

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Pharmacological Reports

journal homepage: www.elsevier.com/locate/pharep

Original article

Fisetin and telmisartan each alone or in low-dose combination alleviate OVA-induced food allergy in mice

Reem Elkholy^a, Mohamed Balaha^{b,a,*}, Noha El-Anwar^c, Samah Kandeel^d, Sabiha Hedya^a, Mohamed-Nabih Abd-El Rahman^{a,e}^a Pharmacology Department, Faculty of Medicine, Tanta University, Tanta, Egypt^b Department of Clinical Pharmacy, College of Pharmacy, Prince Sattam Bin Abdulaziz University, Saudi Arabia^c Pathology Department, Faculty of Medicine, Tanta University, Tanta, Egypt^d Histology Department, Faculty of Medicine, Tanta University, Tanta, Egypt^e Pharmacology Department, Faculty of Medicine, Bisha University, Saudi Arabia

ARTICLE INFO

Article history:

Received 26 April 2018

Received in revised form 17 October 2018

Accepted 20 December 2018

Available online 21 December 2018

Keywords:

Fisetin

Telmisartan

OVA-food allergy

IL-4

IFN- γ

ABSTRACT

Background: Food allergy (FA) is a worldwide health problem, affecting nearly 10% of all populations, with no prophylactic options or regulatory treatment available until now. Fisetin, a biologically active flavonoid, and telmisartan, the highly selective competitive AT1 receptor antagonist, recently exhibited potent anti-inflammatory and immunomodulatory activities. In the present study, we have evaluated the possible anti-inflammatory and immunomodulatory activities of fisetin and telmisartan each alone or in low-dose combination in a mouse model of FA.

Methods: For induction of FA, eight-week-old BALB/c mice, sensitized by two *ip* injection of 50 μ g ovalbumin (OVA) and 1 mg alum at day 0 and 7. Then, each mouse challenged with 10 mg OVA at days 14, 16, 18, and 21. On the 28th day, the fifth challenge carried out by oral administration of 50 mg OVA. Either fisetin (1 or 3 mg/kg/d), telmisartan (1 or 3 mg/kg/d) or a combination of fisetin 1 mg/kg/d and telmisartan 1 mg/kg/d received orally from the 13th day till 28th day. In challenge days, the treatments received one-hour before the challenge.

Results: Our data showed that fisetin and telmisartan each alone or in low-dose combination attenuated the anaphylactic manifestation, decreased blood eosinophilic count, serum OVA-specific IgE, and IL-4 levels, the intestinal total and degranulated mast cells count, and CD4⁺ immunohistochemical expression. Furthermore, they enhanced the serum IFN- γ level and abrogated the intestinal histopathological changes induced by OVA in mice.

Conclusion: Either fisetin, telmisartan or their low-dose combination could be promising in the management of FA.

© 2018 Institute of Pharmacology, Polish Academy of Sciences. Published by Elsevier B.V. All rights reserved.