Quercetin-loaded microcapsules ameliorate experimental colitis in mice by anti-inflammatory and antioxidant mechanisms.


Departamento de Ciências Patológicas-Centro de Ciências Biológicas, Universidade Estadual de Londrina, Londrina, Brazil

Abstract

Quercetin (1) is an anti-inflammatory and antioxidant flavonoid. However, the oral administration of 1 did not lead to beneficial effects in experimental animal colitis models, which involve cytokines and oxidative stress. A possible explanation is that the absorption profile of 1 prevents its activity. Therefore, it was reasoned that the controlled release of 1 would improve its therapeutic effect. Thus, the therapeutic effect and mechanisms of 1-loaded microcapsules in acetic acid-induced colitis in mice were evaluated. Microcapsules were prepared using pectin/casein polymer and 1. The oral administration of 1-loaded microcapsules decreased neutrophil recruitment, attenuated histological alterations, and reduced macroscopical damage, edema, and IL-1β and IL-33 production in the colon samples. Microcapsules loaded with 1 also prevented the reduction of anti-inflammatory cytokine IL-10 and the antioxidant capacity of the colon. These preclinical data indicate that pectin/casein polymer microcapsules loaded with 1 improved the anti-inflammatory and antioxidant effects of 1 compared to the nonencapsulated drug. Therefore, quercetin seems to be a promising active molecule in inflammatory bowel disease if provided with adequate controlled release.

PMID: 23347547 [PubMed - indexed for MEDLINE]