Distribution patterns and differential diagnoses of pruritus in dogs

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The distribution patterns of pruritus provide key information in the formulation of differential diagnoses in dogs. It is important to assess these patterns when there is no evidence of concurrent infection. Bacteria and Malassezia can contribute to pruritus and may obscure the true underlying cause. Response to therapy is also very important. If there is no evidence of pruritus during antibacterial or antifungal therapy in dogs that present with recurrent infections, then metabolic disorders such as hypothyroidism or hyperadrenocorticism should be considered. Demodicosis can also be a non-pruritic cause of recurrent infection.

It is important to communicate with the client that "itching" is not just physical scratching. Licking, biting, chewing, rubbing, rolling, and head shaking are all clinical signs associated with pruritus. It is easy for our client to tell us that their dog itches all over the place all the time. It is up to us to identify key locations to accurately make a diagnosis. "Cleaning of the feet" is commonly appreciated by our clients as normal, but is an important clinical finding in allergic patients.

Response to steroid is an important clinical clue. Generally speaking, atopy tends to be very steroid responsive at least initially. Repeated steroid usage may lead to the development of tachyphylaxis. Atopy is considered to be a type I hypersensitivity. Flea allergy can be a type I and or type IV hypersensitivy. Type IV hypersensitivity reactions may not respond to steroid administration or may require higher dosages than what is usually required to manage pruritus. Food allergy can be a type I, type III, or type IV hypersensitivity reaction or any combination. Steroids may or may not be helpful. Scabies is considered to be a type IV hypersensitivity. Epithiotropic T-cell lymphoma may be extremely pruritic and not responsive to steroids. New therapies such as oclacitinib (Apoquel) and Cytopoint are variably effective against our allergic disorders and are not helpful in using response to therapy to help define the disease process.

Seasonality is usually a key factor in differentiating food allergy from atopy. Food allergy tends to be non-seasonal as our dogs tend to eat the same dietary components all year long. Atopy tends to be seasonal with waxing and waning pruritus through the year. In the south, atopy tends to be non-seasonal because of dust mites and tree pollens that are present throughout the winter months. Molds also tend to be a cause of non-seasonal pruritus. This becomes more challenging when comparing food allergy to atopy. Broadly speaking, onset of clinical signs associated with atopy tends to be seen between 1 and 3 years of age. It is uncommon for dogs to develop atopy at an older age unless there were significant changes in the regions where the dog lived. Food allergy can present in dogs greater than 3 years and sometimes less than 1 year. I prefer to not do food trials or atopy testing on young dogs until a seasonality is established, but there are exceptions.

Ear pruritus can be seen with atopy, food allergy, scabies, and otitis. It is important to resolve any perpetuating causes of otitis such as bacteria, yeast, or polyps. Scabies tends to affect the margins of the pinnae and tends to be intensely pruritic. The "pinnal-pedal reflex" can occur with all of the

aforementioned disorders and is not diagnostic for scabies. Atopy and food allergy are common pruritic causes of recurrent otitis. Non-pruritic causes of recurrent otitis would include hypothyroidism and hyperadrenocorticism. Contact reactions to topical medications can be an additional cause of pruritus. Contact hypersensitivities are usually type IV, delayed reactions.

Facial pruritus can be quite variable. Muzzle pruritus vs periorbital pruritus can be helpful in differentiating food allergy from atopy. Oral allergy syndrome is a component of adverse reactions to food and associated with a type I hypersensitivity of food allergy. Clients may indicate that their dog "cleans his face" right after eating. This may manifest by paw scratching or rubbing the muzzle on the floor. If these clinical signs are seen, a food trial is warranted. Periorbital pruritus can be seen with atopy or food allergy. It may also be seen with ocular diseases such as pollen allergy or irritant reactions. Seasonality can help differentiate atopy from food allergy when this clinical sign is identified. Chronic periocular pruritus can lead to chronic bacterial infections. Ocular medications for KCS that contain oil may spill onto the haired skin, leading to a nidus for Malassezia growth which would be associated with pruritus. Periorbital demodicosis should not be pruritic. Pruritus of the chin can be associated with both food allergy and atopy. Physical scratching can lead to severe deep bacterial pyoderma that can be extremely difficult to manage.

