

Dear Editor

### A Case of Food-dependent Exercise-induced Anaphylaxis after Grapefruit Ingestion

Food-dependent exercise-induced anaphylaxis (FDEIA) is characterized by anaphylactic symptoms after eating certain foods, followed by exercise. It was first described in 1979 in a patient who showed anaphylaxis after shellfish ingestion and exercise.<sup>1</sup> Here, we would like to add grapefruit as an instigating food of FDEIA.

A 17-year-old female high school student experienced anaphylactic symptoms, which were composed of dyspnea, hives, and Quincke's edema during physical exercise (sprint training) after lunch. She had eaten lettuce, cabbage, egg, fish cake of cod, rice, cucumber, chicken, ume apricot, and grapefruit for lunch. She had a history of atopic dermatitis and egg allergy during childhood. Her father had solar dermatitis and her mother had cedar-pollinosis. On admission, three months after the initial anaphylaxis, no significant findings were found in the physical examination. She did not have eosinophilia, but had high titers of serum IgE (1539 U/ml). Skin tests revealed positive reactions to cabbage, cod, and grapefruit, but negative reactions to almond, peanut and wheat. Open-labeled oral challenge tests, which were performed using 60 g wet weight of cabbage, cod, or grapefruit, failed to induce any allergic reactions. Ingestion of these foods, followed by exercise (100 kcal on a stationary bicycle), also did not induce any reactions. We administered 500 mg aspirin *per os*, followed by both food ingestion and exercise.<sup>2,3</sup> Only grapefruit induced anaphylactic reactions such as dyspnea, angioedema of the eyelids, and hypoten-

sion, especially in diastolic blood pressure. Her blood pressure decreased from 141/86 mmHg to 105/25 mmHg before injection of epinephrine. However, aspirin loading followed by exercise did not induce any allergic reactions. She was told to avoid grapefruit and has experienced no further reactions.

Shellfish is the most common trigger allergen in the United States,<sup>4</sup> while wheat is the major contributing factor to FDEIA in Japan.<sup>5</sup> Strawberry and peach are the fruits most implicated as causes of FDEIA.<sup>4</sup> This is the first report of FDEIA induced by grapefruit. We would like to add grapefruit to the etiopathogenetic agents in FDEIA.

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