15-Deoxy-prostaglandin J2 anti-inflammation in a rat model of chronic obstructive pulmonary disease and human bronchial epithelial cells via Nrf2 activation

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ABSTRACT. Nuclear factor-erythroid 2-related factor 2 (Nrf2) is a transcription factor that regulates antioxidant and anti-inflammatory genes, and it plays a crucial role in the pathogenesis of chronic obstructive pulmonary disease (COPD). Moreover, 15-deoxy-delta12,14-prostaglandin J2 (15d-PGJ2) plays a protective role against oxidative stress and inflammation both in vivo and in vitro. In a previous study, we found that 15d-PGJ2 increased the expression of Nrf2 in a COPD rat model. This study aims to elucidate the role of 15d-PGJ2 in COPD pathogenesis and the relationship between Nrf2 and human bronchial epithelial (HBE) cells. Normal HBE (HBE) cells were cultured. Following cigarette smoke extract (CSE) stimulation, pre-incubation with or without small interfering RNA
(siRNA) Nrf2, and stimulation with or without 15d-PGJ2, the expression levels of Nrf2, NF-κBp65, and IL-8 were detected by reverse transcription-polymerase chain reaction and western blot, respectively. The expression of NF-κBp65 and IL-8 in CSE-stimulated normal HBE cells was inhibited by 15d-PGJ2 at both the mRNA level and the protein level. Moreover, the expression of Nrf2 in normal HBE cells was improved by 15d-PGJ2 at both the mRNA level and the protein level. However, the inhibitory or improving effects of 15d-PGJ2 were disengaged by siRNA Nrf2 at both the mRNA level and the protein level. 15d-PGJ2 possesses anti-inflammatory properties in the pathogenesis of COPD, and HBE cells stimulated by CSE via Nrf2 activation.

**Key words:** Chronic obstructive pulmonary disease; Nrf2; NF-κB; 15-Deoxy-delta12,14-prostaglandin J2