

Angioedema due to type I allergy to snuff tobacco

Tobias Plaza, Gabriele Nist, Christoph Stetter, Peter von den Driesch
Department of Dermatology and Allergology, Center for Skin Diseases,
Stuttgart Clinic, Germany

JDDG; 2007 · 5:300–302

Submitted: 05.12.2005 | Accepted: 27.11.2006

Summary

A 67-year-old male patient twice developed severe angioedema after enjoying a meal and an after-dinner snuff. The cause for these allergic reactions was a type I allergy to tobacco contained in the snuff. In addition to positive prick tests to tobacco, specific serum IgE antibodies (CAP-FEIA) to snuff were found, while prick tests and RASTs for suspected foods were negative. Tobacco belongs to the family *Solanaceae* which includes tomatoes and potatoes and comes from South America. Whenever allergic reactions together with tobacco snuff use occur, a possible type I allergy should be considered and investigated.

Keywords

snuff – tobacco – type I allergy – cross allergy – latex

Patient history

In April 2004 a 67-year-old man visited our clinic for the first time and reported having had adverse reactions after ingesting various foods. In 2002 he had experienced numbness of the lips and facial swelling about 30 minutes after eating Camembert cheese, and the following year he had severe facial swelling two hours after eating sour tripe, dates, and apples. After each event he had immediately sought medical attention and received treatment for angioedema. 250 mg i.v. Solu-Decortin® and one vial of Fenistil® were administered and swelling subsided within 20 minutes on each occasion.

Based on a careful review of the patient's history, a food-induced allergy was initially suspected. Skin prick tests were done with food allergen extracts and fresh whole foods (tripe, apple, bread, dates, Camembert). RAST tests were also done for specific IgE antibodies to beef, pork, mutton, chicken, and apples. Functional activity of C1 inactivator and levels of C4 and C1q protein were also measured.

All relevant test results were negative. A comprehensive follow-up history revealed that prior to each reaction the patient had taken a pinch of Pöschl Gletscher Prise menthol snuff [containing tobacco mixture 1 (various Burley tobaccos) and 2 (Burley and Virginia flue tobaccos) and an aroma oil mixture (manufacturer's secret recipe)]. With the exception of these two occasions, the

patient had never inhaled or smoked tobacco. Skin tests were performed with snuff, inhaled agents including molds, and individual snuff ingredients.

Allergy test results

Skin prick test

Skin prick tests were performed according to standard procedures [1] and the results were read after 20 and 40 minutes.

The patient had three positive reactions each (wheal: 4–6 mm/flare: 11–20 mm) to: snuff mixture 1 (various Burley tobaccos) (fresh), latex solution (Allergopharma), latex milk (Mapa), and *Penicillium notatum* (Allergopharma). He also had two positive reactions each (wheal: 3 mm/flare: 6–10 mm): Pöschl Gletscher Prise Menthol® snuff (fresh), snuff mixture 2 (various Burley and Virginia tobaccos as well as Indian Kurnool tobacco) (fresh), raw Virginia tobacco (fresh), latex solutions (Stallergens), tomato (fresh), hazelnut (Allergopharma), and capsicum (Allergopharma). Other skin test results were negative, i.e., aroma oil mixture (fresh), apple (fresh), dates (fresh), Camembert (fresh), tripe (fresh). Three positive histamine control tests, negative saline control test (Figure 1).

Skin test (3 control subjects)

Skin tests were performed according to standard procedures [1] and the results were read after 20 and 40 minutes.

Negative: Pöschl Gletscher Prise Menthol® snuff (fresh), raw Virginia tobacco (fresh), snuff mixture 1 (fresh). Three positive histamine control tests, negative saline control test.

In vitro examinations

Total IgE of 27.8 kU/l was within the normal range (0–100 kU/l).

CAP System FEIA: tobacco leaves 1.8 kU/l (class 2); negative [< 0.35 kU/l (class 0)]; dates.

RAST-specific IgE: potato 0.97 kU/l (class 2); latex 1.54 kU/l (class 2); negative [< 0.35 kU/l (class 0)]; beef, pork, mutton, apple, *Penicillium notatum*, milk protein, alpha-lactalbumin, beta-lactoglobulin, casein, and tomato.

C1 inactivator (functional activity) 76 % (normal range 60–130 %), complement C4 0.26 g/l (normal range 0.10–0.40 g/l), C1q 141 mg/l (normal range 100–250 mg/l).



Figure 1: (a) Skin prick test: positive response to tobacco, (b) snuff ingredients (tobacco powder, white oil, aroma oil), (c) Pöschl Gletscher Prise Menthol® snuff and raw tobacco contents.

Glove-use test (results read after 20 and 40 minutes)

Right hand: vinyl glove (RET 8872B Triflex® made by Allegiance): negative. Left hand: latex glove (special latex allergen preparation, Semperit): negative.

