

BIOLOGICAL EFFECTS OF POLYPHENOLS DURING EXPERIMENTAL ALLERGIC ASTHMA

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Background: There is an increased interest in natural products as sources of new drugs in the field of respirology over the last years. Many plant polyphenols have been shown their pharmacodynamic effects in the airways. Objectives: The aim of our experiment was to study changes in defence reflexes of the airways during experimental allergic asthma after single dose and long-term administration of polyphenols. This research was directed at their potential bronchodilatory and antiinflammatory effects. Methods: Our experiment was realized 21 days after the sensitization of guinea pigs with ovalbumin suspension. There were analysed changes in the reactivity of airways using the whole body plethysmography after single dose and long-term administration of polyphenols (Provinol, Flavin7, quercetin and resveratrol) during in vivo conditions. After single dose and long-term administration of polyphenols during in vitro conditions changes in the reactivity of the tracheal smooth muscle dipped into the organ bath with Krebs-Henseleit solution as the reaction on cumulative doses of bronchoconstrictor mediators histamine and acetylcholine were also monitored. Simultaneously there were measured levels of inflammatory cytokines IL-4 and IL-5 in bronchoalveolar lavage after chronic therapy with polyphenols in order to confirm their antiinflammatory effects. These effects were verified using histological analysis of the trachea and lung tissues directed at eosinophilic infiltration in the airways. Results: Provinol, Flavin7, quercetin and resveratrol caused significant acute bronchodilation. But only Provinol and Flavin7 reduced bronchial hyperreactivity after long-term oral administration and confirmed significant antiinflammatory effects in the airways. Conclusion: Polyphenolic compounds appears to be more effective in the antiinflammatory and bronchodilatory effects of the airways than their separate components.

Key words: polyphenols, hyperreactivity of the airways, allergic inflammation