Underlying medical conditions in cats with presumptive psychogenic alopecia

Stephen E. Waisglass, DVM; Gary M. Landsberg, DVM, DACVB; Julie A. Yager, BVSc, PhD; Jan A. Hall, BVMS, DACVD

In cats, self-induced alopecia may be a result of an underlying medical disorder or a consequence of displacement behavior arising from environmental and social stressors or situations causing conflict, frustration, or anxiety. Regardless of the underlying cause, self-induced alopecia may progress to a compulsive disorder in cats. Compulsive disorders are those in which the involved behaviors are exhibited independent of the original context and have no apparent goal. They can be repetitive, exaggerated, sustained, or so intense that they might be difficult to interrupt. The rationale for identifying these behaviors as compulsive or obsessive-compulsive is that they resemble compulsive disorders identified in humans, such as repetitive hand washing and impulse-control disorders (eg, trichotillomania), in regard to clinical appearance and response to neuropharmacologic agents. Although the pathophysiology of compulsive disorders is not entirely understood, an underlying alteration in neurotransmitters is a likely factor and pharmacologic intervention is often needed. Alterations in β-endorphins, dopamine, and serotonin have all been implicated in compulsive disorders, primarily on the basis of response to treatment, but abnormal serotonin metabolism has been suggested to be the primary mechanism by which these disorders are induced. In fact, drugs that inhibit serotonin reuptake (eg, clomipramine and fluoxetine) have been shown to be most effective in the treatment of cats and dogs with compulsive disorders and direct evidence of serotonin involvement has been identified.

Self-induced alopecia resulting from an underlying behavioral cause is often referred to as psychogenic alopecia in cats. However, a diagnosis of psychogenic alopecia should made only if primary dermatologic and other medical conditions have first been thoroughly ruled out. Importantly, the response to behavioral treatment in a cat with psychogenic alopecia can be adequately assessed only if an accurate diagnosis has been made. The accepted diagnostic approach begins with obtaining a complete history and performing a thorough physical examination. Minimum additional testing includes cytologic examination of skin scrapings, submission of hair samples for fungal culture, microscopic examination of the hairs, and evaluation of responses to parasiticide treatment and feeding an elimination diet. If results of these tests are negative, then trial treatment with a glucocorticoid may help to differentiate pruritus from behavioral self-trauma because glucocorticoids are unlikely to cause any substantial improvement in cats with a compulsive disorder. In some instances, lime sulfur dips may be recommended to rule out other parasitic diseases, such as Demodex gatoi infection. Urinalysis and hematologic and biochemical testing, including evaluation of thyroid gland function, are used to rule out metabolic disorders, such as hyperthyroidism, hyperadrenocorticism, and diabetes mellitus, and conditions that can cause pain and discomfort, such as urinary tract disease.

From the Dermatology and Behavioural Referral Service of the Doncaster Animal Clinic, 99 Henderson Ave, Thornhill, ON L3T 2K9, Canada (Waisglass, Landsberg); Yager-Best Veterinary Surgical Pathology, Ste A210, 490 York Rd, Guelph, ON N1E 6V1, Canada (Yager); and the Department of Clinical Studies, Ontario Veterinary College, University of Guelph, Guelph, ON N1G 2W1, Canada (Hall, Waisglass).

Supported by Eli Lilly & Company. Feline z/d low allergen diet used in the study was supplied by Hill’s Pet Nutrition Incorporated. Revolution and Depomedrol used in the study were supplied by Pfizer Animal Health. Revolution and Depomedrol were supplied by Hill’s Pet Nutrition Incorporated. Hill’s Pet Nutrition Incorporated. Pfizer Animal Health.

