Statin-induced immunomodulatory effects on human T cells in vivo


Statins are widely used for treatment of hypercholesterolemia. Recent experimental studies revealed that these drugs also exert anti-inflammatory effects. The aim of this study was to assess immunomodulatory effects of statins in humans in vivo. Twenty-seven healthy volunteers were analyzed for serum cytokines and acute phase proteins, HLA-DR and CD38 expression on T cells and superantigen-mediated T cell activation ex vivo before and after 14 days of statin treatment. First, simvastatin 40 mg was compared to atorvastatin 20 mg. Second, two different doses of simvastatin (20 and 40 mg) were tested. Atorvastatin treatment led to a significant down-regulation of HLA-DR and the CD38 activation marker on peripheral T cells, whereas simvastatin up-regulated both of these molecules. In contrast, superantigen-mediated T cell activation was inhibited by simvastatin and enhanced by atorvastatin. No significant effect of statin treatment on inflammatory serum markers was detected. Thus, immunomodulatory effects of statins on human T cells are first demonstrated in vivo and are differentially induced by two different statins: atorvastatin led to a major histocompatibility class II (MHC II) antigens down-regulation and may therefore be investigated for treatment of chronic transplant rejection; simvastatin inhibited superantigen-mediated T cell activation, which might explain reduced mortality of simvastatin-treated patients with staphylococcal bacteremia.

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