMV-specific T cell response could provide relevant information for patient care. We and others have shown the involvement of Vδ2(neg) γδ T cells in controlling CMV infection. Here, we assessed if Vδ2(neg) γδ T cell kinetics in peripheral blood predict CMV infection resolution and emergence of a mutant strain in high-risk recipients of kidney transplants, including 168 seronegative recipients receiving organs from seropositive donors (D+R-) and 104 seropositive recipients receiving antithymocyte globulins (R+/ATG). Vδ2(neg) γδ T cell percentages were serially determined in patients grafted between 2003 and 2011. The growing phase of Vδ2(neg) γδ T cells was monitored in each infected patient, and the expansion rate during this phase was estimated individually by a linear mixed model. A Vδ2(neg) γδ T cell expansion rate of >0.06% per day predicted the growing phase. The time after infection at which an expansion rate of 0.06% per day occurred was correlated with the resolution of CMV DNAemia ($r=0.91$; $P<0.001$). At 49 days of antiviral treatment, Vδ2(neg) γδ T cell expansion onset was associated with recovery, whereas absence of expansion was associated with recurrent disease and DNAemia. The appearance of antiviral-resistant mutant CMV strains was associated with delayed Vδ2(neg) γδ T cell expansion ($P<0.001$). In conclusion, longitudinal surveillance of Vδ2(neg) γδ T cells in recipients of kidney transplants may predict CMV infection resolution and antiviral drug resistance.

Keywords: cytomegalovirus; immunology; immunosuppression; kidney transplantation.

Figures

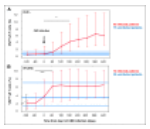

Figure 1. Kinetics of V δ 2...

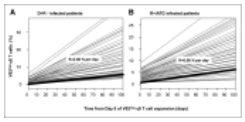

Figure 2. Estimation of V δ 2...

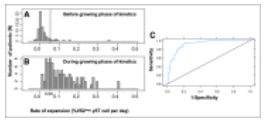

Figure 3. Estimation of the threshold of...

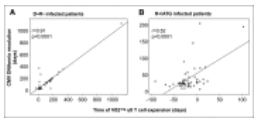

Figure 4. Time of V δ 2...

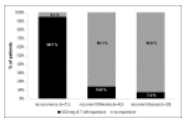

Figure 5. Absence of V δ 2...

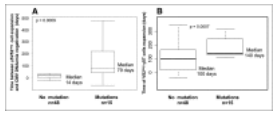

Figure 6. Vδ2 ^{neg} γδ T cell...

All figures (7)

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