Address correspondence to Dr. Waisglass.
Skin biopsy is typically required for the diagnosis of psychogenic alopecia in cats.8,9 It is expected that skin biopsy specimens from cats with psychogenic alopecia will be histologically normal. Thus, any indication of inflammation, even the presence of rare eosinophils, is taken as an indication that the cat does not have psychogenic alopecia.8,9

Although a comprehensive medical approach is required to make a definitive diagnosis of psychogenic alopecia in cats, economics and owner compliance may limit testing in some instances, so that a presumptive, rather than a definitive, diagnosis is made. Because of this, we suspect that veterinarians may accidentally misdiagnose some cats as having psychogenic alopecia when in fact they have some other disorder. The purpose of the study reported here was to determine the proportion of cats referred by veterinarians in private practice to a specialist in animal behavior with a presumptive diagnosis of psychogenic alopecia that in fact had some other medical condition.

Materials and Methods

Sequential cases involving cats referred for examination by a veterinary behaviorist in which a presumptive diagnosis of psychogenic alopecia had been made by the referring veterinarian were considered for inclusion in the study. Individual cats were included in the study if they had a pattern of hair loss consistent with excessive licking or grooming (ie, regional alopecia or hypotrichosis or regions of broken or overtrimmed [barbered] hairs) that had been present continually for at least 6 months, as reported by the caregiver. Cats that had evidence of parasites, primary skin lesions, a facial or neck distribution of lesions, or an obvious recurrent seasonal history of lesions were excluded. Cats found to have any medical condition or dietary requirement in which glucocorticoid therapy (ie, regional alopecia or hypotrichosis or regions of broken or overtrimmed [barbered] hairs) that had been present continually for at least 6 months, as reported by the caregiver. Cats that had evidence of parasites, primary skin lesions, a facial or neck distribution of lesions, or an obvious recurrent seasonal history of lesions were excluded. Cats found to have any medical condition or dietary requirement in which glucocorticoid therapy (ie, regional alopecia or hypotrichosis or regions of broken or overtrimmed [barbered] hairs) that had been present continually for at least 6 months, as reported by the caregiver. Cats that had evidence of parasites, primary skin lesions, a facial or neck distribution of lesions, or an obvious recurrent seasonal history of lesions were excluded. Cats found to have any medical condition or dietary requirement in which glucocorticoid therapy was contraindicated, or selamectin administration or feeding of a special diet could potentially be detrimental were also excluded. Finally, cats were included only if the caregiver was willing to comply with the diagnostic protocol; agreed to avoid all elective medical procedures (other than vaccination and parasite control) during the course of the study, as such procedures could have had an effect on behavior; and agreed to maintain the same feeding schedule and avoid any changes to the household or the cat's routine for the duration of the study.

For all cats examined because of possible psychogenic alopecia, a detailed behavior and dermatologic questionnaire was completed by the primary caregiver and a behavioral evaluation was performed by a veterinary behaviorist (GML). Candidate cats were then referred for dermatologic evaluation (SEW). Complete physical and dermatologic examinations were performed, including anal sac expression, and the cat was closely examined for evidence of external parasites. Cats with evidence of parasitic infestation or with primary dermatologic lesions (eg, papules or pustules) were treated and removed from the study until such time as the lesions resolved. If the lesions resolved and the overgrooming persisted, these cats were included in the study. Hair loss (ie, alopecia, broken hairs, and thin coat) was recorded as localized or generalized. Documentation of hair loss was obtained by means of digital photography and measurement of alopecic and hypotrichotic patches.

For all cats included in the study, hairs were examined microscopically to assess the condition of the hair and the stage of the follicle and to look for evidence of self-trauma versus epilation; skin scrapings were submitted for cytologic examination; hairs were collected by use of a toothbrush technique and then submitted for dermatophyte culture; samples were submitted for hematologic and serum biochemical testing (including determination of serum total thyroxine concentration), urinalysis, and testing for FeLV and FIV infection; and a fecal sample was submitted for testing with centrifugation and concentration techniques.9 Punch skin biopsy specimens (6 mm in diameter) were collected following local anesthesia with 2% lidocaine. Specimens were placed in formalin and routinely processed for histologic examination. Sections stained with H&E were evaluated by a veterinary behaviorist in which a presumptive diagnosis of psychogenic alopecia that in fact had some other medical condition.8,9

