INTRODUCTION

Ginseng has long been used in the Far East as a herbal medicine. The most widely used ginseng is Panax ginseng (Korean ginseng). In Korea, ginseng products are commercially available in various formats such as root, powder, tablet, capsule, liquid extract, and tea. Ginseng is one of the most widely used medicinal plants; however, there have been two case reports of Korean ginseng-induced allergic reactions. Both cases were inhalation-induced respiratory allergies developed in occupational settings. Here, we present the first case of an anaphylactic reaction developed after oral intake of ginseng, confirmed by an open oral challenge, skin prick test (SPT), and basophil activation test (BAT).

CASE REPORT

A 44-year-old man developed anaphylaxis after an oral intake of fresh ginseng. He complained of rhinorrhea and nasal stiffness, followed by respiratory difficulty with wheeze and abdominal pain 10 minutes after oral intake of fresh ginseng. He had suffered from episodes of allergic rhinitis during the spring season for several years. Upon presentation, a physical examination, chest radiograph, and routine laboratory tests were unremarkable. Total serum IgE level was 41 IU/mL. The SPT results showed strong positive responses to alder, birch pollens, and ginseng extracts (1:500 w/v). The methacholine bronchial challenge test revealed a positive result at PC20 of 5.83 mg/mL. The open oral challenge was performed using 50 g of fresh ginseng and showed immediate onset of facial flushing, cough, respiratory difficulty with wheeze, and abdominal pain combined with a significant decrease in FEV1 levels (54% from the baseline). Serum-specific IgE and IgG4 antibodies were not detectable by enzyme-linked immunosorbent assay. BAT showed a remarkable increase in the expression of CD203c and CD63 with the addition of ginseng extract in a dose-dependent manner, while no changes were noted in the controls. In conclusion, oral intake of Korean ginseng could induce anaphylaxis, which is mediated by non-IgE-dependent direct activation of basophil/mast cells.

Key Words: Anaphylaxis; basophil; flow cytometry, Panax
We believe this is the first reported case of ginseng-induced anaphylaxis, wherein sensitisation and induction was via the oral route in a non-occupational setting; both the previously reported cases of occupational asthma were induced by the inhalation of ginseng dust in the workplace.\(^2\)\(^3\) Although these two cases were confirmed by specific bronchial allergen tests, only one had high levels of serum-specific IgE antibodies,\(^2\) suggesting the involvement of a non-IgE-mediated response in its pathogenic mechanism.\(^2\) In the present study, serum-specific IgE was not detected by ELISA, although the patient had a positive SPT result. He had a high level of serum-specific IgG1 against ginseng, which may indicate that exposure to ginseng did not have a pathogenic role. The results of BAT showed a significant dose-dependent increase in the expression of the basophil activation markers, namely, CD203c and CD63, due to exposure to ginseng extracts. BAT, using these two markers is considered to be a reliable and useful tool for the diagnosis of basophil involvement in allergic diseases,\(^5\)\(^6\) suggesting that oral exposure to ginseng could directly activate basophil/mast cells, and induce anaphylaxis in the sensitised subjects. Another possible explanation for the mechanism is the cross reactivity between ginseng and tree pollen. However, we believe the possibility of this to be low, considering our wealth of experience of specific IgE detection.

In conclusion, we report the first case of anaphylaxis induced by oral exposure to Korean ginseng, which may be mediated by non-IgE dependent direct activation of basophil/mast cells. Further studies are needed to investigate other immunological and non-immunological mechanisms underlying this ginseng-induced anaphylaxis in a larger cohort of individuals with ginseng allergy.

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