

FACILITATION OF THE COUGH RESPONSE DURING RHINITIS: THE ROLE OF THE FIRST AFFERENT NEURON

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Background: The idea of this study aroused from the paper published in *Respir Physiol Neurobiol* (2004), where we have reported augmentation of the cough response due to intranasal administration of capsaicin, a strong stimulant of the nasal mucosal afferent nerve endings. The aim of the present study was to assess the role of the first afferent nasal neuron in the process of facilitation of the cough response in the animal model. **Material and methods:** 26 male TRIK strain guinea pigs were used in this study. All animals were anesthetized with urethane (1.1mg/kg, ip). The animals were placed in the supine position on a heated operating pad and body temperature was maintained at 37-38°C. All animals were tracheotomized and the larynx was disconnected from the proximal part of the trachea, although the innervations of these structures were preserved. Cough induced by mechanical stimulation of the tracheobronchial mucosa was elicited three times: in the control condition, immediately after intranasal capsaicin challenge, and after intranasal capsaicin again prior local intranasal administration of Mesocain. During the intranasal Mesocain instillation, the animals were placed in the head down position and nasal cavity was filled with the anesthetic solution via a thin plastic catheter introduced into the nasopharynx through a small opening in the lateral laryngeal wall. This procedure was performed in 18 animals, in 8 animals the cough response was induced also three times, and as they were free of any intranasal manipulations, they were taken as controls for the stability and reproducibility of the tracheobronchial cough during urethane anesthesia. **Results:** We found that the intensity of tracheobronchial cough was significantly enhanced due to intranasal capsaicin challenge; the effect was abolished by a local intranasal pretreatment with Mesocain. The intensity of the cough attack was 21.95 ± 2.52 kPa vs. 37.65 ± 5.12 kPa vs. 22.89 ± 3.03 kPa, $p=0.007$ and the number of coughs in one attack was 2 (1-4) vs. 3.5 (2-7) vs. 2 (1-4), $p=0.001$. **Conclusion:** Facilitation of the cough response due to intranasal administration of capsaicin is of neuronal origin, howbeit facilitation of the cough during rhinitis, that is complex pathological process could involve also other mechanisms.