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Letter to the Editor

Oral immunotherapy initiation for multi-nut allergy: A case report

Dear Editor

Oral immunotherapy (OIT) has been reported to be effective for food allergy in recent years,[1] but most studies on OIT have focused on a single antigen. Begin et al. first reported the use of OIT using peanuts and another allergen simultaneously, which was feasible and relatively safe.[2] The purpose of this study was to evaluate the safety and efficacy of multi-nut OIT initiation for a patient with multi-nut allergy.

We enrolled a 22-year-old man who had peanut, cashew nut, and walnut allergies. He experienced face swelling after eating peanuts at the age of one. He and his mother tried to eliminate peanuts and other nuts completely; however, he occasionally ingested nuts accidentally. He had conjunctival erythema, lip swelling, and a cough after peanut ingestion at the age of 17 and generalized flushing, vomiting, and breathing difficulty after cashew nut ingestion at the age of 21.

He was initially checked for food-specific IgE (sIgE) and component-resolved diagnostics (CRD) using the ImmunoCAP assay system (Thermo Fisher Scientific, Uppsala, Sweden). Food sIgE (kU/l) was 11.6 for peanut, 3.87 for cashew nut, 6.08 for walnut, 5.92 for pistachio, 2.22 for macadamia nut, and <0.10 for almond and hazel nuts. CRD was 0.24 for Ara h 1, 13.6 for Ara h 2, 7.34 for Ana o 3, <0.10 for Ara h 3, 8, and 9, Jug r 1 and 3, Bet v 1 and 2, Pru p 3, and Gly m 4, 5, and 6. Open oral food challenge of 0.5 g of peanut or 3.0 g of each nut was conducted before OIT. Peanut was administered at 60-min intervals as follows: 1/4 and 3/4. Each nut was administered at 30-min intervals as follows: 1/8, 3/8, and 4/8. He reacted to 0.5 g of peanut, 1.1 g of cashew nut, and 3.0 g of walnut. He tolerated pistachio, macadamia nut, almond, and hazel nut.

He received OIT using peanut, cashew nut, and walnut simultaneously. From the day of admission, he took loratadine (10 mg) before nut intake. On the day of admission, a double-blind, placebo-controlled food challenge (DBPCFC) was performed. The challenge food was made by mixing equal amounts of the three nuts. From the second to fourth day in the hospital, he ingested mixed nut powder, which contained equal amounts of the three nuts, twice a day. During his stay, we adjusted the amount so that he would not experience severe symptoms at home. After discharge, he took the same amount once a day after taking loratadine. We investigated the severity of symptoms for safety and changes in symptom occurrence and food sIgE for efficacy. This study was approved by the Sagamihara National Hospital Ethics Committee and was conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from him.

During DBPCFC, he experienced an itchy throat and moderate abdominal pain at 1.5 g of total nut intake (0.5 g of each nut) without any treatment. In the morning of the second hospital day, he experienced an itchy throat, generalized erythema, persistent cough, and moderate abdominal pain at 1.5 g and was treated with an oral antihistamine and inhaled β2 agonist. After the amount was decreased to 0.5 g of total nuts, he only experienced an itchy throat and mild abdominal pain. He didn't need any treatment except for oral antihistamine in the morning of the third hospital day.

After discharge, he continued to take 0.5 g of total nuts (0.17 g of each nut). He experienced symptoms of itchy throat, mild abdominal pain, and diarrhea once at home. He took oral antihistamine as treatment for mild abdominal pain and diarrhea only twice in week 1. Any symptoms and each symptom decreased from the initiation of the study to 8 months (Fig. 1).

Peanut, cashew nut, and walnut sIgE temporarily increased at 1 month, and decreased at 3 and 6 months. Ara h 1–3 and Ana o 3 sIgE changed in the same manner (Fig. 2). Ara h 8 and 9, and Jug r 1 and 3 sIgE from pre-OIT to 6 months were <0.10 kU/l.

Less than 25%–50% of patients with peanut allergies have tree nut allergy.[3] In general, patients with peanut and other nut allergies are not unusual. If patients with multi-nut allergies tolerate a single nut by OIT to a single allergen, they have to avoid the other nuts.

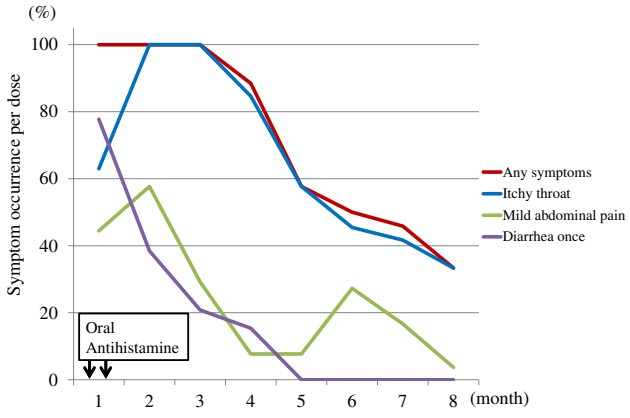

Fig. 1. Symptom occurrence of multi-nut oral immunotherapy at home. Total dose was 202 doses. Total number of symptoms was 146 times (72.2%) for any symptoms, 133 times (65.8%) for itchy throat, 49 times (24.3%) for mild abdominal pain, and 40 times (19.8%) for diarrhea once.

