

Anaphylaxis after a Mongolian gerbil bite

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Introduction

Animal epithelia contain potent inhalant allergens.¹ Occupational² and non-occupational rhinitis and asthma are quite frequent, but despite the fact that hamsters, mice, and gerbils are common pets, severe allergic reactions to domestic rodents in homes are unusual. There are only few case reports on anaphylaxis after bites by laboratory rodents.

Case report

We report on a 25-year-old white woman with a history of seasonal allergic rhinitis who kept a Mongolian gerbil as a pet for about 3 years. She did not suffer from any inhalant problems when handling her pet. Occasionally she was bitten when playing with the animal, but this resulted in no adverse reactions.

In November 2000, the gerbil bit her right index finger, and 5 min later she felt pruritus in her right hand and wrist. Weals then appeared on her right arm, head and back accompanied by swelling of her eyelids, and after another 5 min she developed dyspnoea. As a pollen-allergic patient she had antihistamines (cetirizine 10 mg, Zyrtec®, UCB, Belgium) at home; she took two of them and called the doctor. At his arrival, her blood pressure was 90/50 mmHg, and pulse 96 beats/min. She was treated with intravenous (i.v.) antihistamines (dimetinden maleate 4 mg; Fenistil®, Novartis) and i.v. corticosteroids (187 mg prednisolone; 250 mg Soludacortin®, Merck, Germany) and referred to the hospital. After an observation time of 24 h she was referred without any symptoms to our department for further allergic exploration.

Skin-prick testing with commercial test solutions from ALK-Abello and Allergopharma (mouse, rat, golden hamster) revealed sensitization to the pollen allergens birch, timothy grass and rye grass and to dander from cat, rat, mouse and hamster, but negative results to dog and rabbit epithelia. Specific IgE antibodies against mice (e88, CAP FEIA, Pharmacia, Sweden)

were class 3 (8.66 kU/L), cat (e1) class 2 (1.33 kU/L), hamster (e 84) class 3 (13.7 kU/L), rat (e 87) class 4 (26.1 kU/L), and negative against rabbit (e 84). Her total IgE was 31 kU/L. As no commercial test solution nor an *in vitro* test is available for the Mongolian gerbil, a skin provocation test was performed by rubbing cut hair of the culprit gerbil on the patient's forearm (left side, volar aspect) for 5 min with a negative result. We then soaked hairs in physiological saline and pricked her right forearm. Physiological saline (Soluprick, Alk-Abello) and histamine chloride (Soluprick, Alk-Abello) served as negative and positive controls, respectively. After 10 min a positive reaction occurred with a weal (8 × 10 mm) and flare (25 × 30 mm) at the site of the test (fig. 1). A similar prick test with natural hamster hair as control was also positive. Such provocation testing with natural and thus non-standardized materials might result in harmful reactions, but as the patient had no history of any reactions when handling the animal (except when bitten) we decided to perform the testing under strict control.

The Mongolian gerbil was then donated to an unaffected person, and our patient has not suffered from any recurrence of anaphylactic episodes during the last 2 years.

Discussion

Laboratory-animal care workers with frequent occupational exposure to aerogen allergens of rodents occasionally show allergic reactions such as mild to moderate allergic conjunctivitis, allergic rhinitis, asthma, and urticaria. Atopy or total IgE of more than 100 kU/L, or allergic symptoms, especially reactions to other animals, appear to have the greatest importance for the development of an allergy against laboratory animals.³

While the nature of the antigen in rodents' saliva is not known, urine is the most potent allergen source in laboratory rodents. Böcskei *et al.*⁴ reported that the most important rat and mouse allergens are pheromone-binding proteins, members of the lipocalin superfamily, α2-globulins in rat and Mus



fig. 1 Positive prick test result and responsible gerbil.

m1 isoallergens (or major urinary proteins) in mice. These proteins are related, showing 66% sequence homology between rat and mouse.⁵ The bulk of these proteins are synthesized in the liver and excreted in the urine.⁶ The mature male rodents excrete up to 300-fold higher amounts than female rodents.⁷ Several studies performed by Gordon *et al.*⁸ describe two cross-

reacting proteins in rat urine with slightly different molecular weights in SDS-PAGE, α 2-globulin and pre-albumin.

Individuals suffering from an allergy to environmental allergens such as pollen of birch and ragweed are more likely to develop allergic reactions to animals.⁹ This may have had relevance in the present case.

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