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Gerbil bite anaphylaxis - A rare case report☆

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ABSTRACT

Household pets are well known to cause allergic symptoms in susceptible individuals, most commonly conjunctivitis, rhinitis, bronchospasm or urticaria. The increasing prevalence of exotic pets, including rodents, may introduce novel allergens into the household setting. We describe the case of a 16-year-old female who presented to the emergency department (ED) with an immediate systemic reaction consistent with anaphylaxis following a bite injury from a pet Mongolian gerbil. Although rare, gerbil bite injury represents another possible allergen source for precipitating a severe allergic reaction.

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1. Background

Animal hair and dander are potent allergens in susceptible individuals, typically affecting the respiratory system. While the vast majority of cases of pet-related allergic reactions are from dogs and cats, the increasing number of household exotic pets has been attributed to a higher incidence of reported allergies from other animals [1]. The Mongolian gerbil (*Meriones unguiculatus*) has been domesticated as a household pet, and can also be found in the research laboratory setting. It has been reported in association with development of respiratory symptoms from hair and dander exposure [2], but to our knowledge there has been only one prior report of severe allergic symptoms related to gerbil bite injury [3].

2. Case report

We report on a case of a 16-year-old Asian female with history of atopic dermatitis and seasonal allergies who presented with abrupt onset of systemic symptoms characterized by facial swelling, urticaria, throat itching, dyspnea, and wheezing occurring about 5 min after sustaining a bite injury to the right hand from her pet Mongolian gerbil.

The patient and her family denied any history of asthma, or known history of drug or food allergy. The patient had never experienced a

severe allergic reaction in the past. The gerbil lived in the home for about four months, and the patient denied prior bite injuries.

Upon ED arrival, vital signs were as follows: temperature 37.4 °C, heart rate 133 beats per minute, blood pressure 124/80 mm Hg, respiratory rate 22 breaths per minute, and pulse oximetry 97% on room air. On examination, she was noted to be in mild respiratory distress with obvious facial (bilateral periorbital) swelling. A diffuse urticarial rash was present on bilateral upper extremities as well as her upper torso. There was no significant tongue swelling, edema of the uvula, or stridor. Cardiorespiratory exam was significant for tachycardia, tachypnea and diffuse expiratory wheezing. A one millimeter fresh puncture wound was present on the dorsal aspect of her right hand, at the site of bite injury.

The patient received 0.3 mg of intramuscular epinephrine, with marked improvement of symptoms noted within minutes. She also received intravenous H1 and H2 antihistamines, corticosteroids, a bolus of normal saline, and nebulized albuterol. The bite wound was irrigated. There were no overt signs of skin or soft tissue infection, and the patient was placed on prophylactic oral antibiotics. After 30 min, the patient was entirely asymptomatic. She was monitored for several hours without worsening or recurrence of symptoms. The patient was ultimately discharged home on oral antihistamines, corticosteroids, prophylactic antibiotics, and an epinephrine auto-injector device.

The patient followed up with an allergist, where skin-prick testing was performed. Testing revealed sensitivity to gerbil epithelium antigens (characterized by development of a wheal of at least 3 mm), as well as sensitivity to cat hair, mouse, hamster, horse epithelia, and rabbit antigens. A new home was found for the pet gerbil shortly after the incident, and the patient and family denied recurrence of symptoms following a six month follow-up period.

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3. Discussion

Severe allergic reaction to a Mongolian gerbil bite injury has only rarely been reported in the medical literature [3] and, to our knowledge, the case presented is the only reported necessitating administration of epinephrine for treatment. This patient's presenting symptoms, as well as the overall course including rapid resolution of symptoms following intramuscular epinephrine and the finding of sensitivity to gerbil allergens on follow-up evaluation, are highly suggestive for the diagnosis of an allergic emergency resulting from gerbil bite injury.

Laboratory workers and pet owners that have frequent contact with airborne allergens from similar rodents have been known to have mild to moderate reactions that may include conjunctivitis, rhinitis or urticaria [4,5]. Molecular studies have identified allergens present in gerbil epithelium, saliva, urine, and sleep bed, including proteins in the lipocalin and serum albumin families [6]. Although skin-prick testing was performed with gerbil epithelium, it is plausible that similar proteins present in gerbil saliva could have played a role in inciting the severe allergic reaction observed in this case.

Patients who have history of environmental allergies may be more prone to developing allergic reactions to animals [7], which may have

been a predisposing or contributing factor given this patient's history of seasonal allergies.

Overall, rodent bites remain a very rare yet potentially serious cause of severe allergic reactions. With the rising prevalence of a variety of animals as household pets, it is important to consider exotic pet exposure in patients presenting with allergic symptoms, including anaphylaxis.

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