

DEEP NASAL INSPIRATIONS INCREASE THE COUGH THRESHOLD IN CHILDREN WITH MILD ASTHMA

**R. Pecova¹, T. Michnova², J. Fabry², T. Zatko¹, M. Neuschlova¹, P. Klco¹, J. Hanacek¹,
M. Tatar¹, and Z. Tomori³,**

¹Dept. of Pathophysiology, Comenius University in Bratislava,
Jessenius Faculty of Medicine, Martin,

²Srobar's Institute of Pediatric Tuberculosis and Respiratory Diseases, Dolny Smokovec,

³Dept. of Physiology and Sleep laboratory, Faculty of Medicine, University PJ Safarik,
Kosice, Slovakia

Introduction: Asthma is a chronic inflammatory disease characterized by bronchospasms accompanied with frequent coughing, the pathogenesis of which is not clear. In healthy adults deep inspirations (DIs) provide a protective effect against bronchoconstriction triggered by metacholin inhalation, which correlates with the number of accompanying cough efforts [1]. In adult asthmatics DIs have some spasmolytic effect, which decreases with age and severity of the disease [2].

The aim was to study the effect of deep nasal inspirations representing the voluntary equivalent of the sniff-like aspiration reflex [3] on the capsaicin-induced cough in children with mild asthma.

Methods: The cough reflex sensitivity to capsaicin (SIGMA) was determined using a compressed air-driven nebuliser (KoKo DigiDoser; nSpire health Inc, Louisville, CO, USA) in 21 children (8 girls and 13 boys of median age 13.3 yr) suffering from mild asthma (FEV1~80%). The effect of 5 previous DIs through the nose was examined on the elicibility of two and five or more cough efforts (C2 and C5).

Results: Under control conditions concentration of 20.86 (14.58-29.8) $\mu\text{mol/l}$ of capsaicin provoked two cough efforts (C2). After 5 DIs similar reaction required significantly higher concentrations of capsaicin: 29.02 (18.88-44.6) $\mu\text{mol/l}$; $P=0.016$. Five or more cough efforts (C5) were not significantly changed after previous DIs 161.49 (77.31-337.33) $\mu\text{mol/l}$ and without DIs 141.52 (68.77-291); $P=0.54$.

Conclusion: Series of 5 deep inspirations decreases the cough reflex sensitivity to evoke two efforts (C2) in children with mild asthma. This series of 5 DIs decreases the sensitivity of cough reflex provoked by capsaicin in children with mild asthma. The inhibitory effect of similar DIs disappeared after repeated applications of increasing doses of capsaicin, aiming to evoke 5 or more cough efforts, suggesting reflex character of protective effect of DIs.

This study was supported by a Grant of Ministry of Health of Slovak Republic 2007/50-UK-14.

References:

- 1) Ohkura N et al: Bronchodilator effect of deep inspirations... Cough 2009,5:1-8.
- 2) Scichilone N et al: The bronchodilatory effect...Respir Med 2004,98:838-840.
- 3) Tomori Z et al: Distinct generators for aspiration...J Physiol Pharmacol 2010,61:5-12.