Results

Twenty-five cats were enrolled, but 4 of these did not return for follow-up examinations and, thus, were removed from the study because a definitive diagnosis could not be made. In the remaining 21 cats included in the study, a definitive diagnosis was made. Of the 21 cats included in the study, 13 were spayed females and 8 were castrated males. Six were purebreds or known mixes of purebred cats; the remainder were domestic shorthair or domestic long-hair mixed-breed cats. All but 3 cats had had alopecia for 3 to 13 months.

A medical condition associated with pruritus was identified in 16 of the 21 (76%) cats, with 11 of the 16 having multiple medical conditions. Conditions identified in these cats included concurrent adverse food reaction and atopy (n = 5); adverse food reaction (4); hypersensitivity of undetermined cause (2); concurrent adverse food reaction, atopy, and flea allergy dermatitis (1); atopy (1); parasitic dermatosis (ie, clinical response to parasitic administration; 1); parasitic dermatosis...
and bacterial dermatitis (1); and parasitic dermatosis and hyperthyroidism (1). Adverse food reactions were identified in 12 of the 21 (57%) cats, and in an additional 2 cats, we were unable to confirm an adverse food reaction because the caregivers were unwilling to perform the provocative dietary testing. In 3 of the 21 (14%) cats, a compulsive component was identified in addition to a medical condition (atopy in 1 cat, adverse food reaction in 1 cat, and concurrent atopy and adverse food reaction in 1 cat). In only 2 of the 21 (10%) cats was hair loss determined to be entirely psychogenic. Caregivers for both cats consulted with the veterinary behaviorist after the study was completed, and in both cats, the alopecia improved dramatically with a combination of behavioral management (primarily consisting of a more predictable daily routine with attention to increasing enrichment through social play sessions and introduction of new play toys) and clomipramine treatment (0.5 mg/kg [0.23 mg/lb], PO, q 24 h). One of these 2 cats also had hyperesthesia (ripping skin), which improved dramatically with clomipramine administration and behavioral management. Of the 3 cats with partial psychogenic alopecia, 1 responded to behavioral management, 1 was lost to follow-up, and 1 was not treated.

Skin biopsy specimens were obtained from 20 of the 21 cats, and 14 of the 20 (70%) had inflammatory skin lesions. The pattern of inflammation ranged from superficial dermatitis to periadnexal dermatitis to deep perivascular dermatitis with variable intense dermal edema, congestion, and inflammatory cell infiltration. In 8 (40%) cats, the inflammation was eosinophilic. In the remainder, it was lymphocytic and involved mast cells. In 1 cat, the inflammation was neutrophilic, and this cat had secondary bacterial dermatitis. All cats with histologic evidence of inflammation had a medical condition associated with pruritus (ie, adverse food reaction, atopy, parasitic dermatosis, bacterial dermatitis, hyperthyroidism, or a combination of these). No histologic abnormalities were seen in skin biopsy specimens from the remaining 6 cats. Of these 6 cats, 2 had a compulsive disorder and 4 had an adverse food reaction, atopy, or both. Skin biopsy was not performed in 1 cat because chemical restraint would have been required and the caregiver did not grant permission. This was the cat with concurrent adverse food reaction, atopy, and flea allergy dermatitis.

Discussion

Although the incidence of psychogenic alopecia in cats is unknown, we hypothesized that the condition is overdiagnosed. It is a simple task to identify environmental stressors as potential sources of anxiety, conflict, or frustration, but these may be easily misconstrued as initiators of a behavioral disorder. Our findings support the need for thorough diagnostic testing before ascribing a behavioral cause to hair loss in cats. Importantly, one cannot properly assess response to behavioral therapy without thorough diagnostic testing to eliminate medical causes.

