Severe Allergy to Chicken Meat

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ABSTRACT
Introduction: While allergic reactions to poultry products in the form of feathers and eggs are common, allergic reactions to chicken meat are rare. Despite the popularity of chicken in today’s healthy diet, severe reactions after ingesting chicken meat are rarely described. This report describes a patient who developed chicken meat anaphylaxis without experiencing allergy to eggs or feathers.

Methods: A carefully obtained history from a 41-year-old male suggested chicken meat as the cause of his symptoms. He developed abdominal cramping, generalized urticaria, and chest tightness after ingestion of chicken meat. Percutaneous allergy skin testing with commercial chicken and turkey extract and freshly cooked chicken utilizing the prick-prick test was performed.

Results: Skin testing was positive with all extracts of chicken and turkey in the patient, and negative in 4 healthy adult controls. Skin tests with feather and egg extract were negative.

Conclusion: This is the third report of severe allergy to chicken meat in the absence of egg allergy. Physicians should be aware of the presence of chicken allergy without concomitant feather or egg allergy, particularly in adults.

INTRODUCTION
Allergy to chicken proteins is usually in the form of egg allergy in children or bird feather hypersensitivity in adults. Despite the popularity of eating poultry in the United States, there are few published data concerning severe allergic reactions to chicken meat. In children with atopic dermatitis, the prevalence of chicken sensitivity by skin puncture test (SPT) was found to be 17%, yet the clinical relevance was lower, with 2% of SPT-positive individuals reacting in double-blind placebo-controlled food challenges. In a review of the literature, 8 patients exhibited IgE-mediated chicken meat allergy but all were asymptomatic with egg ingestion. Their symptoms ranged from labial pruritus, oral allergy syndrome, urticaria or angioedema, to asthma and anaphylaxis (2 patients).

In this report we describe a case of severe chicken meat allergy presenting in an adult with cutaneous, gastrointestinal, and respiratory symptoms after consumption of small amounts of chicken.

CASE REPORT
A 41-year-old male presented with complaints of abdominal cramping, nausea, and sweating after eating grilled chicken prepared at home. Within minutes he developed pruritus and urticaria distributed over his palms, abdomen, groin, and lower extremities. His symptoms progressed to chest tightness, prompting him to self-administer albuterol 2 puffs by metered dose inhaler and diphenhydramine 50 mg orally. His symptoms gradually resolved and he did not seek medical care. Prior to this episode he had experienced recurrent episodes of abdominal cramping and nausea 30 minutes after eating chicken on numerous occasions. These symptoms became more frequent and severe over the preceding several months. He frequently ate poultry in an effort to minimize ingestion of red meat as part of a low cholesterol diet. He reported nausea after eating turkey meat on 1 occasion.

His past history is significant for hypercholesterolemia and mild intermittent asthma. His current medications are aspirin, provochol, and albuterol as needed. He has no known medication allergies, including antibiotics. He denies symptoms of allergic rhinitis. He is a nonsmoker and athletically active. The patient does not have a bird in his indoor environment, and the ingestion of eggs does not induce symptoms.
Family history is remarkable for several siblings with asthma and allergies, 1 brother with insulin-dependent diabetes mellitus and his father died of a myocardial infarction at an early age. His physical examination was normal.

METHODS
Skin puncture tests (SPT) were performed with the DermaPik device (Greer, Lenoir, NC) using commercial allergenic extracts of chicken meat (Gallus gallus [domesticus]), egg, mixed feathers, and turkey meat. I considered as positive a wheal and erythema similar to the histamine control in the presence of a negative saline control. I tested baked and grilled chicken breast meat by the prick-prick test (PPT) method as described by Liccardi. The wheal and flare were calculated for both the SPT and PPT. I also tested the chicken meat extract by PPT method in 4 healthy, non-atopic adults. Serologic IgE determinations were not performed due to the striking outcome of the skin tests. An oral challenge test with chicken was considered but not performed due to the concern of precipitating a severe reaction.

RESULTS
Skin tests of all extracts of chicken and turkey meat were positive in the patient, (commercial chicken meat [wheat 6 X 7 mm, erythema 22 X 26 mm], turkey meat [wheat 8 X 11 mm and erythema 25 X 31 mm], grilled chicken [wheat 12 X 16 mm and erythema 25 X 35 mm], baked chicken [wheat 8 X 14 mm and erythema 30 X 34 mm], and histamine [wheat 11 X 15 mm and erythema 30 X 43 mm]). Egg, feather, and saline control SPT were negative. All of the healthy controls had negative PPT with chicken meat extracts with positive histamine controls.

