Abstract

The present thesis is focused on studies of the importance of cholinergic, purinergic and nitrergic mechanisms in the healthy and inflamed rat urinary bladder, furthermore in which way specific pre-treatment affects the state of inflammation. Experiments were performed on prepared strips from normal healthy rats and cyclophosphamide-induced cystitis rats. In vitro contractile response of the strips to MeCh and ATP were investigated in the saline/CYP control group as well in the presence of five various antagonists and inhibitors. The rats were pre-treated by 4-DAMP (2mg/kg) as a M_3, M_5 muscarinic receptor antagonist; DPCPX (1mg/kg) as a $P1A_1$ purinoceptor antagonist; PSB1115 (1mg/kg) as a $P1A_{2B}$ purinoceptor antagonist; L-NAME (60mg/kg) as an inhibitor of eNOS and finally by suramin (10mg/kg) as a non-selective P2 purinergic receptor antagonist. Altered effects were observed via functional and morphological studies. The best results showed DPCPX and L-NAME pre-treated groups. It was found that DPCPX and L-NAME pre-treatments normalized contractile response to MeCh and ATP of the inflamed bladders and helped to reduce inflammatory signs. These in vitro functional findings evoke that $P1A_1$ receptor and nitric oxide are important pro-inflammatory factors since their inhibitions refine the state of inflammation. Morphological studies were foremost concerned on $P1A_1$ purinoceptor and M_5 muscarinic receptor expression and their alterations during cystitis. Immunohistochemical staining showed decreased number of both receptors in the inflamed bladders.