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Clinical management of food allergy in a dog

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Abstract
A four year old female pug was presented with patchy hair loss and intense pruritis. The dog was maintained on a commercial diet for more than a period of two years and was switched over to another commercial diet for the past two weeks. No history of tick or flea infestation was reported in the past six months. Physical examination of the dog showed several patchy areas of alopecia on the trunk, hind legs and perineum. Pustular lesions were seen on the ventral abdomen with crusts and scaling. Skin scrapping was negative for mites. Based on the clinical history of a severe cutaneous reaction which was seen after the introduction of new diet, physical examination and skin scrapping the diagnosis and treatment was focussed towards food allergy. A methodical approach with antihistamine, antibiotics, antifungal and a commercial hypoallergenic diet has provided a better clinical outcome in a period of six weeks.

Keywords: Dog, Adverse reactions, food allergy, hypersensitivity

Introduction
Food allergy is an immunological response to the ingested allergen present in food which may be an artificial food additive, food preservative, meat of different species, oat meal, potatoes and rice (Rakshanda *et al*., 2017) [9]. Food allergy is commonly encountered clinically in dogs and cats. Adverse reactions in dogs and cats to allergens present in food is the commonest form of hypersensitivity and frequently reported to occur next to flea allergic dermatitis and atopic dermatitis. Canine food allergy occurs as a non-seasonal pruritus (regional or generalized) with involvement of ears, feet, inguinal or axillary areas, face, neck, and perineum. (Verlinden *et al*., 2006) [13]. Though it is a commonly presented condition, prompt identification and treatment is essential for a better prognosis.

Materials and Methods
Case history and Diagnosis
A four-year-old female pug weighing 9 kg was presented to Eden Pets Care, Mogappair, Chennai with the history of with severe hair loss and intense pruritis. From the owners history it was understood that the dog has been on the same commercial diet for a period of more than 2 years and was suddenly switched to a new commercial diet. Pruritis with extensive loss of hair was seen after the start of new diet. Physical examination of the pet showed rough hair coat, several hyperpigmented areas of alopecia on the trunk (Fig.1) and on the perineum (Fig. 2). Ventral abdomen showed several pustular areas and scaly crusts. No evidence of external parasites was present. Skin scrapping was taken from three sites to check for the presence of mites.

Results and treatment
A skin scrapping was negative for mites and the appearance of clinical signs after introduction of new diet has shifted our focus on the presented dermatological condition as food allergy. The dog was clinically managed with oral medications such as anti-histamine Hydroxazine @ 2.2 mg/kg B.W, Cephalexin @ 30 mg/kg B.W and Ketoconazole @ 5 mg/kg B.W. Topical follicular flushing along with antibacterial, antifungal shampoo was used once in three days. The pet parent was advised to immediately stop the new feed and advised to start a commercially available hypoallergenic diet. Supplements such as vitamin, mineral and fatty acid was also included in the treatment regimen. The dog has shown an uneventful recovery after a period of 6 weeks with reappearance of hair and no trace of skin lesions. (Fig.3)

Discussion

Food allergy is a clinically abnormal exaggerated immunological reaction/response to the ingested allergen present in food. The terms the food allergy and food hypersensitivity are used interchangeably. All food reactions cannot be considered as food allergies (Gaschen and Merchant, 2011) [5]. Though dog of any age can be presented with food allergy, (Rosser, 1993) [10], has reported 33% incidence in < 1 year, 51% in 1-5 years and 16% in 5-11 years of dogs respectively.

The antigenic dietary components could be the protein and carbohydrate source in pet food, certain foods and food ingredients which are poorly digestible. If the pet has any disease that increases intestinal permeability, selective IgA deficiency and any other allergic disease, the less digestible material are absorbed intact through the gastrointestinal mucosa and triggers the immune system (Roudebush *et al*., 2010) [11]. The response mostly, is of type I (immediate) hypersensitivity reactions, mediated by immunoglobulin E (IgE) but in some cases both types III and IV hypersensitivity may also be involved (Kennis, 2002) [7].

The allergen penetrating the physiological mucosal barrier interact with gastrointestinal associated lymphoid tissue leading to a Th2- mediated response in which the cytokines interleukin IL-4 and IL-5 are released. These in turn stimulate IgA production and immune responses involving mast cells and eosinophils. In type I reactions IL-4 and IL-10 which stimulate B cell proliferation and induce IgE production. The resultant IgE binds to mast cells and sensitizes them. If the allergen reaches the sensitized mast cell, it releases histamine, proteases, as well as several leukotrienes and prostaglandins (Befus *et al*., 1982) [1]. The release of several chemical mediators would have been responsible for the dermatological signs seen in this case.

Reactions can affect many body systems and can produce signs involving the skin, gastrointestinal tract, respiratory tract and central nervous system (Day, 2005) [4]. The most observed dermatological clinical signs in cases of food allergy are pruritus,alopecia/hypotricosis, erythema, scaling, pustules (localized or disseminated), abdominal hyperkeratinization, Gastrointestinal signs, otitis externa, Generalized pruritus, localized pruritus in interdigital areas, ears, periocular, axillary, perioral and perineal in two dogs (6.9%) (Gaschen and Merchant, 2011) [5] and most of the above lesions was noticed in the present case.

It is important to differentially diagnose food allergy with atopy, flea bite hypersensitivity, ectoparasitic diseases, drug hypersensitivity and folliculitis. The diagnosis in cases of food allergy is usually based on the clinical history, parental observation, physical examination, laboratory test, diet selection, allergic tests and use of a challenge/test diet (Hill,1999) [6].,The main therapy of food allergy consists of avoiding offending foods (carlotti *et al*., 1990) [2] and on the performance of dietary restriction-provocation trials (Mueller *et al*., 2016) [8], (wills and Harvey, 1994) [13]. (Chesney, 2002) [3] reported that most of the pets could be maintained on long term on a commercial restricted-component diet. Management is with anti-histaminics, antibiotics, antifungal and feed diets balanced with vitamin, mineral and omega-3 and omega6 fatty acid supplements (Rakshanda *et al*., 2017) [9].

Fig 1: Rough hair coat, several hyperpigmented areas of alopecia on the trunk

Fig 2: Hyperpigmented areas of alopecia on the perineum

Fig 3: Recovery with reappearance of hair and no trace of skin lesions

Conclusion

Though food allergy is one of the most pleomorphic skin diseases seen at the clinical practice, a methodical approach is required to establish a definitive diagnosis. It is usually non seasonal and a long term management of food allergy in the dog requires avoidance of the offending allergen. Even though periodic rechecks are required, the prognosis is considered good with a methodical approach in dogs that are being presented with dermatological lesions associated with food allergy

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