

Abstract

Introduction: Uveitis is an ocular inflammation affecting mostly people of working age. Uveitis is responsible for severe visual impairment despite of expanding new therapeutics. The animal models of uveitis were established, because the wide clinical variability of uveitis limits the studies in human medicine. The goal our project was to establish a reproducible model of experimental autoimmune uveitis in Czech Republic, and further on this model to observe the frequency of CD3⁺ and F4/80⁺ cells in retina, to assess the influence of microbial environment on intensity of intraocular inflammation and to test the therapeutical possibilities.

Material and methods: The C57BL/6J mice were immunized by retinal antigen (IRBP 1-20, interphotoreceptor retinoid binding protein), enhanced by complete Freund's adjuvant and pertussis toxin and mild posterior autoimmune uveitis was induced. The mice were bred in conventional and germ-free (gnotobiotic) conditions. The uveitis intensity was evaluated *in vivo* biomicroscopically and *post mortem* histologically on hematoxylin eosin stained sections according to the standard protocol. The histological eye specimen were analyzed also by immunohistochemistry and by flow cytometry. Each experiment was performed for 35 days. The conventional mice with uveitis were treated with oral antibiotics (metronidazole and ciprofloxacin) starting a week before induction and at the day of induction. Furthermore the effect of mycophenolate mofetil, cyclophosphamide and golimumab was tested in uveitis treatment.

Results: The model of experimental autoimmune uveitis was established in our laboratory facility and its stability and the reproducibility was verified. On histological sections after immunohistochemical staining the increasing concentration of CD3⁺ and F4/80⁺ cells in time was observed as well as the characteristic arrangement of retinal infiltrates with CD3⁺ cells in the center of and F4/80⁺ cells at its periphery. The lower inflammation intensity was proved in reduced microbial environment: in mice treated preventively by antibiotics and in germ-free mice. The effect of mycophenolate mofetil and cyclophosphamide was confirmed in treatment of experimental autoimmune uveitis.

Conclusion: The model of experimental autoimmune uveitis is an ideal tool to study the immunopathological mechanisms and therapeutical possibilities in basic research. This can contribute to effective treatment of intraocular inflammation.