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Title: Quercetin attenuates inflammation in cigarette smoke stimulated airway epithelial cells: Possible involvement of autophagy

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Body: Objectives: Cigarette smoke is known to cause inflammatory response in human bronchial epithelial cells. In this study, we investigated the effects of quercetin, a flavonoid abundant in fruits and vegetables, on cigarette smoke extract (CSE)-induced inflammation in human bronchial epithelial cells (HBEC) and roles of autophagy in this process. Methods: HBEC were exposed to CSE (4%) for 24h, with or without pretreatment of quercetin (10 μ M or 20 μ M). The autophagy activation marker, LC3 II protein, was detected with western blotting. Autophagy was inhibited by 3-methyladenine (3-MA) (2.5mM). TNF- α and IL-1 β levels in the supernatant were determined by ELISA. Results: Exposure of HBEC to CSE significantly increased TNF- α and IL-1 β expression and this upregulation was significantly attenuated by quercetin ($p < 0.05$). Meanwhile, the pre-treatment of quercetin decreased the ratio of LC3 II to LC3 I, which was increased by CSE ($p < 0.05$). Inhibiting autophagy by 3-MA also decreased TNF- α and IL-1 β levels to a similar level as that of quercetin. Conclusion: These results suggest that quercetin attenuated inflammation induced by cigarette smoke. The anti-inflammatory effect might act through modulating autophagy.