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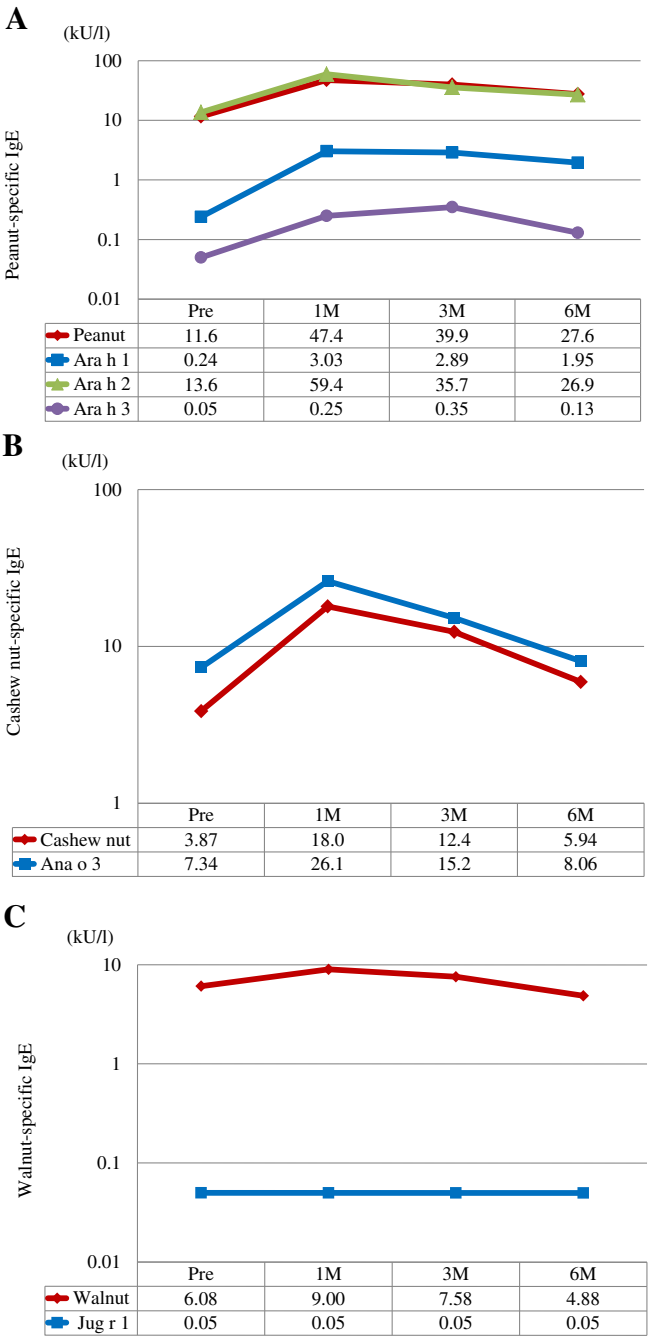

Fig. 2. Changes in food-specific IgE and component-specific IgE during multi-nut oral immunotherapy. Serum samples were collected before starting multi-nut oral immunotherapy (pre) and at 1 month (1 M), 3 months (3 M), and 6 months (6 M) after starting immunotherapy. A, Peanut. B, Cashew nut. C, Walnut.

Therefore, in this study we tried multi-nut OIT for a patient with a multi-nut allergy.

All symptoms, except for the first two moderate symptoms, were mild, which demonstrated that he could start multi-nut OIT safely. Our patient's symptom occurrence during 8 months was 72.2%. Begin et al. reported that symptom occurrence was a median of 2.9% (range 0.1–59.0%).[2] Other studies showed that Ara h 2 sIgE values correlated with symptom severity by peanut ingestion.[4,5] Begin's patients did not check Ara h 2 sIgE; however, our patient had elevation of Ara h 2 sIgE and Ana o 3 sIgE. Sensitization of Ara h 2 and Ana o 3 may affect the difference in symptom occurrence between our patient and Begin's patients. Furthermore, the decreasing trend of our patient's symptom occurrence suggests that multi-nut OIT may be effective.

Food sIgE in our patient was temporarily increased at 1 month, and decreased at 3 and 6 months. Jones et al. reported that peanut sIgE in patients receiving peanut OIT temporarily increases and then decreases.[6] Bird et al. reported that peanut OIT does not decrease cashew nut and walnut sIgE.[7] Changes in our patient's food sIgE suggest that although our patient's maintenance dose was small, each nut ingestion affected each nut sIgE. Ara h 1–3 sIgE but not Ara h 8 and 9 in our patient changed in a similar manner to those in Vickergy's study.[8]

Multi-nut OIT initiation for multi-nut allergy may be safe and may contribute to decrease of symptom occurrence and food-specific IgE. We need to further investigate the mechanism by which our patient was able to tolerate nuts by multi-nut OIT.

Conflict of interest

The authors have no conflict of interest to declare.

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