

Title: “Polydatin protects against ovalbumin-induced bronchial asthma in rats; involvement of urocortin and surfactant-D expression”

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Abstract:

Context: Prevalence of bronchial asthma massively increases worldwide, while the frequent therapies are still not sufficient. Polydatin, a naturally occurring glycoside, was known as to have anti-inflammatory and anti-oxidant effects. Objective: The current study aimed to investigate the possible protective effect of polydatin against experimental bronchial asthma in rats. Material and methods: Bronchial asthma was induced by ovalbumin (OVA) sensitization and challenge. Rats were randomly allocated into five groups; Group I (normal control group); Group II (asthma control group) received OVA; Group III (reference standard treatment group) received dexamethasone (1 mg/kg/day); Group IV (treatment group) received polydatin (200/mg/kg); and Group V (polydatin control group). The inflammatory biomarkers interleukin-4 (IL-4), IL-5, IL-13, tumor necrosis factor alpha, interferon-gamma and absolute eosinophil count in bronchoalveolar lavage fluid (BALF), as well as serum immunoglobulin E were assessed, coupled with the oxido-nitrate stress biomarkers malondialdehyde and glutathione reduced levels and superoxide dismutase activity in the lung tissue, besides inducible nitric oxide synthase level in BALF. Western blot analysis of surfactant-D and immunohistochemical assay of urocortin (UCN) expression in the lung was performed. Results: Polydatin significantly reduced the inflammatory mediators and restored the normal values of oxidative and nitrosative stress biomarkers. It also significantly reduced the expression of surfactant-D and UCN as compared to asthma control. The histopathological study strongly augmented the biochemical results. Discussion and conclusions: Polydatin may be a promising protective agent against experimentally induced bronchial asthma. Modulation of SP-D and UCN expressions seems to mediate such protective effects.

Keywords:

Bronchial asthma; urocortin; surfactant-D; ovalbumin; polydatin; dexamethasone.