The efficiency of flavonols in the setting of experimentally induced allergic asthma

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Objective: Our objective in this study was to evaluate and compare the therapeutic potency (bronchodilation, action on ciliary beat frequency, anti-inflammatory, anti-remodelling effect) of a different flavonol derivates: quercetin, fisetin and morin in the setting of experimentally induced allergic asthma.

Methods: Using an experimental model of allergic asthma, we evaluated the anti-asthmatic potential of flavonols either after acute or long-term (21 days) treatment of ovalbumin-sensitized guinea pigs. In light of this fact, we measured the following parameters: in vivo changes in specific airways resistance; ciliary beat frequency was estimated using a high-speed video camera; the levels of Th2 cytokines in bronchoalveolar lavage fluid and TGF-apha-1 in lung homogenate were determined using multiple analysis.

Results: The data showed that only acute administration of fisetin resulted in significant bronchodilation. The experimental results were indicative of significant bronchodilatory, anti-inflammatory, anti-remodelling effects exerted by quercetin chronic therapy. The data demonstrate that long-term morin administration resulted in bronchodilator effect like that of long-acting β2-agonists, an anti-inflammatory effect like that of corticosteroid, budesonide. Although a significant increase ciliary beat frequency was noticed in ovalbumin-sensitized guinea pigs, neither morin nor quercetin influence ciliary beat frequency.

Conclusions: In summary, flavonol derivates morin, fisetin and quercetin represent very rational targets for additional studies as potential substance for control as well as prevention of asthma inflammation and symptoms.

Keywords: Flavonols; Induced allergic asthma