Effect of ambroxol on ion transport in selected animal models

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Abstract:
The aim of this study was to evaluate the effect of ambroxol on sodium and chloride ion transport in rabbit trachea and frog skin. Moreover, we tested frog skin as a model tissue in terms of its use for transepithelial ion transport studies. Our studies included measurements of some electrophysiological parameters (transepithelial electrical potential difference – Pd, and transepithelial electrical resistance – R) in the analyzed organs under various conditions of incubation, using the modified Ussing chamber. Ambroxol (ABX) was administered during and after mechanical stimulation with a soft jet of incubation fluid. The effect of ABX on the trachea and the skin depended on the solution used for incubation. Incubation in Ringer solution resulted in a reduced response to stimulation in both groups. On the other hand, amiloride applied for incubation did not influence the hyperpolarization response during ABX application. ABX applied on the trachea incubated with bumetanide slightly increased the response; if applied onto frog skin, however, ABX inhibited the response to mechanical stimulation. ABX did not alter transepithelial electrical resistance of either tissue. The studies have revealed that ABX inhibits stimulated transport of sodium ions in the studied organs, and that frog skin represents a good experimental model for studies of ionic currents.

Key words:
ambroxol, frog skin, ion transport, tracheal wall, Ussing method