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Case Report

Successful Treatment with Dexamethasone of a Cat with Suspected Feline Atopic Skin Syndrome Not Responding to Prednisolone

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ABSTRACT

A 6-year-old client-owned indoor, female neutered Persian-exotic shorthair cat was presented for further investigation of severe itchy lesions on the head and neck to our polyclinic. The patient had previously been applied selamectin and a cleansing, soothing, and protecting shampoo, but did not respond positively to the treatment. After the exclusion of ectoparasite infestation, retroviral infection, neoplastic and psychogenic causes, and food allergy, a suspect diagnosis of FASS in the cat was made. Although skin lesions clearly improved, the intensity of pruritus did not reduce during the 4-week prednisolone therapy. Based on these results, the case was considered to be resistant to prednisolone. Treatment with dexamethasone provided a fast and complete recovery of clinical signs and the cat has been clinically healthy maintained for over 2-years. This study suggests that oral dexamethasone can be a good alternative for treating cats with suspected FASS that has not responded positively to prednisolone therapy.

Keywords: *FASS, therapy, prednisolone, resistance, dexamethasone.*

Prednizolona Yanıt Vermeyen Atopik Deri Sendromu Şüpheli Bir Kedinin Deksametazon ile Başarılı Tedavisi

ÖZET

Altı yaşlı, ev ortamında barındırılan, kısırlaştırılmış dişi İran egzotik ırkı kedi kafa ve boyunda şiddetli kaşıntılı deri lezyonlarının ileri değerlendirmesi için kliniğimize getirildi. Bu hastada önceki salemektin ve temizleyici, yatıştırıcı ve koruyucu içeren bir şampuan uygulamasından olumlu sonuç alınmadığı bildirildi. Ektoparazit enfestasyonu, retroviral enfeksiyon, neoplastik ve psikojenik nedenler ile gıda alerjisi dışlandıktan sonra kediye FASS şüpheli tanısı konuldu. Dört haftalık prednizolon tedavisi sırasında deri lezyonlarında belirgin bir düzelme olmasına karşın kaşıntının şiddeti azalmadı. Bu sonuçlara göre olgunun prednizolona dirençli olduğu düşünüldü. Deksametazon tedavisi, klinik belirtilerin hızlı ve tam olarak iyileşmesini sağladı ve kedi, iki yılı aşkın bir süredir klinik olarak sağlıklı bir şekilde korunuyor. Bu çalışma, oral deksametazonun, FASS şüphesi olan ve prednizolon tedavisine olumlu yanıt vermeyen kedileri tedavi etmek için iyi bir alternatif olabileceğini düşündürmektedir.

Anahtar Kelimeler*: FASS, tedavi, prednizolon, direnç, deksametazon.*

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Introduction

Feline Atopic Skin Syndrome (FASS), previously defined as feline atopy or "non-flea, non-food hypersensitivity dermatitis (NFNFHS)," is an inflammatory and pruritic skin syndrome manifested by a series of reaction patterns associated with IgE antibodies against environmental allergens (Favrot et al., 2012; Halliwell et al.,2021a; Halliwell et al., 2021b; Santoro et al., 2021). These reaction patterns include miliary dermatitis, self-induced alopecia/hypotrichosis, eosinophilic granuloma complex, and/or excoriation-ulcers in the head and neck (Santoro et al., 2021).

The syndrome is one of the most skin diseases among cats with a prevalence of 20% (Hobi et al., 2011), and its management can be challenging (Scott et al., 2001; Favrot et al., 2012; Mueller et al., 2021; Santoro et al.,2021). In comparison with dogs and humans, intradermal skin tests and serological allergy tests used for the diagnosis of FASS in cats are currently not sufficient due to the undefinition of the types and concentrations of allergens (Miller et al.,2013; Santoro et al.,2021). Allergy tests only support the clinical diagnosis and guide for Allergen Specific Immunotherapy (ASIT) treatment. Therefore, the definitive diagnosis of FASS is based mainly on history, clinical signs, and the exclusion of appropriate differential diagnoses for each case (Miller et al.,2013; Santoro et al.,2021). Treatment of FASS consists of managing pruritus while identifying and addressing aetiological factors. A patient-specific "Multimodal Therapy" is often planned and the severity of the syndrome, the seasonality, the owner and the patient's compliance with the treatment, the cost, and potential side effects should be considered (Mueller et al., 2021). In this context, there are therapy options such as systemic and/or topical glucocorticoids, cyclosporine, oclacitinib, antihistamines, maropitant citrate, essential fatty acids, and palmitoylethanolamide (Mueller et al., 2021).