The clinical relevance of the positive turkey meat skin test was initially unclear. The patient was instructed to monitor for symptoms related to eating turkey meat. Subsequently, on 2 separate occasions he ate small bites of deli turkey meat without adverse symptoms. However, on a third exposure he ingested a turkey patty and within minutes experienced intense abdominal pain and sweating without skin or respiratory symptoms. He has avoided all poultry since this most recent episode.

DISCUSSION
This report illustrates a case of severe chicken meat allergy and turkey meat allergy presenting in adulthood without evidence of allergy to feathers, eggs, or other foods. The symptoms began as gastrointestinal symptoms that, with continued exposure, progressed eventually to skin and lower respiratory tract symptoms. What makes this case unique is the onset in adulthood and lack of exposure to birds while growing up. In the other 2 cases where anaphylaxis occurred, the individuals had been experiencing symptoms since early childhood and both had frequent bird exposure.

The chicken’s ancestor is the wild Asian red jungle-fowl found in Thailand, Burma, Sumatra, and eastern India. It was probably the first domesticated bird, tamed by man over 2500 years ago, and there are many references to chickens in Ancient Rome. It is currently the most common bird in the world with at least 63 different breeds identified. Chickens are primarily raised for eggs and meat production, but also kept as pets and exploited in cockfighting.

Chicken meat has rarely been observed as responsible for allergic reactions. The allergic reactions described in the literature include a young adult woman with urticaria-angioedema and severe bronchospasm after the ingestion of chicken and after breathing air near the poultry pen since age 3. IgE immunoblotting revealed proteins at 4 different molecular weights (5, 10, 25, and 35 kD). Cohen reported 2 patients with chicken meat allergy, 1 with urticaria and the other with anaphylaxis. He identified bands at 21, 23, and 50 kD and confirmed cross-reactivity with turkey meat antigen. An anaphylactic reaction to packaged chicken soup occurred in an 18-year-old male. Although skin testing to the packaged chicken soup mixture was positive, he was negative to chicken. Of 25 patients with bird-feather inhalant allergy, 3 went on to develop food allergy to ingestion of chicken, but the symptoms were limited to pruritus, urticaria, or angioedema. The inhalation of fumes from a hot dog that contained chicken meat resulted in a severe asthma exacerbation in a child. Chicken ingestion has been associated with symptoms of oral allergy syndrome in a young woman without egg allergy. The so-called “bird-egg syndrome” occurs when patients exhibit cutaneous and respiratory symptoms after the ingestion of egg yolk and/or inhalation of bird- and chicken-derived materials caused by a cross-reactive allergen (α-livetin, a 70 kD chicken serum albumin protein). Ingestion of chicken serum albumin can lead to systemic allergic symptoms. IgE reactivity to this protein is reduced by 88% by heating. In 57 patients (74% <18 years old) with a convincing history of meat allergy, 23 were positive to chicken by skin or in vitro testing. Turkey, duck, and goose meat cross reactivity was demonstrated with chicken. While the process of cooking may render most proteins less allergenic, 6 patients with chicken allergy showed stronger reactions to cooked chicken.
meat. Finally, chicken ingestion has resulted in a non-IgE mediated colitis in 2 infants.

Although chicken meat was strongly believed to be the causative antigen, a specific meat protein was not sought after. The possibility exists that a component/contaminant of chicken feed could have been present in the meat and thus responsible for the reaction. While antibiotics are commonly used in chicken feed to promote growth by warding off infections, no case of adverse reaction to chicken meat related to antibiotics has been reported. The subject in this report denied adverse reactions to antibiotics.

The unique features of the present case are the onset in adulthood and severity of symptoms without evidence of airborne allergy to feathers or symptoms on ingestion of egg. With an emphasis on diets containing low cholesterol and fat, including limiting the amount of “red meat,” the increased consumption of poultry may potentially be followed by an increase in chicken meat allergy.

CONCLUSION
Chicken meat allergy may induce severe clinical symptoms without concomitant egg or feather allergy. There appear to be similar proteins between turkey and chicken. These symptoms may begin as an adult and, if not recognized, may lead to severe allergic reactions.

REFERENCES