Skin and nervous system derive both from the same embryonic tissue: the ectoderm. The functional relationships between those two tissues are well known and described in human medicine, even if there are still some burning controversies regarding the underlying mechanisms leading from psychological disorders to dermatological symptoms. In veterinary medicine, it is still questioned. The relationships between anxiety-related disorders, excessive licking and dermatological disorders are now well accepted\(^1,2,3,4\), but the possible influence of emotional disorders on the evolution of atopy or other dermatological conditions is much more controversial\(^5\). However, our current approach of the relationship between behavior and skin is always a single-sense approach: psychological disorders influence the skin, leading to dermatological disorders. Such an approach is excessively simplistic and ignores some of the crucial functions of the skin:
The skin is a sensory organ: dermatological conditions will impair this function.
Some glands, especially sebaceous and sudorous, release odorous secretions which play a major role in chemical communication\(^6\). Any infection or biochemical impairment will disorganize this function, leading to abnormal social reactions.
Dermatological conditions can induce pain reactions which are well identified as major causes for stress.

**Behaviour-Related Skin Disorders:** they are usually related to anxiety. According to current understanding of those disorders, we can divide this group in two subgroups taking in account the functional link between the behavioural cause and its dermatological consequence.

Skin disorder induced by excessive self-licking or scratching. Those disorders have been described in both dogs and cats. In dogs, they are described under the name “acral lick dermatitis”\(^7\). The lesions are usually observed on the legs, flanks and tail, beginning on the left side of the body in 70% of the clinical cases\(^8\).

The spontaneous evolution of the disorders leads to an extension of the lesions which may be, then, observed on every accessible part of the body. In cats, such behaviours lead to “extensive alopecia” or “granulomas”\(^9\).

In both dogs and cats, the differential diagnostic is a major concern\(^9\). When the lesions can be regarded as somehow typical, the situation is really different in cats, extensive alopecia being first a typical consequence for flea allergy or other allergy-related disorders. Such a situation has led many authors in proposing the diagnostic “behaviour-related skin disorders” as an exclusion diagnostic: if you fail in finding a physical cause, it might be a behaviour problem. Such an approach cannot be accepted in modern medicine and a positive diagnostic may be accessible by taking in account the other symptoms which are typical for anxiety. Thus, the clinical approach will take in account the other behavioural signs (impaired scanning behaviour, inhibition, fear-reactions, fear-aggressions, impaired sleep) as well as the biological indicators: prolactin, ACTH, cortisol, neutrophils to lymphocytes rate. If there is no evidence for anxiety, the skin disorders have probably no relationship with the behaviour.

Skin disorders related to chronic stress: this is more a hypothetic group. Many authors have described, in different species, the consequences of chronic stress: impaired immune system, hyperesthesia, modified cell-renewing, modified sebaceous and sudorous secretions\(^10,11,12\). Such phenomena should play a role in the evolution of atopy, allergy, seborrhea or pyodermatitis. From a pragmatic point of view, it makes sense to look at the possible signs for chronic stress and to treat possible underlying anxiety in dogs and cats suffering such skin disorders.

Skin-Related Behaviour Disorders: according to our current understanding, we can identify three groups of disorders:

Semi-chemical disorders: the word “semi-chemicals” is the name for the odorous secretions playing a role in chemical communication (the pheromones belong to this group). Any disorder affecting the glands releasing such secretions (with hormonal or infectious causes), may impair the intraspecific communication. The inflammation of the anal sacs, in dogs, is one of the most famous disorders within this group\(^9\).

Pain-related disorders: observed in dogs and cats suffering pyodermatitis, violent pruritus or otitis externa. Behaviour disorders will include aggression, anxiety and depression.

Tactile-impairment related disorders: it seems to be more a “feline problem” with an impairment of predatory behaviour as a consequence for the impairment of the tactile capabilities.

**References**

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### AUTONOMIC DISORDERS RELATED TO BEHAVIOUR PROBLEMS

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The activation of the autonomic system is a common mechanism in stress-related reactions and other anxiety-related problems. Depending on the species, the physiological consequences can deeply differ. When horses have been described for displaying severe modifications of the heart-rate, dogs and cats seem to display more digestive and urinary reactions.

The occurrence of such reactions cannot be regarded as a typical symptom for pathological behaviours. Whatever the cause for an emotional reaction, it usually includes autonomic modifications which may play an adaptive role for coping with a hostile surrounding. On the contrary, when the autonomic signs are frequently observed, the clinician must value this information as a significant symptom for diagnosing anxiety-related disorders. The clinical approach is sometime very easy when those signs are observed associated with behavioural signs (agression, threats, inhibition, panic, …). On the contrary, the clinical approach will be more difficult when the autonomic signs are the only owners’ claim and when they fail in describing, spontaneously, any other sign.

**Autonomic Disorders in Cats:** digestive and urinary disorders are very commonly observed in this species. The recent development of our understanding of the interstitial cystitis is a good example for this group of disorders. Anyway, the common point between all those patients is an underlying emotional disorder and more specifically anxiety. The diagnostic is obtained thanks to a behavioural approach that will lead to identify fear-related behaviours, to the biological approach (hormonal indicators, white blood cells) and to an “ecological” approach taking in account the organization of the surrounding (location of the resources, density of population, …).

**Autonomic Disorders in Dogs:** the digestive signs are very commonly observed. Some authors have described a predisposition in some groups of breeds and especially in the molossoid dogs and some shepherds (e.g. German shepodr). The colic part of the gut is more specifically affected leading to diarrhea, meteorsim and sometime vomiting. Such dogs are usually first treated by colleagues working in general practice or specialized in internal medicine, with a diagnostic of “idiopathic” colitis. The behavioural approach will usually describe a typical context of anxiety which may be a consequence for both development-related disorders or social miscommunication.

**Treatments:** the specific treatment of the underlying behavioural problem needs a precise clinical approach and tailored behaviour-modification program. The pharmacological approach plays a major role in improving the comfort of the patient and a control for future spontaneous worsening.

In cats, amyttryptilin and SSRIs have been proposed in the treatment of idiopathic cystitis. Pilling a cat is real challenge which may worsen the situation by leading the owners in using coercitive methods. Recent research has emphasized the efficacy of pheromonatherapy with the facial pheromone F3 (Feliway®). In dogs, the control of the digestive signs may be obtained by prescribing some drugs. Neuroleptic products have been widely used in the past, but their severe side-effects may discourage some clinicians and clients. The control of the dopaminergic activity, which seems