

FOOD ALLERGIC DERMATITIS HYPERSENSITIZATION

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Abstract

One of the most common diseases encountered in a dog's life is dermatitis. Wet dermatitis, seborrheic, dermatitis, and atopic are just a few of the common cases in the canine species. A particular dermatitis that can be considered trivial, but difficult to treat is food dermatitis. This is the most difficult to detect because there are no specific tests that can indicate the source of dermatitis, as can be identified, for example in flea dermatitis caused by contact skin with its saliva. The common and the first clinical sign of all dermatitis is pruritus, regardless of the nature or secondary infection preceded by the inflammation. Food allergic dermatitis can be treated by testing and eliminating every nutrient in the animal's diet. To see if the food is good or not for the body it takes a few months of administration and any change in it can lead to other eczema, even if it has been treated before. The purpose of writing this article is to know the skin pathology of the animal and to give the right food.

Keywords: dermatitis, food allergy, hypersensitivity, parasites, pruritus.

1. INTRODUCTION

Over time, humans have developed an ever-evolving pleasure in raising animals. If hundreds of years ago we were talking only about the need to raise animals and thus they represent human food, in 2022 we have reached the stage where animals are legally considered family members. This implies that an owner is responsible for the welfare of the animal in his house.

The most beloved pet is the dog. At the same time, the body of domestic canids and felines becomes the most medically problematic. A few years ago there was raised the problem of simple pathologies of infectious, parasitic, oncological origin, and so on, so that now we have to face thousands of problems at the level of each system.

On the agenda, we discuss the dermatological pathologies that have come to occupy the 1st place in the care of a dog. With multiple clinical signs, various tests but also combinations of secondary infections, the animal's well-being is constantly decreasing.

Food allergic dermatitis in dogs is only one of the types of allergic dermatitis, which we mention: atopic dermatitis, wet dermatitis in dogs, seborrheic dermatitis, and nasal dermatitis.

2. CONSIDERATION RELATED TO FOOD ALLERGY DERMATITIS

Atopic dermatitis

The true prevalence of food allergies in dogs and cats is unknown. A recent literature (Cherie M. Pucheu-Haston, 2022), review of 28 high-quality manuscripts found that the reported prevalence of food allergy varied depending upon the specific population evaluated. For example, 1%–2% of

dogs and < 1% of cats presenting for any form of veterinary care were found to have some form of food allergy. This percentage increased considerably in pets presenting for any form of dermatitis (0%–24% of dogs; 3%–6% of cats) or pruritus (9%–40% of dogs and 12%–21% of cats).

Atopic dermatitis refers to a skin condition inherited from several races that over time proves a hypersensitivity to certain harmful substances in the environment, or chemicals (DeBoer, Hillier, 2001).

Atopic dermatitis can manifest itself seasonally and begins at the age of 1-3 years.

Breeds such as Dalmatians and terriers are particularly prone to this type of dermatitis. In the case of atopic dermatitis, the diagnosis is difficult to establish, due to the symptoms, similar to other types of dermatitis. Therefore, the dog should be subjected to a set of tests for allergens. Untreated atopic dermatitis causes hair loss in the affected area or bleeding crusts, which promotes recurrence. The legs, face, and ears are the most sensitive areas for atopic dermatitis, and the dog will frequently scratch in these areas. A bacterial infection can occur in the ears, for which the wax-producing glands are responsible for the allergy (Dulman et al., 2014).

Wet dermatitis in dogs

Pyotraumatic (wet) dermatitis, also called *hot spot*, is a lesion on the skin, which results from constant scratching. Thus, a damp, hairless lesion forms on the irritated skin, which the dog aggravates by the same scratching gestures (Crivineanu et al., 2014). Wet dermatitis can occur suddenly due to a bacterial infection, especially in the hot season when the dog may spend more time in the water, or in time if the animal scratches heavily in an area affected by eczema. The saliva that it leaves on the skin when it repeatedly licks the wound is the main factor that leads to wet dermatitis. The result is pain, which will affect the animal's daily behavior (Favrot et al., 2010). The lack of hair in some affected areas, the redness, the crusts, and the odor which can be unpleasant sometimes are just some of the representative signs of wet dermatitis. Most of the cases we can observe different untreated skin infections and in this situation, we talk about the appearance of the hot spots in just a few hours (Olivry et al., 2010).