This report highlights the potential usefulness of oral dexamethasone in a cat suspected FASS resistant to prednisolone therapy.

Case

A 6-year-old, client-owned indoor, vaccinated female neutered Persian-exotic shorthair cat was presented for further investigation of severe itchy lesions on the head and neck. The cat was eating a tuna-based dry food for sterilized cats. No other cat/animal was living in the house. Selamectin topical solution (Stronghold; Zoetis) was applied to the cat every two months for primarily ectoparasite control. According to the owner, severe pruritic lesions, which started with only redness, itching, and hair loss around the ear/eyes and bilateral face area, then spread to the neck, were observed about two months ago. The cat has never experienced any dermatological problems previously. The complaints reported occurred for the first time and did not respond to selamectin (Stronghold; Zoetis) and a cleansing, soothing, and protecting shampoo (Allermyl; Virbac) application in the referred clinic. On physical examination, the patient was awake and sensitive to the environment, and bilateral ulcers and erosions, erythema, epithelial excoriation, and alopecia in the face and neck were observed (Figure 2 A-C). The itching score observed by the owner was noted as 9/10. The cat was normal except for the skin lesions. Additionally, complete blood count and routine serum biochemistry profile were within the reference ranges. Screening for both feline immunodeficiency virus (FIV) antibody and feline leukemia virus (FeLV) antigen with the rapid test kit (Anigen Rapid FIV Ab/FeLV Ag Assay; Bionote Inc) were negative.

Microscopic examination of multiple swab samples taken from the ear canals and superficial/deep scraping specimens taken from the lesions did not reveal any parasitic organisms. Cellophane tape samples taken from all lesions were also negative for ectoparasites (fleas or flea excreta, lice). Large numbers of *Malassezia* spp. were found in a cytological examination of the ear canal and skin samples stained with Giemsa Wright (Figure 1). In skin cytology, intracellular bacteria were identified in neutrophils. There was no evidence of thymoma following the chest radiograph, and no abnormalities were detected on the abdominal ultrasound.

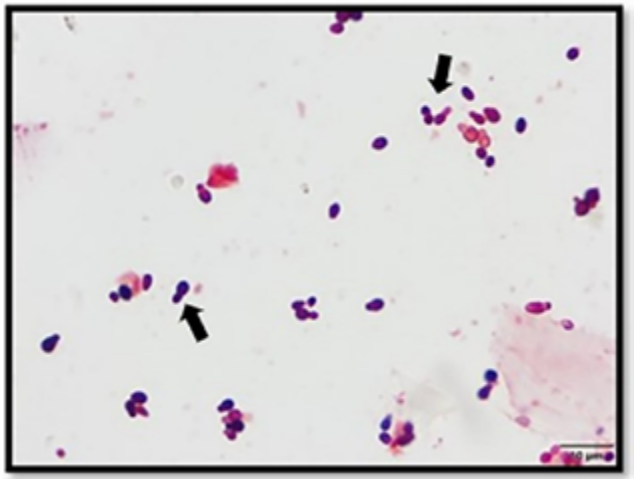

Figure 1: *Malassezia* spp. identified in sterile swab samples taken from the ear canal (arrows).

Although an ectoparasite was not observed in all skin scraping samples, an imidacloprid and moxidectin combination (Advantage Multi; Bayer) was recommended to be applied two weeks apart due to the risk of false negative results and not to ignore the flea allergy dermatitis.

