Mouse CMV infection delays antibody class switch upon an unrelated virus challenge

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Abstract

Poor immune protection upon vaccination is a critical determinant of immunosenescence. Latent Cytomegalovirus (CMV) infection has been associated with poor antibody responses to vaccination, but a causative role for CMV in the poor immune response requires experimental evidence and thus could not be confirmed in clinical studies. To test the hypothesis that latent CMV infection causes poor antibody responses, we infected young or adult mice with mouse CMV and challenged them with Vesicular stomatitis virus (VSV) at 15 or 18 months of age. Latent, but not primary infection with mouse CMV resulted in diminished neutralizing titers of the serum IgG fraction at day 7 post challenge, which recovered by day 14 post challenge. This phenomenon was specific for mice infected with mouse CMV, but not mice infected with other herpesviruses, like murine herpesvirus-68 or herpes simplex virus type 1, or mice infected with non-persistent viruses, such as influenza or Vaccinia virus. Hence, our data indicate a delay in IgG class-switch that was specific for the CMV infection. Herpesviral infections did not change the B-cell memory compartment, and increased the size of the effector-memory subset of blood CD4 T-cells only when administered in combination. Furthermore, CD4 T-cell response to VSV infection was maintained in latently infected mice. Therefore, our results argue that latent CMV infection impairs B-cell, but not T-cell responses to a challenge with VSV and delays antibody class-switch by a mechanism which may be independent of T-cell help

Keywords

- Cytomegalovirus; Herpes simplex virus type 1; Murine herpesvirus 68; Humoral response; In vitro neutralization; CD4 T-cell, Murine herpesvirus 68; Humoral response;