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Double-blind, placebo-controlled corn challenge resulting in anaphylaxis

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To the Editor:

There are few reports of documented corn allergy, particularly corn-induced anaphylaxis. The first report of anaphylaxis to corn in 1984¹ described a corn-induced reaction in a child on reintroduction of sweet corn after an elimination diet to treat eczema. There are 3 reports of anaphylaxis attributed to cornstarch in surgical glove powder.^{2,4} Most recently, Pauls and Cross⁵ reported food-dependent exercise-induced anaphylaxis to corn in an adult. Although these studies suggest corn-induced anaphylaxis exists, only the last was observed in a controlled setting. This study reports the first patient with classic anaphylaxis to corn observed in a double-blind, placebo-controlled food challenge.

A 44-year-old woman was referred for evaluation of corn allergy. Her first reaction to corn (1982) consisted of an oral tingling sensation after licking corn meal from her fingers. The symptoms resolved without medical intervention. However, since 1994, with limited exposure she has had 4 reactions to corn requiring emergency department visits for pruritis, urticaria, vomiting, and diarrhea. The most recent reaction, 6 months previously, also involved difficulty breathing; subsequently, she avoids corn and corn products.

The patient experienced urticaria, vomiting, and diarrhea in response to pecans and peanuts and therefore carries injectable epinephrine. She received immunotherapy years ago for allergic rhinitis (now treated with nasal budesonide and fexofenadine). She had never had asthma, eczema, or adverse reactions to medications, latex, or insect stings. Her environmental history is unremarkable. She has smoked a half pack of cigarettes per day for 30 years and currently takes bupropion hydrochloride. Her siblings have allergic rhinitis. Her other medical problems include gastroesophageal reflux disease and hypercholesterolemia, treated with omeprazole and simvastatin, respectively. Antihistamines were discontinued 1 week before her evaluation. Except for enlarged, pale nasal turbinates, her physical examination findings were normal. Baseline peak flow measurements averaged 460 (L/min).

She came to the General Clinical Research Center for evaluation. The Tulane Committee on Use of Human Subjects approved the protocol, and informed consent was obtained from the patient. Skin prick testing revealed positive results for histamine (10 mm), cooked corn (10 mm), uncooked corn (35 mm), corn pollen (39 mm), peanut (28 mm), rice (20 mm), grass mix (20 mm), and dust mites (25 mm). Negative test responses occurred for PBS, lentil, challenge vehicle, wheat, milk, soy, shrimp, egg, oat, rye, ragweed, oak, cat, dog, and molds. We prepared the corn, placebo, and challenge vehicle extracts; the rest were from Greer.

The challenge consisted of 2 phases: corn flour (baked ground corn kernels) or placebo (baked ground lentils), where incremental amounts were given at 30-minute intervals. The 2 phases were separated by 2 hours. Neither the patient nor the physician knew the challenge sequence. The corn flour or placebo was mixed with applesauce, apple juice, peach puree, and sugar to mask the taste.

During the first phase the patient did not have subjective or objective reactions. After a 2-hour break, she performed the second phase of the challenge (corn flour), and a reaction occurred. After receiving the first dose of corn (2 g), she described feeling "fullness," but her vital signs and peak flow remained baseline. After the second dose of corn (8 g), she reported mild throat pruritis that resolved, but no objective changes were observed. Thirty minutes after the third corn dose (16 g), erythematous sclera, nasal congestion, and generalized urticaria developed. She was given diphenhydramine and observed. Fifteen minutes later, classic signs of anaphylaxis developed, including hypotension (systolic 99 mm Hg/diastolic 53 mm Hg), tachycardia (126 bpm), vomiting, and wheezing. Unfortunately, a tryptase level could not be documented. Treatment with epinephrine, oxygen, albuterol, methylprednisolone, and intravenous fluids commenced immediately. She was admitted to the General Clinical Research Center overnight for continued observation. By morning her symptoms had resolved, and her vital signs had returned to baseline for several hours. The subject was discharged in good condition and reported no ill effects thereafter. Telephone follow-up revealed that she remained well and had had no further problems.

This is the first case of anaphylaxis to corn documented with a double-blind, placebo-controlled food challenge. Neither the physician performing the challenge nor the test subject knew in which phase the patient received corn until the challenge was terminated.

This patient experienced anaphylaxis after a total of 26 g of corn flour (approximately equivalent to 6 corn chips). This study indicates that although corn allergy may be a rare event, when it occurs it can produce a severe reaction. Further studies are in progress to evaluate corn allergy.

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Immunologic response to administration of standardized dog allergen extract at differing doses

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