

## Hypersensitivity Reaction in Dogs **Kriths Jaerbyn\***

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Department of Animal Research,  
Karolinska Institute, Solna, Sweden

### Introduction

Allergic injections into dogs effectively relieve itching and improve quality of life. Immunotherapy is important early in a dog's life as environmental allergies progress and worsen with age. Dog allergy shots (immunotherapy) are effective when the dog's allergy is a type I hypersensitive immune response. Dog allergies are the result of a hypersensitive immune system that overreacts to stimuli. The most common type of allergic reaction seen in dogs (and the dog itself) is type I hypersensitivity (there are four types, but this article only covers type I).

Basically, an allergy is an excess or inaccurate reaction of the immune system. When the body is exposed to foreign proteins such as those found in viruses and bacteria, it usually makes antibodies called IgG to neutralize the foreign proteins. In some animals and humans, the body produces IgE instead of IgG, from which the problem begins [1].

Hypersensitivity is technically an immune response; consequently it calls for preceding exposure. This method an affected person will commonly now no longer have a response the primary time they're uncovered to an allergen due to the fact the frame wishes time to react and make IgE. Also, with regard to meals primarily based totally allergic reactions, its miles viable to increase a meals hypersensitivity to a meals supply which the affected person has been ingesting for years. Allergies can also extrude with age, so the effects of 1 take a look at might not be the identical years later as new allergic reactions can increase with time [2].

### Allergic Reaction

In a typical allergic reaction, reactive chemical called histamine is released from the granules of cells called mast cells. Mast cells are stimulated to release this chemical by a protein called IgE (actually a type of antibody). IgE is specific for certain allergens (these are foreign proteins found in pollen, foods, molds, etc.). When the body is exposed to a particular level of a particular allergen, it reacts by releasing IgE that is specific to that allergen. Next, IgE stimulates mast cells. The mast cells in turn release histamine ("degranulate") which causes the inflammatory reactions seen in common allergies. In people, the offending chemical IgE and mast cells, are in highest concentrations in the respiratory tract and mucous membranes (eyes, nose, mouth), but in dogs the concentration is much higher in the skin. This is why people more often have "hay fever" symptoms and dogs experience itchy skin [3].

### \*Corresponding author:

Kriths Jaerbyn

✉ Jaerbyn.k@zoologi.su.se

Department of Animal Research, Karolinska  
Institute, Solna, Sweden

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### Symptoms

1. Diarrhoea
2. Vomiting
3. Lethargy
4. Swelling or redness at the vaccine site
5. Puffiness around the ears, muzzle, and/or eyes
6. Bumps or hives all over the body

### Types

There are several different types of allergic reactions that can occur:

1. Anaphylaxis although rare, this allergic reaction is life threatening and can result in respiratory failure, cardiac failure, shock, and death if left untreated. The reaction could happen within minutes or hours of injection. Common signs include sudden vomiting, diarrhoea, seizures, coma, shock, cyanosis, a weak but rapid pulse, and facial swelling.
2. Eye and neurologic disease Inflammation of the brain or eyes may occur, although this is also rare.
3. Reactions at the injection site Irritation, swelling, pain, and redness can develop at the site of injection, typically anywhere from 30 minutes to a week after the vaccine is given. Abscesses can also form at the injection site.
4. Respiratory problems Mild cough, sneezing, or runny nose can occur as an allergic reaction to intranasal vaccination.
5. Loss of activity and appetite, depression and low-grade fever these symptoms may appear about 1-2 days after vaccination.

## Causes

Allergic reactions depend on the type of vaccine given.

1. The development of an allergic reaction depends on the immune system of the individual dog and how it reacts to the components of the vaccine.
2. The breed and age of your dog also influences whether they are allergic
3. Researchers have found that the more vaccines given at the same time, the higher the risk of allergic reactions, especially in small dogs.

## Diagnosis

If an allergic reaction to the vaccine occurs immediately after or minutes after being administered at the vet's clinic, the vet's clinic can provide relief and treatment as soon as symptoms appear. If your dog is vaccinated and returns home with any of the symptoms associated with an allergic reaction, contact your veterinarian immediately, especially if the symptoms are severe [4].

Veterinarians usually do not need to have a formal test to determine if they have an allergic reaction to the vaccine. Instead, clinical signs and test results, along with recent vaccination records, are probably sufficient to diagnose the condition in a timely manner. However, veterinarians are advised to perform a complete blood count, urinalysis, and faecal analysis to determine if the organ system in the body is adversely affected. These diagnostic tools can also determine if a pet has an underlying medical condition that may have caused a vaccine response [5].

## Treatment

Treatment for vaccine allergic reactions in puppies will rely upon the extent of hypersensitive reaction and the sort of vaccine that turned into administered. Your veterinarian will decide what the perfect remedy could be after very well analysing your canine [6].