Seborrheic dermatitis

Seborrheic dermatitis (dandruff) often affects dogs and, if left untreated, can lead to more serious conditions (Dessinioti, Katsambas, 2013).

Seborrheic dermatitis can be oily or dry. Dogs usually have a combination of both forms.

This type of dermatitis is visible through an oily substance that extends from the back of the ears to the abdomen to the wrists.

Emergency treatment is recommended, as the animal will be severely scratched in the affected areas, and can lead to serious skin infections.

We are dealing with the typical, persistent smell in dogs, as well as dandruff flakes like those in human hair, which can be seen in areas rich in seborrheic glands (Solcan et al., 2003).

Nasal dermatitis

Nasal dermatitis can be caused by:

- bacterial or fungal infections
- external parasites.

In this type of dermatitis, the area of the nose with hair is affected. In cases where the pigment of the nose is affected in the hairless part, this indicates the presence of a systematic disease (most often Lupus).

Prolonged exposure to the sun during the summer, and plastic vessels used for food and water can lead to irritation of the nose and the appearance of lesions in nasal dermatitis (Blicharz et al., 2020).

Solar nasal dermatitis is more common in short-haired dogs and those who spend a lot of time outdoors (in the yard).

Contact nasal dermatitis is caused by exposure to cheap plastic food that contains chemicals that are harmful to sensitive dogs. This plastic blocks the production of melanin and leads to depigmentation of the skin of the nose. In the case of breeds such as the Border Collie and the German Shepherd, nasal dermatitis is almost always a sign of Lupus (Shyma et Vijakumar, 2011).

3. A GENERAL ANALYSIS OF THE RELATIONSHIP BETWEEN THE TYPE OF DERMATITIS AND FOOD RICH IN PROTEINS

The type of food-allergic dermatitis is caused by the dog's diet and is recognized mainly by the existence of red spots, crusty wounds, and secretions.

Dietary dermatitis occurs as a result of a reaction to one of the dog's food chemicals, especially protein.

Prolonged consumption of one of the protein-rich foods can lead to body sensitization over time, but an allergic reaction can also occur on first contact with a particular food (Săvuță, 2007).

The food arrives after ingestion inside the digestive tract, in the stomach, and then in the intestine. Efficient digestion causes a pronounced disintegration of proteins, up to the elementary components that make them up, ie amino acids (Solcan, Vulpe, 2011).

Amino acids then cross the barrier of enterocytes (cells on the surface of the intestine) to be used by the body. In some cases, more complex proteins that do not break down to amino acids or certain amino acid chains cross this barrier.

There is a hyper reaction at this time, as a disproportionately strong feedback from the immune system, which *feels* these compounds as *intruders*. Involved in this abnormal response are mast cells (immune cells); they release from within a compound - histamine, a mediator of inflammation. The more allergy episodes there are, the more intense the response will be. For this reason, some episodes of allergy may start weaker, as an outside observer, but as the body encounters the food trigger again, it will be all the more affected by the allergy.

This is due to the "memory of the immune system", which can store information related to the trigger factor (allergen), to respond more effectively to the next "meeting". The resulting inflammation will irritate, and itching. The subject's (dog's) answer will be scratching.

If a dog's food allergies started when they were adults, they had typically been given allergens for more than two years (Guaguere, Prelaud, 2007).

The abdomen, distal half, and area of the face and armpits are the most affected by food dermatitis.

The skin is the largest organ of the body and can account for about 12-24% of an animal's weight.

Among the many functions of the skin, we list:

- the ability to serve as a closed barrier to ensure effective protection of the environment;
- temperature regulation factor;
- sensory perception factor.

Inflammation of the skin can be caused by:

- numerous agents, including external irritants;
- burns;
- allergens;
- trauma;
- infections (bacterial, viral, parasitic, or fungal) (Constantin, 2005).