Cats with psychogenic alopecia most commonly traumatize easily reached areas, such as the medial aspects of the forelimbs and thighs, caudal aspect of the abdomen, and inguinal region. Dorsal aspects of the lumbar, sacral, and tail areas can also be affected. Because these regions are commonly affected in cats with many other diseases, the diagnosis of psychogenic alopecia is one of exclusion.

The standard diagnostic testing protocol for all patients in the present study included cytologic examination of skin scrapings, fungal culture of hairs, evaluation of responses to parasiticides and an exclusion diet, and assessment for atopy and endocrinopathies. Skin biopsy is recommended for the diagnosis of psychogenic alopecia and was performed as well. In previous reports of cats with psychogenic alopecia, thorough diagnostic testing for all patients was clearly lacking. Although it might be argued that a response to psychotropic drugs might be used to confirm that a cat had a psychogenic disorder, many of these drugs have antihistaminic effects. In addition, as with most drug trials, there may be undetermined reasons for improvement, such as a placebo effect, other unidentified treatments, and seasonal or diet changes.

Cats were included in the present study only if hair loss had been continually present for at least 6 months. Even so, it is possible that a seasonal change could have coincidentally led to an improvement in clinical signs in some cats. However, this was considered unlikely in the present study because in all but 3 cats, the condition had been present for >13 months. None of these patients were treated with glucocorticoids, and none had had a relapse when follow-up information was obtained 18 months after completion of the study. Therefore, seasonality did not appear to play a role.

Results of our study support the hypothesis that psychogenic alopecia is overdiagnosed. One reason for this may be that complete diagnostic testing can be quite costly. Financial constraints were not a concern in the present study because the cost of diagnostic testing was covered by the study. In addition, we selected cats owned by a dedicated population of caregivers who were willing to travel to a referral center to obtain a diagnosis. In fact, the poorest compliance was seen among those owners for whom the facility also served as a primary care center. Veterinarians may be tempted to make a presumptive diagnosis of psychogenic alopecia simply because primary lesions are absent, but as was found in the present study, one cannot eliminate a medical cause just because there are no primary lesions.

In the present study, we found that it was critical to consider the possibility that the underlying cause of the hair loss was multifactorial because most cats had multiple medical disorders. This concurs with results of a previous study, in which 35% of the cats had concurrent flea allergy dermatitis and atopy. It has been suggested that at least 20% to 30% of dogs and cats with adverse food reactions have concurrent hypersensitivity. In the present study, 7 of 12 cats with an adverse food reaction appeared to have concurrent hypersensitivity, as clinical signs improved following administration of methylprednisolone acetate.

Cats in the present study in which clinical signs responded to glucocorticoid administration were considered to have atopy if all other potential causes had
been ruled out. It is possible that these cats had some other disorder causing pruritus that was responsive to glucocorticoid administration. Nevertheless, the response to glucocorticoid administration was taken as evidence that psychogenic alopecia could be ruled out.

The present study was complicated by the fact that for both atopic dermatitis and psychogenic alopecia, the diagnosis is made by excluding all other possible causes of clinical signs. The challenge of differentiating self-trauma secondary to pruritus from self-trauma secondary to a behavioral disorder was a difficult one from the study’s inception. Specific allergen testing was not performed because such testing is most useful in determining the allergens to which an atopic patient is sensitive, and results cannot be used to prove that atopy is the cause of overgrooming behavior. Because a cat with pruritus could have normal intradermal or in vitro allergen test results and a cat with compulsive behavior could have positive test results, we decided to use response to glucocorticoid administration as an indicator of pruritus. An injectable glucocorticoid preparation was used to eliminate complications associated with administration of an oral preparation.

One could argue that improvements noticed in some cats following glucocorticoid administration were a result of behavioral effects of the drug, in that psychological effects, such as euphoria, depression, hallucinations, mania, and psychosis, have been identified in human patients. Such effects, however, are poorly documented in cats, and it is equally or more likely that glucocorticoids would cause aggression and fear behavior, as has been reported in dogs, although evidence of this was not seen in the present study. Regardless, we cannot rule out the possibility that cats in which clinical signs improved following glucocorticoid administration were responding because of behavior- or mood-altering effects of the drug.

