AGRICULTURAL EXTENSION JOURNAL
ISSN 2582-3302

Available Online at www.aextj.com
Agricultural Extension Journal 2019; 3(4):177-180

REVIEW ARTICLE

Immunotherapy in Atopic Dermatitis in Dogs

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Received: 30-06-2019; Revised: 01-08-2019; Accepted: 02-10-2019

ABSTRACT

This paper describes a method of performing immunotherapy in the treatment of atopic dermatitis in dogs. It also presents a method of sublingual immunosuppression in humans as an alternative to injection. Mechanisms of immunotherapy at the cellular level are shown the advantages and disadvantages of immunotherapy which describes the most important elements in the performance of injection allergens given schematic tab helpful in carrying out immunotherapy. Attention is paid to the education of the owner of the animal while driving immunotherapy.

Key words: Allergens, atopic dermatitis, cutaneous inflammation, dog, sublingual immunotherapy

INTRODUCTION

Nowadays, allergic diseases in humans as in dogs are one of the more often occurring diseases in the world. These diseases occur more commonly refers to animals but also human. Sometimes, in extreme cases, these can too severe immediate hypersensitivity reaction lead to anaphylactic shock and death of an individual sensitive. Atopic dermatitis is one of the diseases listed substrates allergic in dogs, humans. The pathogenesis is complex, the base of which there are allergens that in the dog sensitive (but also in humans) is responsible for causing the clinical symptoms of the disease as itching. Itching results in skin damage complicated by pathogens – bacteria, fungi, etc. The pathogenesis of atopic dermatitis is described in the articles previously published by the authors.[1-6]

Image scratching the dog is extremely frustrating for the owner and for any price he wants that his pet is not scratched. Because of the constant use of the drugs used in the treatment of atopy in dogs do not have many side effects. Moreover, it happens that they do not work at all. One method that may be beneficial in the treatment of this disease in dogs is immunotherapy. During the interview, the study detailed the health of a dog is suspected of atopy, performed a test intradermal administration of allergen, and observed the resulting erythema. With its intensity is read on what the dog may be allergic. However, you have to remember that positive results were observed in healthy dogs. In dogs, atopic dermatitis also is not 100% sure. The gold standard does not exist. The study of immunoglobulin E (IgE) levels did not correlate with clinical symptoms of the disease. Immunotherapy is used in a situation where we wish sensitive subject can cause permanent modification of the immune response to an administered allergen. What manifest resignation or decrease the severity of the clinical reaction. Implementation of immunotherapy comprising administering to increasing doses, solutions of allergens at a certain time interval – weekly, monthly, etc. This aims at giving a sensitive body a certain degree of tolerance kind of allergen/ allergens. Clinically, this leads to a reduction or alleviation of allergy symptoms in an individual in contact with the same allergen walking. Also keep in mind that these treatments are not always and not in every case give satisfactory results. It is one of

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the methods of the treatment of atopic dermatitis, to minimize the risk arising from the long-term use of drugs (steroids). Immune mechanism which accompanies this process is unclear. The induction of immunoglobulin G (IgG) antibodies called "Locking" (in particular subclass IgG4). These antibodies react with the allergen from binding of IgE to the allergen or by blocking the IgE production. It was also observed increase in the regulatory T lymphocytes synthesize interleukin (IL-10) and lower levels of IL-4 that interacted with the treatment of human disease. Similar effects were observed in dogs with atopy. The level of interferon (IFN)-gamma and IL-4 in dogs with symptoms of atopic dermatitis was treated with immunotherapy which was lower as compared to healthy dogs not suffering from the atopic dermatitis.[7-10]

However, a study by Dandrieux, 2008, it was found that the growth rate of setting IgG1 did not correlate with clinical improvement of dogs sick, in the author's opinion, there must be other unknown mechanisms which affect immunotherapy. The success of immunotherapy does not depend on age or race, largely depends on the skill of the doctor in the administration of the allergen, and also indirectly from the owner.[11]

ADVANTAGES AND DISADVANTAGES OF IMMUNOTHERAPY

Advantages

- Effective in large breed dogs
- Reduced cost of treatment
- Maintenance therapy is less labor intensive than the administration of drugs orally or by injection
- An increase in IgG1, IgG4 affecting the antigen-specific antibodies that block IgE binding to an allergen
- Decrease in the release of inflammatory mediators from cells (mast cells) and by reducing the influx of inflammatory cells to the inflammatory foci
- Increased expression of the gene for IFN-gamma, thus reducing the immune response of lymphocytes derived from a T helper 2 (Th2) (which dominate atopy), hung low response is derived from Th1 cells.

Disadvantages

- Subcutaneous injections
- Adverse reactions (swelling, anaphylactic shock, etc.)
- Break in administration of doses of allergen cannot be too long (to stick to a particular regimen allergens)
- A long time is necessary administrations of the allergen to be a visible effect
- Reactions observed after the administration of allergen/allergens is the basis for the correction applied allergens.