At the same time, it should be noted that inflammation of the skin is associated with coexisting internal or systemic diseases. Allergies form a group of important etiological factors, especially in small animals (Crivineanu et al., 2014).

The skin's response to injury is generically referred to as dermatitis and is manifested by any combination of hair loss, desquamation, erythema, thickening of the skin, hyperpigmentation, and fatty seborrhea are all symptoms of itching.

A skin disease typically progresses from a starting point (disease syndrome), which results in primary lesions including papules, pustules, and blisters.

Itching is a recognized common clinical symptom in a variety of disorders. (Dell et al., 2012).

In diseases that are not inherently pruritic, it is most commonly present due to one of the causes that take one of the following forms:

-or a further infection;

-or as a result of the release of inflammatory mediators.

As the inflammation progresses, crusts and scales form (Saridomichelakis, Olivry, 2016). If this process involves deep dermis, the following may occur:

- exudate - represents the secretion product that is formed during an inflammatory process of the mucous membranes and various tissues of the body; it is rich in albumin and is formed by passing the serum through the walls of the vessel, into the neighboring tissues; it is also defined as an extravasated liquid in an inflammatory focus or cavity, as a result of increased blood pressure in small vessels and capillaries, as well as damage to their walls;

- pain;

- necrosis - the death of a cell within a living tissue, which occurs following a process of autolysis (degradation of cells and tissues in plants and animals under the action of their enzymes), (Proskuryakov et al., 2003); necrosis can be induced as a result of the action of external factors: infection, trauma, the existence of toxins;

- with an effect on the irregular digestion of cellular components; at the opposite pole, we have apoptosis (the physiological process of programmed cell death with beneficial effects on the body, while necrosis does not provide benefits and almost every date can be fatal) (Kasper, Zaleznik, 2001).

As a result of skin inflammation, secondary bacterial or fungal infections usually develop.

Chronic dermatitis causes the primary lesions to disappear and is accompanied by indicators of chronic inflammation in place of the acute signs of inflammation (such as erythema) (thickening of the skin, hyperpigmentation, scarring, seborrhea).

The skin typically grows drier at this phase; if pruritus wasn't present at the beginning, it will happen regularly. Pruritus often ranges in severity from mild to severe. The reaction to glucocorticoids varies from poor to excellent, claim Gadeyne et al. (2014).

Finding the source and treating any problems or secondary infections is necessary for dermatitis recovery (Kahn, Cynthia, 2014).

Both allergic and non-allergic reactions to food, known as food intolerances, can result in adverse consequences. Practically speaking, both phrases are frequently used interchangeably because it is typically uncertain what immune system is responsible for the majority of food-related adverse reactions. Type I, III, and IV immune reactions are thought to be the most likely etiologies, however, this is purely conjectural for the majority of cases described in small animals. In herbivores, food allergies are extremely uncommon.

In dogs, food allergies are 10% as frequent as atopic dermatitis, and in cats, they are virtually as common. The history is typically one of non-seasonal pruritus with only minor fluctuations in severity from one season to another.

The majority of papers make no mention of a preference for any one breed, however, one did mention a relatively high risk in the Labrador Retriever, West Highland White Terrier, and Cocker Spaniel varieties. severe enteropathy and nephropathy from protein loss. The onset might occur at any age, from 2 months and 14 years. According to a survey, the majority of food allergies manifest before the age of one year. Most dogs have been fed allergens for more than two years if their food allergies began in adulthood.

Animals differ widely in how their pruritus and lesions are distributed. The most prevalent and occasionally the only charge seen is ear canal disease, which is characterized by pruritus and subsequent infections with bacteria (often *Staphylococcus pseudointermedius*, *Pseudomonas* spp., or fungi, *Malassezia pachydermatis*). Other signs include blepharitis, widespread pruritus, generalized seborrhea, a papular rash, or a pattern of distribution that could be a flea bite hypersensitivity dermatitis or atopic dermatitis (legs, face, and ventral area) (lumbosacral dorsal part, and hind limbs).

The ears, feet, groin, armpits, proximal anterior face of the forelimbs, periorbital region, and muzzle are the most often studied locations. Typically, pruritus ranges from mild to severe. The response to glucocorticoids ranges from subpar to exceptional.