A diagnosis of concurrent bacterial and yeast pyoderma was made based on the clinical and laboratory findings. Cephalexin monohydrate (Maksipor oral suspension; Actavis) at a dose of 22 mg/kg twice a day for 15 days; Saniotic (Richterpharma) ear drop containing miconazole nitrate, polymyxin B, prednisolone acetate, two drops in both ears two times a day for ten days, and Specialist shampoo (Vet Expert) containing ketoconazole and chlorhexidine once a week for a total of 2 applications were

Figure 2: Bilateral erosion and epithelial excoriation of the face (A, B) and alopecia with erosion and epithelial excoriation of the neck (C) at initial presentation. Self-induced alopecia in the right lateral neck (D). Significant improvement in lesions (E, F) after 15 days of treatment. Regrese of hot spots and completion of skin integrity after approximately one month with Elizabethan collar (G, H, I). General clinical appearance and complete resolution of lesions six months after initiation of oral dexamethasone therapy (J).

suggested. Considerable improvement in lesions on the head and neck (Figures 2D-F) was confirmed in the control examination after 15 days of the treatment, whereas no change in the level of itching was observed. The patient continued to have self-induced alopecia in the head and neck, and new lesions were also emerging. Control cytology revealed that the ears are clean and bacterial dermatitis on the skin has regressed noticeably. Oral application of cephalexin was continued for one week, and Elizabethan collar was advised to prevent the licking, chewing, or scratching of wounds. In the control examination, regression of skin lesions on the head and neck continued, but the pruritus in similar intensity lasted as soon as the Elizabethan collar was removed.

Upon this observation, both food allergy and/or atopy could be the cause of pruritis. An elimination diet containing a hydrolyzed protein source (Royal Canin Hypoallergenic for cats), which would last 8-12 weeks, was started. At the end of this trial, however, no regression in self-induced alopecia and no change in the pruritus score were recorded. In this way, food allergy was eliminated as the cause of itching, and the history, clinical findings, and diagnostic testing made the diagnosis of FASS most likely. Considering the severity of attacks and reaction patterns, methylprednisolone (Prednol tablet; Gensenta at dose of 1 mg/kg PO q12h) was administrated concurrently with essential fatty acids (Bio Pet Active Opti Biomega Omega 3-6; 500 mg/cat of Omega 6 fatty acids, and 250 mg/cat of Omega 3 fatty acids) and topical Sudocrem (Teva Pharmaceutical Industries) containing zinc oxide, sodium benzoate, and butylated hydroxy anisole until the lesions and pruritus reduce. The dose of methylprednisolone gradually was decreased and discontinued over a 4-week period. At the end of this period, the lesions on head and neck clearly improved, but self-scratching was still manageable with just an Elizabethan collar (Figures 2G-I). Based on this treatment result, we supposed that the syndrome is resistant to prednisolone treatment and oral dexamethasone at a daily dose of 1.5 mg/cat (approximately 0.4 mg/kg) initial treatment was started. The owner reported the complete disappearance of itch in the cat within three days of starting the treatment. After seven days, the dose was tapered to 1 mg/cat per day (approximately 0.3 mg/kg) for 7 days, to 0.75 mg/cat (approximately 0.2 mg/kg) daily for the next three months, and 0.5 mg/cat was continued for six months every other day as previously reported (Rzeszutek, 2020). The cat was clinically healthy (Figure 2J), and routine haematological and biochemical parameters analyzed six months after the beginning of dexamethasone therapy were within the reference ranges, except for stress leukogram and mild hyperglycaemia. No recurrence was observed in the two-year follow-up at six-month intervals. The cat's clinical views before and during treatment were presented in Figure 2.

