EFFECT OF CAPSAICIN AND DIMETHYL SULFOXIDE ON ION TRANSPORT IN THE SELECTED EXPERIMENTAL MODELS

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The aim of the present work was to determine the changes in ion transport in the selected epithelium-lined organs under influence of mechanical stimuli, and also to assess similarities and differences in reactions to capsaicin and dimethyl sulfoxide (DMSO) between trachea and caecum of rabbit and the skin of frog in this experimental setup. The experiments were conducted on rabbit trachea and caecum, and the skin of frog, Rana esculenta L. The experiments consisted in measuring transepithelial electrical potential (PD in mV) with Ussing apparatus, modified to enable testing of the effects of mechanical stimulation of organs and defined pharmacological treatments. It was demonstrated that the addition of DMSO to the stimulating fluid decreased reversible hyperpolarization (dPD) after mechanical stimulation by at least 50% in all studied groups. On the other hand, action of capsaicin was dependent on the organ studied as well as on experimental conditions (e.g. type of incubation). Capsaicin decreased PD and reaction to mechanical stimulation in trachea incubated in Ringer solution supplemented with amiloride. On the other hand, it did not influence electrophysiological parameters of the trachea following its incubation with bumetanide. Capsaicin did not change electrical potential or reactivity of rabbit caecum incubated with both amiloride and bumetanide. The administration of capsaicin on frog skin incubated with bumetanide caused inhibition of the reaction to mechanical stimulation, whereas during incubation with amiloride no changes were recorded in PD and dPD of the skin. The present study demonstrated that capsaicin and DMSO could modify processes of ion transport dependent on mechanical stimulation.

Key words: caecum, capsaicin, dimethyl sulfoxide, frog skin, ion transport, trachea

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