Abstract

Immunosuppressive drugs have been used for many years for the treatment of autoimmune diseases and post-transplantation treatment. While these drugs have a lot of advantages, they also show several undesirable side effects. The most common side effects are higher blood pressure, lowered renal function and susceptibility to infections.

Therefore, in recent years there has been a demand for other medical approaches that do not exhibit the above-mentioned adverse effects. Among one of the newly tested approaches is the application of mesenchymal stem cells (MSCs), which possess several advantages such as immunomodulatory abilities, safety and relatively easy isolation, however, stem cell use alone has not yet provided sufficiently strong immunomodulation. Only a small part of research of MSCs is focused on their use in the combination with immunosuppressive therapy. Therefore, in my thesis I focused on the model which allows to reduce the dose of immunosuppressive drugs in the combination with MSCs. Combined therapy is more advantageous than both monotherapies thanks to lower dosages of these drugs used. It enables to decrease negative side effects of immunosuppressive drugs, when combined with MSCs to provide sufficient immunomodulation in comparison to classical therapy.

The aim of my work was to study the differences in experimental *in vivo* mouse model of transplantation. Changes in distinct T cell populations and related cytokine production were analysed in mice undergoing classical approach with the use of immunosuppressive drug cyclosporin A (CsA) and mice treated with combined therapy (CsA and MSCs). Taken together our results have shown a shift in balance of proinflammatory and anti-inflammatory immune reactions in the direction of anti-inflammatory, which has a positive effect on healing processes and graft acceptance.

Key words: mesenchymal stem cells, transplantation, inflammation, cyclosporin A, CsA