Discussion

Diagnosis in patients with suspected FASS is based on history, clinical signs, and exclusion of appropriate differential diagnoses for each case. The primary dermatological problem of the cat presented here was pruritus; therefore, the most likely differential diagnoses included: fleas or flea allergy dermatitis, cheyletiellosis, demodicosis, dermatophytosis, neoplastic and psychogenic causes, food allergy, and atopy (Favrot et al., 2012; Favrot, 2013). Skin diseases associated with both two immunosuppressive feline viruses, FIV and FeLV, enclose bacterial skin infections, nonhealing wounds, exfoliative dermatitis, generalized pruritus, dermatophytosis, demodicosis, and others (de Mello et al., 2023). Because the cat in this study was FIV and FeLV negative, immunosuppression related to both feline viruses did not come in question. The possibility of parasitic infestations and flea allergy dermatitis was ruled out due to multiple negative skin scrapes and a lack of response to empirical treatment with selamectin for fleas and/or mites. Similarly, dermatophytosis can be eliminated based on negative results of impression smears. Chest radiography, abdominal ultrasound, and blood analysis helped also to rule out paraneoplastic cutaneous syndrome that may occur due to thymoma, pancreatic neoplasia, and/or gallbladder carcinoma (Pascal-Tenorio et al., 1997; Turek, 2003; Rottenberg et al., 2004). There were no environmental changes, such as construction, remodeling, moving, or introduction of a new pet or person into the household for the presumed cause of psychogenic pruritus in our case. Yeast and bacterial pyoderma are possible causes of pruritus, but they are most likely to be secondary to another underlying disease (Hobi et al., 2011; Santora et al., 2021). The topical and systemic therapy for *Malassezia* and bacterial pyoderma in the cat presented here resulted in a noticeably regression of skin lesions on head and neck, but pruritus lasted without change in its intensity. For this reason, concurrent yeast and bacterial pyoderma can most likely be evaluated as secondary to another underlying disease. There was also no regression in self-induced alopecia and the pruritus score during the elimination diet so food allergy as the cause of the complaints in our case was ruled out.

Based on all the results of the case mentioned above, FASS was suspected. The treatment of FASS can take a long time, and management can be complicated. While planning treatment and management, the severity of the syndrome, seasonality, patient and patient adherence to treatment, cost, and potential side effects should be assessed (Mueller et al., 2021). The treatment with systemic methylprednisolone as recommended first option for FASS has been started under consideration of these conditions. The treatment trial with methylprednisolone in our case did not provide full resolution of skin lesions, and self-scratching was still persistent. As previously reported in a case resistant to prednisolone by Rzeszutek (2020), drug resistance was considered due to the inability to obtain a satisfactory response. In this context, cyclosporine or oclacitinib could be primarily considered as an alternative treatment option (Mueller et al., 2021).

Nevertheless, an oclacitinib-containing drug is not available in our country, and cyclosporine drugs are expensive. Therefore, dexamethasone due to its easy availability and the lower cost was tried to treat presumed FASS in the cat. In accordance with a previous case report on resistant to prednisolone but responsive to dexamethasone treatment (Rzeszutek, 2020), a fast and long-time complete improvement without significant adverse effects and recurrence in a two-year observation period was achieved in our case. The response difference between methylprednisolone treatments versus dexamethasone for FASS in our case can firstly be explained by differences in glucocorticoid activity and biological half-life. Dexamethasone has a more potent glucocorticoid activity and a longer biological half-life (24-72 h) as compared to 12-36 h of methylprednisolone (Lowe et al., 2008). Therefore, dexamethasone can be expected to have a greater anti-inflammatory and immunosuppressive effect as compared to methylprednisolone for FASS treatment. Studies showed that dexamethasone may lead to more diabetogenic side effects than methylprednisolone in cats (Lowe et al., 2009). However, except for stress leukogram and mild hyperglycaemia, oral dexamethasone therapy with the above-mentioned protocol applied to the patient did not result in significant changes in clinical, haematological, and serum biochemical profiles, and none of the adverse effects warranted intervention. This condition can be explained by the fact that cats appear to tolerate glucocorticoids well (Lowe et al., 2008).

Conclusion

In conclusion, dexamethasone can be used successfully in FASS that does not respond to prednisolone therapy.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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