

Fatal outcome of anaphylaxis to camomile-containing enema during labor: A case study

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This article analyzes the case of a woman with a life-threatening anaphylactic reaction to a camomile-containing enema during labor, resulting in asphyxia of the newborn. Camomile is known for its spasmolytic, antiphlogistic, and laxative benefits and became of interest with the increasing demand for medication from natural sources during recent years. It is known that immediate-type hypersensitivity reactions to camomile or other members of the Compositae may occur.¹ However, in the latter the allergenic compounds have not yet been defined.

CASE REPORT

A previously healthy 35-year-old woman was admitted to hospital to give birth to her second child. During labor she was given an enema containing glycerol and Kamilloosan, an oily extract of camomile flowers (2:30 PM). After initial nausea (2:40 PM), urticaria, larynx edema, tachycardia, and hypotension with loss of cardiac sounds in cardiocography developed in the patient (2:55 PM). She required emergency treatment (intravenous corticosteroids, antihistamines, volume substitution, and effortil). At 3:14 PM, an emergency cesarean section was started. The uterus was atonic and bloodless, and accordingly epinephrine was not given. The newborn showed severe asphyxia (pH of 6.85; Apgar score = 0). After initial response to NaHCO₃, the newborn had a tonic-clonic spasm and died the following day. For the patient, a laparogastrotomy became necessary the second day because of hematoma of the abdominal wall and a bleeding gastric ulcer. A postoperative paralytic ileus and septic fever developed in the patient. Antibiotics were administered for 3 weeks.

METHODS

For skin prick testing (camomile, latex, and the standard series of inhalant allergens: pollen of hazel, alder, birch, 6-grass mix, rye,

and mugwort; epithelia of horse, dog, and cat; house dust mite; and storage mite), extracts from ALK Abello (Hoersholm, Denmark) or Kamilloosan (ASTA Medica, Dresden, Germany) were used.

Camomile tea proteins were extracted in PBS. Proteins of Kamilloosan were precipitated by trichloroacetic acid and desoxycholate. Pollen from white birch (Allergon A/B, Engelholm, Sweden) was extracted in potassium phosphate buffer containing protease inhibitors. SDS-PAGE was performed with 10% gels under reducing conditions.

In immunoblots IgE was detected by ¹²⁵I-labeled anti-human IgE (MALT Allergie System, IBL GmbH, Hamburg). For inhibitions, 1 mL 1:4 diluted patient's serum was preincubated with 15 µg recombinant Bet v 1a (rBet v 1a) (Biomay Biotechnik Produktions- und Handels GesmbH, Linz, Austria) or affinity-purified natural Bet v 1 (nBet v 1).

RASTs were performed with the Phadebas CAP RAST system (Pharmacia, Uppsala, Sweden).

RESULTS

The skin prick test with Kamilloosan resulted in a 5 × 5 mm wheal reaction compared with the positive control (6 × 4 mm). Skin prick test responses with latex, glycerol, a standard series of inhalant allergens, including extracts from birch pollen, and the negative control were negative. A healthy volunteer did not react with Kamilloosan in the skin prick test. Moreover, IgE specific for camomile was detected by RAST (RAST class = 2). To identify the allergens triggering anaphylaxis, we analyzed the patient's IgE reactivity in immunoblots. IgE binding to the 17-kd allergens in camomile and (weakly) Kamilloosan were detected (Fig 1, B and C, lane 1). The major birch pollen allergen Bet v 1² has a molecular weight of 17 kd and was recognized by the patient's IgE in blotted birch pollen extract (Fig 1, A, lane 1). IgE inhibition experiments with nBet v 1 purified from birch pollen extract identified the 17 kd allergen in camomile and Kamilloosan as a Bet v 1 homologue (Fig 1, A and B, lane 2). However, IgE binding to Bet v 1 in birch pollen extract (Fig 1, lane 3) and to the 17-kd camomile allergen (data not shown) could not be inhibited by preincubation of the patient's serum with rBet v 1a. Moreover, RAST results with rBet v 1a were negative.

DISCUSSION

Because embolization by amniotic fluid, as well as sepsis, could be ruled out, IgE-mediated anaphylaxis triggered during the enema seemed likely, even though the patient had no history of atopy. Our clinical and serologic tests excluded allergy to latex or to glycerol. IgE-mediated anaphylaxis after the ingestion of camomile tea has

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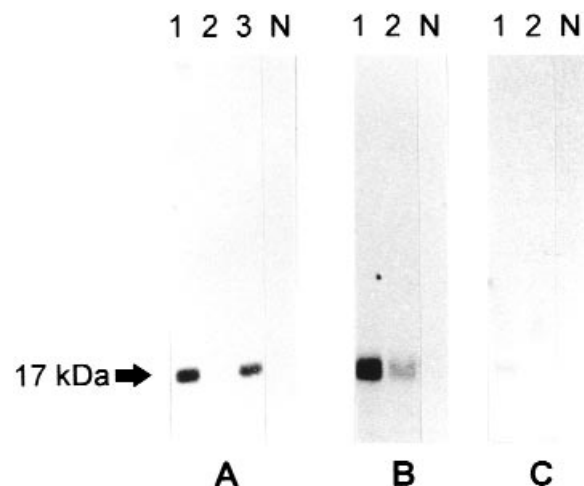


FIG 1. Homologues (17 kd) of the birch pollen major allergen Bet v 1 are present in protein extracts of camomile and Kamillosan and are recognized by serum IgE of the patient who experienced anaphylaxis after a Kamillosan-containing enema. The autoradiogram shows IgE immunoblot and immunoblot inhibition on blotted birch pollen extract (**A**), camomile tea extract (**B**), and Kamillosan protein extract (**C**). Blots were incubated with the patient's serum or serum from healthy nonatopic control subjects (*lanes N*) and bound IgE detected by ^{125} I-labeled anti-human IgE antibody. *Lanes 1* show the IgE binding of the patient's serum, *lanes 2* show the IgE binding after preincubation with purified nBet v 1, and *lane 3* shows IgE binding after preincubation with rBet v 1a.

been described; however, the responsible allergens were not defined.¹ In this study we demonstrate that a homologue of the birch pollen allergen Bet v 1 is present in camomile. Homologues of this molecule are present in a large number of taxonomically related and unrelated plants in which they may lead to serologic and clinical allergenic cross-reactivity.^{3,4} In birch pollen several Bet v 1 isoforms, which differ by a few amino acids in their protein sequence, have been detected. The isoform Bet v 1a

harbors the highest capacity to bind IgE from patients allergic to birch pollen.⁵ However, no IgE binding to recombinant Bet v 1a (rBet v 1a) could be observed in RAST or in immunoblot inhibition testing of our patient's serum. This was in contrast to IgE binding to nBet v 1 in blotted birch pollen extract and to successful inhibition of IgE binding by purified nBet v 1. This indicates that the patient reacted with Bet v 1 homologues in camomile extract that are distinct from Bet v 1a.

The type of extraction of dried camomile plants for the production of Kamillosan yields low amounts of proteins in the product. However, minute amounts of Bet v 1 homologues present in Kamillosan were sufficient for triggering anaphylaxis, which might have been due to the application to a large area of colonic mucosa during the enema. Therefore this case study highlights the potential hazard of allergenic proteins that are present in camomile extracts and suggests that appropriate warnings should be issued with camomile-containing products.

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