

# A rare cause of aeroallergen-induced anaphylaxis: horse allergy

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Animal epithelia and saliva contain a substantial amount of aeroallergen material, causing both acute onset of symptoms related to hypersensitivity, and chronic inflammation of the airways leading to allergic rhinitis or asthma. Although allergy to horses is generally considered to be more prevalent in rural areas, sensitization to horse allergens is more frequent than might be expected in urban residents without any direct or occupational exposure to horses. However, horse allergy is seldom mentioned among animal-induced allergic reactions. Anaphylaxis due to horse exposure is reported even more rarely. Here, a pediatric patient with a hypersensitivity reaction after horse allergen exposure is reported, and the definition of the type of reaction is discussed, as it may be the whole set of locally induced multisystemic reactions that resembles anaphylaxis.

**Key words:** aeroallergen, anaphylaxis, animal, horse allergy.

Animal epithelia or saliva comprises a substantial amount of aeroallergen material, causing not only acute onset of symptoms in relation to type 1 hypersensitivity, but also chronic inflammation of the airways leading to allergic rhinitis or asthma<sup>1</sup>. It has been reported that up to 67% of children with asthma were sensitized to cat and dog allergens<sup>2</sup>. Additionally, allergen exposure results in poor asthma control in cat-sensitized patients<sup>3</sup>. However, horse allergy is seldom mentioned among animal-induced allergic reactions. Despite the fact that it induces asthma, rhinoconjunctivitis, urticaria and eczema<sup>4</sup>, clinicians are less familiar with horse allergy<sup>5</sup>. Nonetheless, it can be fatal, as in the case of the Pulitzer Prize-winning New York Times correspondent Anthony Shadid, who in 2012 died of a severe asthma attack due to a horse allergy. He had been constrained to walk behind some horses when was traveling on foot from Syria to the Turkish border because it was too dangerous to go in a car<sup>6</sup>.

Although allergy to horses is generally considered more prevalent in rural areas, sensitization to horse allergens is more frequent than might be expected in urban residents without any direct or occupational exposure to horses<sup>7</sup>. Nonetheless, anaphylaxis due to

horse allergy is very rarely reported<sup>8</sup>. Here, we report a child with a hypersensitivity reaction after horse allergen exposure.

## Case Report

A nine-year-old asthmatic girl was admitted to the emergency room due to sudden onset of dyspnea, cough, swelling of the upper eyelids, chemosis and urticaria without any fatigue or dizziness. The urticaria manifested first on the lower abdomen, then became widespread. The symptoms occurred within minutes after she had ridden a horse for the first time at a stud farm. Her blood pressure was 80/60 mmHg (normal for her age, height and weight), and her respiratory rate 32/minute. She was diagnosed with anaphylaxis and treated with adrenaline, an antihistamine, a systemic corticosteroid and inhaled salbutamol, after which the symptoms disappeared. She had been on budesonide (400 µg/day) treatment, with her asthma under control. Four years ago, in an assessment of asthmatic symptoms, she had been interpreted as sensitized to cat hair and grass pollen by skin prick tests. After she recovered from anaphylaxis, skin prick tests were performed with (Stallergenes SA, Anthony, France), revealing sensitization not

only to grass pollen mix (9x6 mm), cynodon (13x8 mm) and cat hair (6x3 mm), but also to horse hair (16x5 mm). Specific IgE to horse epithelia was measured with Uni-cap (Phadia, Uppsala, Sweden) technology and found to be 6.64 kU/L (class 3). She was prescribed an adrenaline auto-injector.

### Discussion

The leading trigger of anaphylaxis in childhood is the ingestion of allergenic food<sup>9</sup>. Aeroallergens are seldom implicated for anaphylaxis since they in general act solely on the upper or lower respiratory tract, based on their size<sup>10</sup>. However, aeroallergens may also cause conjunctival or cutaneous allergic reactions by acting topically on the conjunctiva or skin. Urticaria may occasionally develop by contact of the aeroallergen with the skin. The most common cause of occupational contact urticaria has been found to be cow dander<sup>11</sup>. Airborne particles of many kinds of foods also provoke acute allergic reactions by way of inhalation as well as asthma in the case of occupational settings<sup>12</sup>. The responsible allergen in our case is horse allergen, which is an aeroallergen. So it may be questionable whether the reactions that occurred after exposure to such a high level of horse allergen were due to anaphylaxis or were the sum of local reactions affecting both the cutaneous and respiratory systems simultaneously. In accordance with the description of anaphylaxis, this event may be labeled an anaphylactic reaction affecting two organ systems at the same time<sup>9</sup>. However, we believe it is doubtful whether the reaction occurred systemically or locally. Local action of allergens in such an environment, with large amounts present, is also possible in the case of this event. Since there were two routes of entrance for the allergen to the body—one through the skin, the other through the respiratory system—it seems that two organ systems were affected in a local fashion. So, all these reactions can be considered a locally induced multisystemic reaction. On the other hand, the reported cases for anaphylaxis after exposure to cat<sup>13</sup> or dog<sup>14</sup> allergens occurred after bites from these animals. Systemic rash and dyspnea occurred 30 minutes after the cat bite, which acted systemically like an injected allergen<sup>13</sup>. In addition to these, although anaphylaxis due to horse allergen is very rare

both in childhood and adulthood, it has been reported in a six-year-old girl<sup>8</sup> and an eight-year-old boy<sup>5</sup>, in whom both respiratory and cutaneous systems were affected, indicating locally induced systemic reactions.

Even if the reactions reported herein are local reactions, the choice of treatment with adrenaline is quite correct in the authors' opinion, because it decreases mucosal edema, upper airway obstruction and wheezing within minutes after administration.

Although allergic reaction due to horse allergen is infrequently mentioned in comparison with reactions due to cat and dog allergens, it can pose a potential cause of morbidity even in urban settings. Although rarely reported, it may cause multisystem-involving, possibly lethal reactions in a previously nonsensitized patient.

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