If your puppy is experiencing a moderate response to the vaccine which includes redness across the injection site, the veterinarian might also additionally administer an antihistamine or an injection of Cortisone to lessen the swelling. If there may be vomiting, the veterinary crew might also additionally reveal your canine for a further time earlier than permitting you to take your canine domestic.

In the case of an anaphylactic response, your canine might also additionally need to be admitted to the hospital for intravenous remedy or extra scientific intervention which includes oxygen help or epinephrine. Once the veterinarian feels he's out of danger, your puppy could be allowed to head domestic. The veterinarian might also additionally advocate you reveal your puppy at domestic for the following numerous hours to few days [7].

## Type I Hypersensitivity

Type I, or immediate hypersensitivity, encompasses IgE mediated responses to foreign antigens. These reactions may be minor and local or may be severe and generalized. In its most extreme form, type 1 hypersensitivity or allergy is expressed as a lethal shock syndrome called anaphylaxis. Anaphylaxis is an acute systemic

manifestation of the interaction of an antigen (allergen) binding to IgE on mast cells and basophils. The antigen binding triggers the mast cell to release a complex mixture of inflammatory mediators, including:

1. Histamine
2. Leukotriene
3. Eosinophil chemotactic factors
4. Platelet activating factor
5. Kinins
6. Serotonin
7. Proteases
8. Cytokines

Some of these molecules directly affect the vascular system, causing vasodilation and increased vascular permeability, and the smooth muscles, causing contraction. Other mediators attract eosinophil to the reaction site. The severity of anaphylaxis depends on the type of antigen, the amount of IgE produced, the amount of antigen received, and the route of exposure [8]. If the animal has been previously exposed to an allergen (antigen) and produces high levels of IgE antibodies, administration of the sensitizing antigen directly into the bloodstream can cause anaphylactic shock and related allergic reactions such as urticaria, urticaria and facial conjunctivitis there is edema. If the hypersensitivity allergen enters through the mucous membrane or skin, the allergic reaction is usually more localized. Antigens that can cause anaphylaxis and allergic reactions are diverse and include insect stinging and biting venom, some vaccines, drugs, food, and blood products [9].

Allergy testing is the best way to find the source of some allergens to see if there is something that can be removed from the environment or diet, or if there is a specific serum that can be made for the pet in question so that they are not nearly so reactive to that allergen [10]. Once tested, a serum or "vaccine" can be manufactured that is specific for the offending for a given patient. The idea behind this is to inject small concentrations (Immune Modulating allergy shots) of the allergens to teach the body to make IgG instead of IgE. This Immunotherapy (Hypo sensitization) can take a few months to a year before a patient responds favourably to the injections, and there are cases in which some patients never respond properly. Many people are stopped by the cost of the testing up front, but if they were to add up all financial costs of the exams, tests, pills, injections, and topical medications that they end up buying to treat the chronic skin and ear issues; plus the physical cost to their pets from the chronic inflammation, irritation, discomfort, and infections from the allergies, then testing will almost always pay for itself in the long run. Please remember that allergies also can change with age, so the results of one test may not be the same years later as new allergies can develop with time [11]. If a patient that has been doing well on injections for a period of time develops symptoms again, it is often recommended to retest to be sure a new allergy has not developed. If one has, then the serum for the injections needs to be changed.

## References

1. Kennis RA. (2006) Food Allergies: Update of Pathogenesis, Diagnoses, and Management. *Vet Clin North Am Small Anim Pract* 36: 175-184.
2. Shawn M. (2000) *The Allergy Solution for Dogs*: 1-10.
3. Jarolim JE. (2017) *Comparative Medicine: Disorders Linking Humans with their Animals*. Cham, Switzerland: Springer: 121
4. Lowell A. (1994). *Guide to Skin and Haircoat Problems in Dogs*: 14
5. Dodds WJ. (2015). *Canine Nutrigenomics: The New Science of Feeding Your Dog for Optimum Health*. Dogwise Publishing.
6. Lara-Villoslada F, Olivares M, Jiménez J, Boza J, Xaus J. (2004) Goat milk is less immunogenic than cow milk in a murine model of atopy. *J Pediatr Gastroenterol Nutr* 39: 354-360.
7. Savage JH, Matsui EC, Skripak JM, Wood RA. (2007) The natural history of egg allergy. *J Allergy Clin Immunol* 120: 1413-1417.
8. Rancé F. (2003) Mustard allergy as a new food allergy. *Allergy* 58: 287-288.
9. Taylor SL. (2008) Molluscan shellfish allergy. *Adv Food Nutr Res* 54: 139-177.
10. Pastorello EA, Ortolani C, Farioli L, Pravettoni V, Ispano M, et al. (1994). Allergenic cross-reactivity among peach, apricot, plum, and cherry in patients with oral allergy syndrome: an in vivo and in vitro study. *J Allergy Clin Immunol* 94: 699-707.
11. Akagawa M, Handoyo T, Ishii T, Kumazawa S, Morita N, et al. (2007) Proteomic analysis of wheat flour allergens. *J Agric Food Chem* 55: 6863-6870.