27th ECCMID Vienna, Austria 22 – 25 April 2017

The congress of ESCMID

Session: EV009 Diagnostic virology

Category: 1g. Diagnostic virology (other than hepatitis & HIV)

22 April 2017, 08:45 - 15:30
EV0116

Assessment of cytomegalovirus-specific cell-mediated immunity for the prediction of cytomegalovirus disease in kidney and liver transplant patients: a pilot study

Gliga Smaranda*[1], Monika Lindemann[2], Kerstin Herzer[3], Oliver Witzke[4], Adalbert Krawczyk[5], Johannes Korth[6], Sotiria Bedreli[3], Peter A. Horn[7], Melanie Fiedler[5]

[1]*Uniklinik Essen; Transfusion Medecine*

[2]*Uniklinik Essen; Institut for Transfusion Medecine; Insitut for Transfusion Medecine*

[3]*University Hospital Essen; Clinic for General, Visceral and Transplant Surgery*

[4]*University Duisburg-Essen; University Hospital Essen; Department of Infectious Diseases*

[5]*University Hospital Essen; Institut of Virology*

[6]*University Duisburg-Essen; University Hospital Essen; Department of Nephrology*

[7]*Institut for Transfusion Medecine, University Hospital Essen*

Background: Cell mediated immunity (CMI) plays an important role in the defense against Cytomegalovirus (CMV) infection, a common complication after transplantation (Tx). Assays detecting CMV specific CMI may help the current management of CMV infection in solid-organ transplant (SOT) recipients, by allowing a better risk stratification and influencing the way antiviral therapy and prophylaxis are administered.

Material/methods: Kidney (KTx) and liver (LTx) transplant patients were enrolled in a prospective, longitudinal study from December 2015 to June 2016. Patients were stratified according to their CMV IgG serological status pre-Tx and were divided into two groups: preemptive (Donor-/ Receiver+, Donor+/ Receiver+) and prophylaxis (Donor+/ Receiver-). T-Track® CMV (Lophius) and T-SPOT® CMV (Oxford Immunotec) (ELISpots detecting IFNγ producing CD4+ and CD8+ T cells in response to stimulation with IE-1 and pp65) were performed at: 1 month post-Tx (preemptive group); end of prophylaxis and 1 month after (prophylaxis group). QuantiFERON® CMV (Qiagen) (ELISA quantifying CD8+ produced IFNγ after stimulation with 22 viral peptides) was performed every 2-4 weeks

(preemptive) or monthly (prophylaxis), parallel to the CMV viral load (PCR). The primary endpoint was determining a cutoff for the cellular immune response, which protects against CMV disease. Secondarily, we evaluated the performance of the three tests.

Results: 30 KTx and 18 LTx patients were included in the study. The cumulative incidence of CMV reactivation/infection was: 57 % (preemptive, PCR CMV > 500 IU/mL) and 40.7 % (prophylaxis, PCR CMV > 40 IU/mL). In the preemptive group a cutoff point of 18.5 spot-forming units (SFU) for the T-Track CMV IE1 (AUC=0.960, sensitivity 60 %, specificity 100 %) and 129.5 SFU for the T Track CMV pp65 (AUC= 0.640, sensitivity 60 %, specificity 80 %) were protective against reactivation. In comparison, the pp65 (T-SPOT CMV) was a marker of protection in the prophylaxis group (AUC=0.732, cutoff of 53.5 SFU, sensitivity 78.6%, specificity 50%). The QuantiFERON-CMV performed modestly in both groups (AUC=0.455 and AUC= 0.433 respectively). A perfect positive agreement was obtained between the T-SPOT CMV, T Track CMV and the CMV Ig G serology (kappa= 1 and 0.905 respectively) whilst a good agreement was achieved for the QuantiFERON CMV (kappa= 0.648). All patients with negative CMV serology at at time of study enrollment, had negative CMV specific CMI response (QuantiFERON, T-Track, T-SPOT).

Conclusions: T-Track® CMV and T-SPOT® CMV enable the functional assessment of CMV-specific CMI in KTx and LTx recipients, the later being the highest sensitive assay. In combination with CMV viral load monitoring, T-Track® CMV and T-SPOT® CMV could stratify patients at risk of CMV infection.