
High Stimulation Index for Quail Egg Yolk After an Allergen-Specific Lymphocyte Stimulation Test in a Child With Quail Egg–Induced Food Protein–Induced Enterocolitis Syndrome

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Key words: Food protein-induced enterocolitis syndrome. Quail egg. Allergen-specific lymphocyte stimulation test.**Palabras clave:** Síndrome de enterocolitis inducida por proteínas de los alimentos. Huevos de codorniz. Test de estimulación linfocitaria alérgico específica.

Eggs are one of the most common causes of IgE-mediated food allergy in children worldwide. In a retrospective cohort study in the US, chicken egg was the fifth most commonly involved allergen in food protein–induced enterocolitis syndrome (FPIES) and was responsible for 11% of cases [1]. A patient with IgE-mediated chicken egg allergy usually avoids other types of bird egg owing to cross-reactivity between IgE antibodies and allergens [2]. However, the major antigens and cross-reactivity in bird egg–induced FPIES are not fully understood, and there are few reports of FPIES induced by quail egg in children who had no symptoms after ingesting chicken egg [3,4]. We report the results of a double blind, placebo-controlled food challenge (DBPCFC) and allergic in vitro testing in a 7-year-old Japanese girl with FPIES to quail egg but not to chicken egg.

The patient had a history of repetitive vomiting about 3-4 hours after eating heated quail egg when she was 4 and 7 years old. She had never experienced an allergic reaction after ingesting chicken egg and had had no other allergic diseases (eg, allergy to other foods, asthma, and atopic dermatitis). She had no family history of allergic disease.

The results of the prick-by-prick tests with raw yolk, raw egg white, boiled yolk, and boiled egg white were negative for both quail and chicken egg. The results of allergen-specific IgE testing were all under 0.10 kU_A/L, for chicken egg white, yolk, and ovomucoid (ImmunoCAP, ThermoFisher Scientific). After informed consent for a DBPCFC was obtained, the patient ingested a pancake containing quail egg or a pancake containing chicken egg as a control. She vomited several times but had no other symptoms 3 hours after eating the pancake containing quail egg. Similarly, she had no symptoms after eating the pancake containing the same quantity of chicken egg. Although this result failed to meet the current diagnostic criteria for FPIES [5], we avoided increasing the amount of quail egg owing to the possibility of aggravating the

Table. Stimulation Index in the Patient's Allergen-Specific Lymphocyte Stimulation Test^a

| | | Stimulation Index, % |
|---------|-------|----------------------|
| Quail | Yolk | 364 |
| | White | 289 |
| Chicken | Yolk | 187 |
| | White | 195 |

^aThe cut-off value of this test was 180%.

mild symptoms already present. Based on these results, we diagnosed the patient's condition as FPIES due to quail egg.

An allergen-specific lymphocyte stimulation test (ALST) (SRL) using raw egg white and yolk from quail and chicken egg separately showed that the stimulation index of egg white and yolk was higher for quail egg than for chicken egg and that the stimulation index of quail egg yolk was higher than that of the quail egg white (Table). Although we did not separate the yolk and white of quail egg for the DBPCFC, the results of the ALST indicated that quail egg yolk might be a major allergen in quail egg-induced FPIES.

Two cases of children with FPIES to quail egg but not to chicken egg were reported in Cyprus and Japan [3,4]. The patients were 3 and 6 years old, and their symptoms included repeated vomiting, pallor, and lethargy 1 to 3 hours after ingesting quail egg. Both children were able to ingest chicken egg without an allergic reaction. FPIES induced by chicken egg has been reported [6,7]. However, it is unknown whether those who have chicken egg-induced FPIES are able to eat quail egg without experiencing an allergic reaction.

Milk-specific ALST has been reported to be helpful for diagnosing neonatal and infantile FPIES [8]. Akashi and Sato [4] reported the utility of quail egg-specific ALST in a 6-year-old girl with FPIES to quail egg but not to chicken egg. The patient had a positive result for quail egg but a negative result for chicken egg after ALST [4]. In the present case, the results of the ALST showed that the stimulation index of quail egg yolk was higher than that of quail egg white or chicken egg, and that all the results exceeded the cut-off value, which was 180%. Although the ALST is theoretically useful for diagnosing FPIES, its actual utility in children and adults remains controversial [6]. In the case we report, ALST was useful for diagnosing FPIES due to quail egg. However, the patient was able to ingest chicken egg without an allergic reaction despite a slightly positive result on ALST for chicken egg yolk and egg white. Further studies are needed to confirm the utility of ALST and to set an adequate cut-off value for diagnosing bird egg-induced FPIES.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

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