Suppressive effects of 3-O-methylquercetin on ovalbumin-induced airway hyperresponsiveness

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摘要

Abstract

Rhamnus nakaharai Hayata(Rhamnaceae) has been used as a folk medicine in Taiwan for treating constipation, inflammation,tumors, and asthma.3-O-Methylquercetin(3-MQ), a main constituent of the plant, has been reported to inhibit total cAMP and cGMP-phosphodiesterase(PDE) of guinea pig trachealis at low concentration.3-MQ has been also reported to more selectively inhibit PDE3 than PDE4 with a low km value. Therefore we were interested in investigating its suppressive effects on ovalbumin(OVA)-induced airway hyperresponsiveness in vivo and in vivo.3-MQ(3-30umol/kg,i.p.)significantly suppressed the enhanced pause(penh)value induced by aerosolized methacholine(50mg/mL)in sensitized mice after secondary allergen challenge.3-MQ(3-30umol/kg,i.p.)also significantly suppressed total inflammatory cells,macrophages, neutrophils,and eosinophils, but not lymphocytes.In addition,3-MQ(3umol/kg,i.p.)significantly decreased the secretion of TNF- ,and at the highest dose(30umole/kg,i.p.)even decreased the secretions of IL-4,IL-5,and TNF-.3-MQ(1-10uM)as well as Ro20-1724(3-30uM),a selective PDE4 inhibitor,significantly attenuated OVA(100ug/mL)-induced contractions.3-MQ(30uM)as well as milrinone(1-10uM),a selective PDE3 inhibitor,significantly enhanced baseline contractions in isolated guinea pig left and right atria.However,neither 3-MQ nor milrinone significantly affected baseline beating rate in the right atria.3-MQ(3-30umol/kg,i.p.)did not significantly affect systolic pressure in conscious mice.In conclusion,3-MQ has both anti-inflammatory and bronchodilating effects,and has the potential for use in the treatment of asthma at a dose without affecting blood pressure.