One could also contend that cats with atopy could respond to clomipramine because of its antihistaminic effects and that some cats with atopy do not respond to glucocorticoid administration. We believe that the response to clomipramine in the 2 cats in the present study with uncomplicated psychogenic alopecia supports the diagnosis, in that it would be unlikely that these cats had atopy that was responsive to clomipramine but did not have any improvement in clinical signs following administration of 2 doses of methylprednisolone acetate. One of the 3 remaining cats with psychogenic alopecia and another disorder responded to behavioral treatment. Unfortunately, we were unable to evaluate response to behavioral treatment in the other 2 cats. However, we believe it is unlikely that they solely had pruritus that was incompletely responsive to glucocorticoid administration.

In many of the patients in the present study, diet played an important role in clinical signs, emphasizing how important testing for an adverse food reaction is in cats suspected to have psychogenic alopecia. Cats can often become fixated on a particular diet and resist change, making dietary testing difficult. Nevertheless, properly performed dietary testing is important, particularly because results of histologic examination of skin biopsy specimens were normal for some cats with adverse food reactions in the present study.

Histologic examination of skin biopsy specimens has been considered useful or even necessary in the diagnosis of psychogenic alopecia in cats on the basis of the assumption that there will be no substantial evidence of inflammation in patients that are overgrooming for behavioral reasons alone. In contrast, findings in the present study suggest that skin biopsy may not be helpful in diagnosing psychogenic alopecia, in that only 2 of the 6 cats without histologic abnormalities were ultimately determined to have psychogenic alopecia. Of the remaining 4 cats, 1 had atopy, 1 had an adverse food reaction, and 2 had both atopy and adverse food reactions. Therefore, a lack of inflammatory lesions in skin biopsy specimens cannot be used to confirm a diagnosis of psychogenic alopecia.

In contrast, histologic examination of skin biopsy specimens may be helpful in eliminating a diagnosis of psychogenic alopecia. It has been stated that the presence of even a few eosinophils in the dermis can be used to rule out psychogenic alopecia, and our findings support this suggestion, in that all cats with histologic evidence of inflammation in the present study were subsequently found to have a medical condition. However, if the response to medical treatment is incomplete, concurrent psychogenic alopecia might still be a consideration. Indeed, in the 3 cats in the present study in which psychogenic alopecia was diagnosed along with a medical condition, mild histologic abnormalities were seen in skin biopsy specimens.

Genetic factors may affect the expression of displacement and compulsive behaviors in certain cat breeds. For example, psychogenic alopecia has been reported to be more common in the Oriental breeds. Interestingly, 3 of the 5 cats with psychogenic alopecia in the present study were Oriental breeds or their crosses. Alternatively, Siamese and their crosses may also be predisposed to adverse food reactions, which might have a similar pattern of hair loss, further complicating the diagnostic process.

The relationship between behavior and medicine may also be more complicated than at first glance. The working hypothesis for the pathogenesis of atopic dermatitis in dogs suggests that in the acute phase, a putative epidermal barrier defect could facilitate the contact of environmental allergens and microbes with epidermal immune cells at skin sites. Interestingly, a link has been found between stress and an increase in epidermal permeability.

It has also been suggested that stressful conditions may potentiate pruritus through a variety of mechanisms, including changes in cytokine and hormone profiles and the release of opioids and serotonin as well as various other vasoactive peptides. On the other hand, medical conditions that lead to pruritus might also trigger excessive licking. Over time, there may be alterations in neurotransmitters and their receptors, leading to the development of a compulsive disorder in which the behavior persists even after the pruritus has resolved. However, in the 16 cats in the present study in which medical causes were identified, treatment of the underlying medical condition alone resulted in resolution of the clinical signs. In these patients, there was no evidence of a compulsive behavior.
References


