The influence of peripheral antitussive drugs on spatiotemporal features of coughing

Michal Simera[1], Ivan Poliacek[1], Marcel Veternik[1], Lukas Martvon[2], Denisa Berikova[1], Donald C Bolser[3]

[1] Comenius University in Bratislava, Jessenius Faculty of Medicine in Martin, Institute of Medical Biophysics, Martin, Slovakia; michal.simera@uniba.sk

[2] Comenius University in Bratislava, Jessenius Faculty of Medicine in Martin, Medical Education Support Center, Martin, Slovakia

[3] Department of Physiological Sciences, College of Veterinary Medicine, University of Florida, Gainesville Florida, U.S.A.

Antitussive drugs function at the peripheral, central, or both sites of cough-related neural pathways. Peripheral antitussives reduce the activity of cough sensors in the airways and/or alter the conduction of action potentials in afferent nerve fibers. However, their influence on spatiotemporal features of coughing is still unknown.

The actions of 3-Aminopropylphosphinic Acid (3APPi) and levodropropizine (Levo) on spatiotemporal characteristics of the cough motor pattern were tested after i.v. application in anesthetized spontaneously breathing cats. Spatio-temporal analysis of cough induced by mechanical stimulation of the trachea showed significant reductions in the cough number and the expiratory cough efforts after the administration of each drug. A significant reduction in inspiratory cough efforts occurred after Levo administration. Both drugs prolonged several cough temporal characteristics (prolongations of inspiratory phase, inspiratory-expiratory transition, total cough diaphragm activity, and total cough cycle duration), but differentially. Levo also significantly lengthened the expiratory phase of the cough. 3APPi induced a shortening of the overlap between diaphragm and abdominal activity and cough abdominal electromyographic activity.

Our data show that peripherally acting antitussive drugs significantly affect cough temporal features, which differs from the actions of centrally acting antitussives.

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