Discussion

Our patient had recurrent allergic angioedema after using Pöschl Gletscher Prise Menthol® snuff. Tobacco plants (*Nicotiana spp.*) are a member of the nightshades, a family of about 70 different plants, including potatoes, tomatoes, and belladonna, that were originally cultivated in South America. Two species of tobacco in particular are distinguished: the commonly-used cultivated tobacco (*Nicotiana tabacum*) and wild tobacco (*Nicotiana rustica*) which is banned in the European Union due to its high nicotine content. Sniffing tobacco has a much longer tradition than smoking. As early as 1496, Romano Pane, a monk who accompanied Columbus on his second voyage to Haiti, told of natives who snuffed tobacco before consultation with their kings. Tobacco was imported as a medicinal plant to Europe in 1591 and introduced by Jean Nicot to the French court, hence the name *Nicotiana tabacum*. Catherine de Medici took it for migraines and headaches and became one of the first famous snuff users. In 1677 the world's first snuff factory was built in Seville, Spain. In Germany snuff was available for a long time only in pharmacies as an import; the first snuff factory was not built until 1733 in Offenbach. Since the 19th century smoking has gained popularity over sniffing, and snuff use is now relatively uncommon.

In the present case report, our patient had angioedema twice after using snuff. Allergy testing showed immediate hypersensitivity (three positive skin prick tests) to Pöschl Gletscher Prise Menthol® snuff. Based on the positive skin prick responses to raw tobacco mixture 1 contained in the product as well as the positive CAP System FEIA results, we diagnosed a type I allergy to tobacco as the cause of clinical symptoms (angioedema) (Figure 1a and b). The patient refused controlled re-exposure to snuff.

Type I allergy to the foods initially suspected of precipitating the allergic reaction was ruled out on the basis of nega-

tive skin prick results and negative RAST test/CAP System FEIA.

Positive skin test results for hazelnut and capsicum were viewed as evidence of sub-clinical allergy given lacking clinical signs (e.g., oral allergy syndrome) and negative RAST/specific IgE.

Although there are isolated reports in the literature of allergic reactions to inhalation of tobacco, including rhinoconjunctivitis allergica and allergic bronchial asthma, as well as a few cases of allergic contact urticaria in gardeners [2, 3], hypersensitivity generally does not involve clinically-relevant symptoms, especially among smokers and atopic patients [4].

Skin prick reactions to three latex allergen preparations were also positive in our patient and IgE antibodies to latex were detected in the patient's serum. Symptomatic cross-reactivity of tobacco and latex has been described in the literature [5]. Our patient had no known history of clinical symptoms related to wearing latex gloves, inflating balloons, or undergoing dental procedures. Results of a glove-use test were also negative. Thus, at the time of presentation, we interpreted the type I latex allergy without clinical symptoms as a result of cross-reactivity between tobacco and latex. Cross reactions have also been observed between tobacco and other nightshades (tomatoes, potatoes) and mugwort pollen [3]. Our patient had a negative skin test response to potato, although IgE antibodies to potato were detected. Conversely, the skin prick response to tomato was positive, but

serum tests for IgE antibodies to tomato were negative. A manifest type I allergy was ruled out for both foods on the basis of negative CAP System FEIA results and lacking clinical symptoms. There was no evidence of type I allergy to mugwort pollen; skin prick test and RAST results were negative.

Strict avoidance of tobacco (snuff or smoking) was advised and an emergency kit prescribed (cetirizine beta drops, Celestamine N 0.5 liquidum®, Fastjekt® autoinjector). Although the patient did not report any symptoms related to second-hand smoke, he was advised to avoid smoky restaurants and other establishments.

In conclusion, the possibility of tobacco allergy should be considered when assessing patients with a history of type I reactions to food, but negative test results for food allergies. A follow-up history should be taken if necessary. <<<

Conflict of interest

None.

Correspondence to

Dr. med. T. Plaza
Klinik für Dermatologie und Allergologie
Zentrum für Hautkrankheiten
Klinikum Stuttgart
Prießnitzweg 24
D-70374 Stuttgart
Tel.: +49-71 1-52 05 0
Fax: +49-71 1-52 05 35 7
E-mail: t.plaza@kbc-intern.de

References

- 1 Dreborg S. EAACI: Skin tests for diagnosis of IgE-mediated allergy. *Allergy* 1989; 44 (Suppl. 10): 31–37.
- 2 Gleich GJ, Welsh PW, Yunginger JW, Hyatt RE, Catlet JB. Allergy to tobacco: an occupational hazard. *N Engl J Med* 1980; 13: 617–619.
- 3 Ortega N, Quiralte J, Blanco C, Castillo R, Alvarez MJ, Carillo T. Tobacco allergy: demonstration of cross-reactivity with other members of Solanaceae family and mugwort pollen. *Ann Allergy Asthma Immunol* 1999; 82: 194–197.
- 4 Lehrer SB, Stankus RP, Salvaggio JE. Tobacco smoke sensitivity: a result of allergy? *Ann Allergy* 1986; 56: 369–377.
- 5 Hänninen AR, Kalkkinen N, Mikkola JH, Helin J, Turjanmaa K, Reunala T, Palosuo T. Prohevin-like defense protein of tobacco is a cross-reactive allergen for latex-allergic patients. *J Allergy Clin Immunol* 2000; 196: 778–779.