Quercetin 3-O-methyl peracetate 在活體及離體抗氣喘的作用機轉

Mechanisms of anti-asthmatic action of quercetin 3-O-methyl peracetate in vivo and in vitro

中文摘要

英文摘要

In our previous study, we found quercetin 3?-O-methyl peracetate (QMPA) more than 3-MQ effectively inhibited PDE1~5. QMPA whether possesses anti-asthmatic effect is the aim of this investigation.

Female BALB/c mice were sensitized by an intraperitoneal injection of ovalbumin (OVA), then challenged via the airway by ultrasonic nebulization of 1% OVA two times. After secondary challenge, the airway hyperresponsiveness was measured in unrestrained animals, nebulized with methacholine (MCh, 5~50 mg/ml), by barometric plethysmography using a whole-body plethysmograph. In the present results, QMPA (3~10 μmol/kg, i.p.) dose-dependently attenuated the enhanced pause (Penh) value induced by MCh (25~50 mg/ml). Furthermore, QMPA (10 μmol/kg, i.p.) also significantly inhibited MCh (12.5 mg/ml)-induced Penh value. The Penh values of mice administered QMPA (3~10 μmol/kg, i.p.) did not significantly differ from those of non-sensitized mice

QMPA (3~10 μmol/kg, i.p.) also significantly inhibited total inflammatory cells, neutrophils, eosinophils, lymphocytes and macrophages, in BALF after determination of Penh values. It also significantly attenuated the release of IL-2, IL-4, IFN-γ and TNF-α. It at 10 μmol/kg furthermore significantly inhibited the release of IL-5.

QMPA (3~10 μM) significantly inhibited cumulative OVA (10~100 μg/ml)- induced contractions of isolated sensitized guinea pig trachea.

By Lineweaver-Burk analysis, QMPA (1~10 μM) competitively inhibited PDE3 and PDE4 activities. In conclusion, QMPA selectively and competitively inhibited PDE3 and PDE4 activities. At doses of 3~10 μmol/kg (i.p.), it possessed more anti-inflammatory and bronchodilating effects than 3-MQ. Therefore it may have more potential in the treatment of asthma.