

Asthma, respiratory allergy and cough

Changes in Airway's Defence Mechanisms Control Mediated via Voltage-gated Sodium Channels

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Expression of voltage-gated sodium channels (Na_v) was proved in the airways and the role of Na_v 1.7 and Na_v 1.8 in airway's defence reflexes control was confirmed. Activation of Na_v is crucial for cough initiation and airway's smooth muscle (ASM) reactivity, but if they regulate ciliary beating is not well known. Besides, airway's inflammation, e.g. in asthma, changes reflex and non-reflex defence mechanisms control. Thus, presented work evaluated involvement of Na_v 1.7 and Na_v 1.8 channels in airway's defence mechanisms regulation using blockers acute administration in healthy animals and in experimental asthma model. Airways allergic asthma was induced by ovalbumine on guinea pigs during 21 days. Acute administration influence was observed on ASM reactivity changes *in vivo*, number of cough efforts and cilia beat frequency (CBF). Na_v 1.7 blocker decreased ASM reactivity *in vivo*, number of coughs and CBF in healthy animals significantly. Otherwise blocker of Na_v 1.8 relieved clinical symptoms of asthma with high efficiency without adversely affecting CBF. Presented data confirmed that selective blockers of Na_v 1.8 would alleviate cough and bronchial hyperreactivity in asthmatic patients with no effect on CBF however selective blockers of Na_v 1.7 could negative affect the mucociliary transport.

Key words: bronchial hyperreactivity, ciliary beat frequency, cough, asthma therapy, Na⁺ channels