Place administration of allergens

This may be the area of the cross in the dog's neck but always keep in mind that the subsequent doses, administered allergens were applied to a different location of the body of the dog. In 1 week, the application takes place in the neck and the next will be performed in the area of crosslike. If we do not watch, then at repeated administration of the animal will be felt discomfort in the form of pain, there may be thickening of the skin, swelling, etc. Very important is the detailed, sometimes to a fault education owner, during immunotherapy started to look for, when you return from a veterinarian to home. What type of clinical symptoms has to pay special attention. When you experience symptoms such as hives, swelling, and vomiting, should immediately contact your doctor. You should not use drugs on their own. Anaphylaxis reaction is rarely observed (this is the most dangerous complication from immunotherapy). During her speech, to save the patient's life at risk should be given methylprednisolone, epinephrine, and diphenhydramine hydrochloride in the relevant therapeutic doses. The owner should be instructed on what scale is observable by him at the level of itching owned a dog (on a scale from 0 to 10); this information should be recorded in the diary immunotherapy. This will allow for a possible adjustment of administered solutions allergens. If we observe, in the dog with whom we use immunotherapy, adverse reactions are to be in the next period of administration of allergen is given, a dose that does not cause these symptoms, do this and in the next period as well and then try a higher dose. There are many regimens allergens. You could say that it is a combined method – changes

in the volume and the amount of allergen solution. Start with a dose of 0.1 ml/h to the final stage of treatment to increase it to 0.05 ml/day. However, this information should be recorded in a diary the use of immunotherapy and systematically corrected. In addition, a dog with atopic dermatitis, in the course of therapy, allergen-specific immunotherapy should be given to special control external parasites (fleas, mites, and *Cheyletiella* sp.), deworming, control secondary bacterial and fungal infections, apply supplemental diet, as well as baths in special shampoos.

Sublingual immunotherapy

This is a new method of administration of allergen immunotherapy. This method gave good results in the treatment of allergic humans. Preferred proved to be a grass pollen allergen, a dust mite, but insect venom allergens are not suitable for this method. These allergens, insect venoms have to be administered in a conventional manner by injection. The mucous membrane in the mouth, especially in the sublingual space, where it is most glycerin in the gel administered allergens. Glycerin facilitates absorption of the allergens. During sublingual administration, a small amount of allergen is taken up by dendritic cells. These cells then migrate to regional lymph nodes, whereby interaction with T cells causing their differentiation into regulatory T cells. Only regulatory T cells modulate Th1 and Th2. Th2 is inhibited and increased Th1 response. Furthermore, IL-10 and transforming growth factor-beta play a role in this process. There are blocking IgG (IgG4) that the reaction IgE and the allergen are blocked. What brings a beneficial clinical effect. This road seems to be the most secure in susceptible individuals. They can appear such as symptoms, swelling of the mouth, and itching, which after a few days to resolve spontaneously. This method is also the future of the treatment of various types of food allergies that are observed in humans. Allergies to allergens that are in touch with hazelnut allergens peaches, peanut allergens like. It is important to oral mucosa which was not damaged, and you cannot do this treatment (administration of the allergen gel) after brushing the teeth must wait several days.

At the moment, this experimental method began to be used in the United States, the Food and Drug Administration approved it for use in humans.

If given good results in people with allergic diseases are the question arose, whether in dogs with atopic dermatitis will work similarly. The first attempts to be positive. But its wider use we will have to wait veterinarians. There were developed standardization administration protocols allergens, allergen dose has not been determined. For now, this method in dogs is in the experimental phase. Certainly, it will be beneficial as a replacement of classical immunotherapy injection. In a situation, when there are adverse reactions in dogs following allergen sensitive. You must also skillfully specify allergens gel into a dog, but in such quantities that they do not swallow too quickly because this leads to decrease stimulation of the immune system in dogs.[12-17]

CONCLUSION

This paper describes a method of performing immunotherapy in the treatment of atopic dermatitis in dogs. It also presents a method of sublingual immunosuppression in humans as an alternative to injection. Attention is paid to the education of the owner of the animal while driving immunotherapy. We would conclude that immunotherapy in atopic dermatitis in dogs can reduce the allergies by using drugs and can provide survival to dogs.

REFERENCES

1. Kasperska-Hare A. *Candida albicans*, the causative agent of allergic diseases. Allergy Asthma Immunol 2002;7:248.
2. Maciej K. Fungal allergens in atopic dermatitis in dogs. Vet Med Pract 2010;3:124.
3. Maciej K. Food allergens. Vet Pract 2011;2:25.
4. Maciej K. Selected cytokines in atopic dermatitis in dogs. Vet Med Pract 2011;1:119.
5. Maciej K. Cat flea and the flea allergic dermatitis. Vet Med Pract 2011;1:299.
6. Maciej K. Infection *Staphylococcus* sp. as a complication of atopic dermatitis in dogs. Vet Mag 2011;20:112-4.
7. Bousquet J. Allergen immunotherapy: Therapeutic vaccines in allergic diseases. Allergy Asthma Immunol 2000;5:256-15.
8. Caraballo J, Villa RC. Clinical and immunological changes of immunotherapy in patients with atopic dermatitis: Randomized controlled trial. Allergy 2012;2012:183983.
9. Hilton R. Atopic Dermatits: Anecdotes and Evidence;

2010. http://www.skin.vet.org. [Last accessed on 2011 May 11].
10. Dandrieux J. Influence of Allergen Specific Immunotherapy on Allergen-Specific IgG Subclasses in Dogs with Atopic Dermatitis. France: Dissertation; 2008.
11. Maciej K. Selected cellular mechanisms of atopic dermatitis in dogs. Vet Med 2015;1:134-10.
12. Maciej K. Genetic basis of atopic dermatitis in dogs. Vet Med 2015;3:26-10.
13. Maciej K. Disorders of the epidermal barrier in atopic dermatitis. Vet Med 2015;2:64.
14. Maciej K. Apoptosis in Atopic Dermatitis. Veterinary News; 2015.
15. Nowicki R. The role of infection in the team atopic dermatitis. Allergol Rev 2005;1:456.
16. Shida M. Allergenic immunotherapy induces specific Th1 SHIFT feature in dogs with atopic dermatitis. Vet Immunol Immunopathol 2004;102:65.
17. Ozmen J, Marsella R. Sublingual immunotherapy in human and canine atopic dermatitis: A mini review. Vet Sci 2014;1:136-49.