Cytomegalovirus post paediatric heart transplantation: a prospective study.

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CMV remains a major infectious complication after transplant. In paediatric heart transplantation it is implicated in accelerated coronary vasculopathy, which may be accentuated by lack of substantial CMV specific immunity.

We designed a prospective study of CMV in paediatric cardiac transplantation. CMV-specific immunity was investigated in relationship to CMV viral load. Cell-mediated immune response and the presence of soluble markers of inflammation were determined in blood samples of heart-transplanted children at regular intervals up to one year.

30 recent transplant recipients were enrolled prospectively. The presence of CMV-specific T cells and their ability to produce inflammatory cytokines was determined in peripheral blood mononuclear cells isolated from whole blood. Soluble markers of inflammation were measured in plasma, including CX3CL1 (fractalkine), an atypical chemokine relevant to the pathology of atherosclerosis and other vascular diseases.

CD8+T cells from children who had viremia within 12 weeks after transplant, were able to respond to viral stimulation between 16-32 weeks post-transplant. Lymphocytes from patients who had been immunologically primed by CMV following natural infection, but did not show reactivation/reinfection, responded to CMV stimulus earlier. The CMV specific responses were similar in those groups exposed to the virus at one year post-transplant.

From week 16 post-transplant, the levels of CD57+ CD8-T cells were increased particularly in the viremic group, where this cell population maintained effective cytotoxic potential, producing increasing amounts of Granzyme B. Furthermore, both the CMV seropositive and the viremic cohort showed augmented plasma levels of CX3CL1 when compared to the CMV negative group at the same time point. Titres remained high throughout the one year study period.

Our data indicate that T-cell immunity can be used to monitor the level of immunosuppression and to modulate the outcome of CMV infection, thus reducing the risk for long-term complications post-transplant. Elevated levels of CX3CL1 in the CMV exposed patients suggest that this chemokine has a central role in the development of cardiac allograft vasculopathy.