Foreleg pruritus is usually associated either food allergy or atopy. Dogs may lick the forelegs or physically chew as if eating corn on the cob. The elbow region is a typical area for scabies mites. When present, the pruritus tends to be specific only for the elbow region of the forearm. Dogs will frequently be pruritic within the cranial elbow region ("crelbow"). This region is frequently associated with secondary infection due to bacteria or yeast so cytology samples are clearly warranted.

Foot pruritus is commonly associated with either food allergy or atopy. The pruritus may manifest as chewing or biting of the feet, licking, biting of the toenails or physically chewing the foot pads. It makes sense that pollens, molds, dusts, and insects will be in contact with the interdigital spaces. There is usually history that there is increased pruritus after being outside. Some dogs will preferentially avoid grassy areas for elimination. These are the clues that the patient has atopy. It is less intuitive why food allergy is associated with foot pruritus. In food allergic dogs there is a loss of tolerance and increased absorption of proteins into the blood stream. These proteins can interact with IgE molecules bound to mast cells leading to degranulation (type I hypersensitivity reaction). There tends to be more mast cells at distal extremities and openings to the outside which will partially explain the distribution pattern of pruritus. Infections due to bacteria and yeast are common causes of foot pruritus. These can be seen independently or in conjunction with food allergy or atopy. It is important to resolve these infections to see if there is a pruritic underlying cause. We have seen an increase in the number of dogs who have Malassezia paronychia. These can be treated with topical therapy but it is usually inadequate. Systemic therapy is often times required. Some dogs will have fairly large numbers of yeast without being pruritic while other dogs will chew and lick the claws excessively.

The axillary regions are pruritic when food allergy or atopy are present. Given the conformation of the intertrigo region, secondary infections can lead to pruritus. Because the axillary regions tend to be partially or sparsely haired, this may be a sight for allergic contact dermatitis. It can be difficult at times to differentiate axillary from thorax pruritus but should be considered the same general region. Dogs with scabies do tend to be intensely pruritic on the elbows and not necessarily the axillae.

The ventral region of the abdomen overlaps with all of our pruritic disorders including: food allergy, atopy, flea allergy, contact allergy, scabies, and infectious dermatitis. It tends to be a confounding rather than useful differentiating clinical sign. When intense erythema is present, a type IV hypersensitivity reaction should be considered. Scabies, allergic contact dermatitis and sometimes flea allergy are associated with this reaction.

The back ½ of the body is usually associated with flea allergy. Though the dorsal lumbar region is most commonly affected, it is not always the case. Flea allergic dogs may be pruritic anywhere on the back ½ but the feet are usually not affected. Dogs who preferentially chew on hocks should be investigated for scabies. With chronicity the severity and distribution will spread beyond the hocks. Broadly speaking, atopy and food allergy are more front half of the body while flea allergy tends to be the back ½. The ventrum overlaps with everything. Pruritus of the back feet are more likely food allergy or atopy.

Pruritus of the perianal region may be seen in dogs with food allergy or atopy. Perianal pruritus may also be seen with anal sac impaction or abscess or perianal fistulae. This region may also be affected by dogs with epithiotropic T-cell lymphoma. The dogma of "ears and rears = food allergy" is just not true. Seasonality will be the most important data when these regions are affected.

In general:

Atopy: face, feet, ears, armpits, forelegs (or any combination)
Food allergy: face, feet, ears, armpits, forelegs (or any combination)
Flea allergy: back ½ of the body
Scabies: ears (margins), elbows, hocks, ventrum (or any combination)
Contact allergy: sparsely haired regions of the body (intense erythema)