

Abstract

Objective: Mitochondria, as an intracellular organelle, in addition to playing a key role in the production of energy needed by cells, have been shown to play a role in the pathogenesis of various diseases. The aim of the present study was to investigate the effects of crocin on the expression level of genes involved in the mitophagy pathway including Drp1, Mnf2, Pcg1 α and Nrf1 in the lung tissue of mice sensitized with ovalbumin.

Method and Materials: In this study, 40 male BALB/C mice were included in the study and divided into 4 groups, including the control group, the group sensitized with ovalbumin, the group sensitized with ovalbumin combined with crocin 30 mg/kg, and the group sensitized with ovalbumin combined with crocin 60 mg/kg. Sensitization with ovalbumin was done by injecting ovalbumin and aluminum hydroxide as well as inhalation of ovalbumin aerosol. In the interventional groups, crocin was injected (i.p.) at 5 days in the end of asthmatic period. The lung tissue of the mice was used to evaluate the expression of the studied genes through real-time PCR (Drp1, Mnf2, Pcg1 α and Nrf1).

Results: The results of the study revealed that the expression levels of Drp1, Nrf1 and Pcg1 α genes in the lung tissue of mice sensitized with ovalbumin increased significantly compared to the control group, while the expression of Mnf2 mRNA decreased. The intervention of the crocin, especially with a high concentration, significantly exerted protective effects on the expression changes of the above genes.

Conclusion: The results showed that the anti-inflammatory and antioxidant effects reported for crocin in the animal model of asthma were probably done through the modulation of the factors involved in the mitochondrial fission and fusion pathways, which requires additional studies.

Keywords: Asthma, crocin, mitochondria, mitophagy