The optimal elimination diet should be nutritionally full, balanced, and free of any substances that have previously been given to the animal. New sources of protein or carbs can be found in many diets (game and rice). Dietary testing will fail if an item that was previously given to the animal is present in the elimination diet and the animal might be allergic to that ingredient.

Any elimination diet's main principle is that only fresh ingredients should be consumed. Utilizing hydrolyzed protein diets, where the protein supply is hydrolyzed to low molecular weights that are non-allergenic, is an additional choice.

The test diet should be given for up to 3 months. If there is a marked or complete improvement in pruritus and clinical signs during the elimination test diet then we may suspect a food allergy. previous foods, after which the clinical signs must be remitted. After this challenge, clinical indications typically return between an hour to 14 days. Following confirmation of the food allergy, the elimination diet should be resumed until the clinical symptoms subside, which typically takes fewer than 14 days. The elimination diet should now include the previously provided components for up to 14 days. The specific substances are deemed to have a positive etiological role in a food allergy if the itching returns. The specific chemical is not thought to be crucial in creating clinical symptoms if the itching does not return.

The number of food allergens involved varies from 1-5 ingredients. The most common etiological allergens identified in canine food allergy are:

- life
- the hen
- egg
- corn
- wheat
- soy
- the milk.

4. CONCLUSIONS

Food allergy management involves strictly avoiding allergens after they have been identified.

Skin rashes come in a variety of forms, including:

- Contact dermatitis is a type of dermatitis that develops when your body rejects a material. Numerous people are sensitive to nickel (frequently included in costume jewelry), scents, preservatives, and poison ivy. Soaps, detergents, chemicals, and household cleansers are examples of common irritants.
- Hives, also known as urticaria, are raised, itchy welts on the skin. If you experience an allergic reaction to airborne allergens or insect bites, you could develop hives. Hives may also be triggered by severe temperature fluctuations and specific bacterial diseases.
- Skin rashes are a common indicator of several viral diseases, such as molluscum contagiosum, measles, and chickenpox.
- Eczema, also known as atopic dermatitis, frequently appears in infancy and becomes better as a kid gets older. It usually runs in families (genetic). Eczema is more common in people with asthma or allergies.
- Psoriasis: A thick, scaly rash is the result of this chronic skin condition. The lower back, scalp, elbows, knees, and genitalia are frequent sites of the rash. Psoriasis may run in families.

Occasionally, a dog will react to a new food allergen.

Concomitant illnesses can complicate the identification of food allergies. These are:

a) - allergic dermatitis

Certain breeds of dogs inherit dermatitis that affects them sooner or later in life. The dog's hypersensitivity to certain allergens is the main factor in the development of allergic dermatitis. Allergic contact dermatitis refers to a condition of the skin repeatedly exposed to plastic, rubber, wool, or paints. Dog paws are extremely sensitive to allergic contact dermatitis. These body parts can be exposed to toxic substances at any time during walks, or even at home if the quadruped is allergic to cleaning products used on textiles with which it often comes into contact by rubbing.

If it is affected by allergic contact dermatitis, the dog repeatedly scratches the area and bites his skin insistently.

The areas most affected are those with the least fur. If it is observed that the animal is scratching or rubbing a certain area of hard objects in the house, red spots, and areas with dry and injured skin should be looked for on its skin, as well as the triggering factors that influenced the appearance of dermatitis to remove them.

b) - flea bite hypersensitivity dermatitis

Allergic dermatitis is most often favored by flea bites, more precisely by the saliva left by them on the dog's skin. Dogs that are at risk of developing allergic dermatitis due to flea bites are those that have been rarely exposed to this type of bite, at which point the body tries to defend itself and reacts to the substance in the flea saliva.

This manifests hypersensitivity to flea bites. To be affected for a few days, the animal does not need to be infected with fleas. A single flea bite can affect the quadruped for 5 to 7 days.

If fleas are identified in the dog's fur and it continues to scratch, look for any reddish spots that may indicate allergic dermatitis.

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