

Animal Originated Allergens and Measures to Reduce Exposure

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Abstract: Many of the animal allergens widespread in the world sources from mammalian or arthropod animals. Here, some of the allergens defined by the I.U.I.S (International Union of Immunological Societies) were listed by indicating their primarily body location in the source animal. There is evidence that allergen exposure avoidance causes to decrease both in developing of sensitization and in severity of the allergic symptoms. Recommendations for specific environmental allergen avoidance are lined up for house-dust mites, pet animals and cockroaches.

Key Words: Animal allergens, avoidance measures.

Hayvansal Allergenler ve Korunma Yolları

Özet: Dünyada yaygın olarak bulunan birçok hayvansal allergen, memeli veya artropodlardan kaynaklanmaktadır. Burada, IUIS tarafından tanımlanmış bazı allergenler, kaynak hayvan organizmasında bulunduğu yerlere vurgu yapılarak listelenmiştir. Allergenlerden kaçınmanın hem allergene karşı duyarlılığın gelişimini hem de allerjik tepkinin şiddetini azalttığına ilişkin deliller mevcuttur. Ev tozu akarları, pet hayvanlar ve hamam böcekleri allergenlerinden sakınmak amacı ile önerilen özgün çevresel tedbirler sıralanmıştır.

Anahtar Kelimeler: Hayvansal allergenler, korunma yolları.

Introduction

Animal originated allergens are proteins or glycoproteins of 10 to 50 kDa molecular weight. These proteins are soluble and able to penetrate the nasal, respiratory, digestive and ocular mucosae. In most areas of the world, house dust mites are a major source of allergens in indoor environment. Dust mite allergens associated with mite fecal matter are enzymes that originate from the mite's digestive system. Many of mammalian allergens originate in secretions, either saliva, urine, sweat, sebum, perianal gland secretions, and contaminate the fur, hair, dander and bedding. These allergens are carried on small particles that remain airborne for hours and are widely distributed through the homes,

schools, offices, or automobiles, places where the animals themselves may never go.

Allergy is an overreaction of the immun system to these proteins that are otherwise harmless. Inhalation, digestion and contact are the ways for allergens to enter body. After a period of time varying from few weeks to many years, humans or animals exposed to allergens become sensitized, that is, they develop symptoms when exposed again, even in small amounts of the allergen. Symptoms, diagnosis and treatment of the allergic reactions each are the task of other reviews.

Knowledge on the prevalence of the sensitized human or animal against animal allergens is very limited in Turkey. Dust mites were des-

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ignated to be more prevalent source of the allergic rhinitis and asthma in humans in few researches in central Anatolia¹⁻⁵ Sensitivity to pollens, fungi, and animal dander followed dust mites. In these studies, range of positive cases varied between 5 to 30 percentages, and, the people living in urban was found more sensitive than living in rural. In veterinary clinics, allergic symptoms have been encountered in some extent in pets, but, unfortunately there is not certain knowledge on the prevalence of the sensitized animals against animal originated allergens.

Today, more than 500 animal allergens have been defined by the I.U.I.S. Allergen Nomenclature Sub-committee (www.allergen.org). Some allergens prevalent in the world and dominant in their sources are tabulated below by indicating their primary location in the animal's body (Table I).

Table I. Some animal allergens worldwide and their primary locations in the body.

Tablo I. Dünyada sık rastlanan bazı hayvansal orijinli allergenler ve bunların vücutta temel bulunma yerleri.

