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Purpose: During infection, it is unclear whether ocular disease is the result of damage caused directly by the pathogen or indirectly by inflammation. Systemic infection with murine cytomegalovirus (mCMV), the homologue of one of the most common human pathogens, does not lead to viral replication in the eye. Thus, we investigated if systemic infection influences ocular immune surveillance.

Methods: Female BALB.B6-CT6 mice infected intraperitoneally with mCMV ($10^4$ pfu) were sacrificed at various times post-infection (pi). Following intracardiac perfusion with rhodamine-conjugated concanavalin-A (Con-A), iris and retinal whole mounts were stained for MHC-II, Iba-1 and isolectin B4 (IB4). Con-A+ intravascular leukocytes were enumerated in the retina and expression of MHC-II and the macrophage marker Iba-1 assessed in the retina and iris by epifluorescent and confocal microscopy. Viral replication was also measured.

Results: Compared with controls, mice infected with mCMV had large numbers of intravascular leukocytes in the retina from day 4 to day 10 pi. In the iris stroma of uninfected mice MHC-II expression was restricted to a subpopulation of Iba-1+ macrophages. By day 4 pi there were significantly less MHC-II+ cells in the iris stroma, despite strong MHC-II expression in vessels. A large increase of Iba-1+ MHC-II+ cells was seen in the iris from day 10 to 32, decreasing to baseline by day 60 pi. In the retina, strong MHC-II expression was detected along vessels from days 4 to 18 pi. In the subretinal space there was a...
significant increase in Iba-1+ macrophages, peaking at day 10 (172±18 vs 12± 1 cells/mm² in uninfected mice). Viral replication was not detected in the eye at any of the times tested.

Conclusions: These novel data define the effects of systemic CMV infection on the expression kinetics of MHC-II in the mouse retina and iris. These findings suggest that viral infection can unmask the eye to the immune system and might explain the various eye pathologies, including those autoimmune in nature, that accompany systemic viral infections.


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