CMV ELISpot assays are superior to the QuantiFERON CMV assay to predict protection from CMV reactivation in kidney and liver transplant recipients

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Cellular immunity plays a major role in the defense against Cytomegalovirus (CMV) infection, a common complication after transplantation. Assays detecting CMV specific cellular immunity may help to improve risk stratification and antiviral therapy. Thirty kidney (KTx) and 18 liver (LTx) transplant patients were enrolled in a prospective study. They were divided into two groups according to their CMV IgG status pre-transplantation: preemptive (donor-/recipient+, donor+/recipient+) and prophylaxis (donor+/recipient-). Two ELISpot assays using CMV IE1 and pp65 as stimuli, T-Track CMV (Lophius) and T-SPOT.CMV (Oxford Immunotec), were performed one month post-transplantation in the preemptive group or at the end and one month after prophylaxis. QuantiFERON CMV (Qiagen), an ELISA measuring IFN-gamma concentrations, was performed every 2-4 weeks (preemptive) or monthly (prophylaxis) parallel to the CMV viral load as determined by real-time PCR. The primary endpoint was defining a cutoff for the cellular immune response, which protects against CMV reactivation/infection.

Secondarily, we evaluated the performance of the three tests. The cumulative incidence of CMV reactivation was 57% (preemptive, CMV-DNA > 500 IU/mL) and 41% (prophylaxis, PCR CMV-DNA > 40 IU/mL). According to our preliminary data, in the preemptive group a cutoff of 19 spot-forming cells (SFC) to the T-Track CMV IE1 and of 130 SFC to the T-Track CMV pp65 corresponded with protection against reactivation. At the end of prophylaxis the TSPOT. CMV pp65 was the best marker to predict protection (cutoff of 54 SFC). QuantiFERON CMV was not predictive in any of the two groups. An excellent positive agreement was obtained between T-SPOT.CMV or T-Track CMV and CMV IgG (kappa = 1.000 or 0.905, respectively) whilst a moderate agreement was obtained forQuantiFERON CMV (kappa = 0.648). In conclusion, the two ELISpot assays were superior to functionally assess the CMV-specific immunity in transplant recipients.