Animalia	Allergen	Body Location	Ref	
Artropoda				
Astigmata	Acarus siro	Aca s 13	Body extract	6
	Dermatophagoides farinae	Der f 1	Feces, urine, extract	7
	Dermatophagoides pteronyssinus	Der p 1	Feces, urine	8
Blattaria	Blatta germanica	Bla g 1	Feces, urine	9
		Bla g 2	Digestive tract	9
		Bla g 4	Body extract	10
		Bla g 6	Muscle	11
Diptera	Aedes aegypti	Aed a 1	Salivary gland	12
Hymenoptera	Apis mellifera	Api m 1	Bee venom	13
Siphonaptera	Ctenocephalides felis felis	Cte f 1	Salivary gland	14
Chordata				
Carnivora	Canis familiaris	Can f 1	Sebum, hair, dander	15
		Can f 3	Serum, salivary gland	16
	Felis domesticus	Fel d 1	Sebum, dander	17
		Fel d 2	Serum	18
Cetartiodactyla	Bos domesticus	Bos d 2	Sebum, dander	19
		Bos d 4	Milk	20
Galliformes	Gallus domesticus	Gal d 1	Egg white	21
		Gal d 2	Egg white	21
		Gal d 4	Egg white	21
		Gal d 5	Serum	22
Lagomorpha	Oryctolagus cuniculus	Ory c 1	Saliva, hair	23
Perissodactyla	Equus caballus	Equ c 1	Saliva	24
		Equ c 2	Sweat	25
		Equ c 3	Sweat	25
		Equ c 5	Sebum, dander	26
Rodentia	Cavia porcellus	Cav p 1	Sebum, hair, urine	27
	Mus musculus	Mus m 1	Urine	28
	Rattus norvegicus	Rat n 1	Urine	29
Salmoniformes	Salmo salar	Sal s 1	Muscle extract	30
Nemata				
Ascaridida	Anisakis simplex	Ani s 1	Excretory gland	31
	Ascaris suum	Asc s 1	Body fluid	32

The main principal for prevention from allergens is to remove the source and reservoir of the allergen. Although, it is impossible to make environment allergen free, there is effective methods to decrease excessive exposure. These methods change depending on the habitat of the animal and the characteristics of the allergic proteins.

Following recommendations were lined up from the excellent reviews³³⁻³⁵ and research article³⁶ published in the last decade. More detailed information about the each measurement can be found in the literature.

Dust Mite Allergens

- Encase pillows, mattresses and comforters (prefer dust proof covers, less than 10 µm pore, fine weave, vapor-permeable or plastic cover).
- Wash beddings monthly in hot (above 56 °C) water.
- Remove carpets (If its not possible, treat carpets with a natural salt, Aluminium Potassium Sulfate Dodecahydrate, at the dose of 9 g / m² in 10% water solution).
- Get rid of furry toys.
- Replace cloth-upholstered furniture (prefer leather, vinyl, or wood).
- Clean or launder clothes frequently.
- Use a good quality vacuum cleaner with HEPA filter (wear mask, leave room for 20 minutes after cleaning).
- Damp – dust instead of vacuuming.
- Ventilate your house (A dry indoor climate will reduce mite allergen production, prefer strong and portable dehumidifiers).

Pet Allergens

- Evict animal (Sometimes its impossible emotionally).
- Restrict the pet to one area (especially keep the pet out of bedroom).
- Use high-efficiency air cleaners (Most of these allergens stay airborne for hours).
- Wash the pet weekly (washing should be done by a person who has not sensitized against the pet allergens).
- Remove carpets and other reservoirs for allergens (allergen is very persistent, and control may require aggressive cleaning and removal of heavily contaminated items).

- Clean or launder clothes frequently.
- Consider changing your work if you exposure to allergens occupationally (wear mask, ventilate surroundings from central to the periphery).

Cockroach Allergens

- Take professional assistance to fight against cockroaches. (Use suitable pesticide in bait form, seal cracks in walls and plaster work to reduce further access)
- Vacuum and wet-wash home thoroughly.
- Wash dishes daily.
- Place trash outside the home daily.
- Store food in sealed plastic containers.
- Remove sources of standing water (leaking plumbing).

An allergic person mostly tends to be sensitive to more than one allergen. In that case, recommendations may change and become more complex.

Conclusion

Avoidance from the allergens is the first step to have a healthy life for sensitized people. Many useless recommendations published to avoid allergens make the subject confusing and unbearable. Some more prevalent allergens and their sources were outlined above. Measures lined up against allergens should strictly be followed.

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