Abstract

Mesenchymal stem cells (MSC) defined as multipotent, nonhematopoietic stem cells have been shown to possess various immunosuppressive properties. Thus they can be used to attenuate transplant rejection and also for treatment of autoimmune diseases. But simultaneously with MSC patients take immunosuppressive drugs and there is no evidence how this medication affect MSC.

The goal of this study is to elucidate how frequently used immunosuppressive drugs cyclosporineA, mycophenolate mofetil, rapamycin, dexamethasone and prednisone influence immune-related parameters of mice and human MSC. Here we show that MSC from various sources are affected differentialy after short-term exposure of the tested immunosuppressants. Only cyclosporine A does not change immune-related parameters of mice MSC in the comparison to other immunosuppressants. However, cyclosporine A, mycophenolate mofetil and rapamycin enhance human MSC expression of TSG-6, PD-L1 and TGF-β which are involved in inhibition of lymphocyte proliferation and effector function, inhibition of dendritic cell maturation and in support of tolerogenic phenotype of macrophages. Although glucocorticoid drugs promote survival of human MSC and expression of Fas-L they reduce expression of molecules that mediate immunosuppression. In this respect, the best candidates for therapy using MSCs in the combination with immunosuppressive drugs are cyclosporineA, mycophenolate and rapamycin.

Key words

mesenchymal stem cell, cellular therapy, cyklosporine A, mycophenolate mofetil, rapamycin, dexamethasone, prednisone