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Innovative Nutraceutical Approach in the Treatment of Chronic Gingivostomatitis: Insights Gained from the Case

Kronik Gingivostomatitis Tedavisinde Yenilikçi Nutrasötik Yaklaşım: Vakadan Öğrenilenler

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ABSTRACT

A nine-year-old female domestic shorthair cat presented with lethargy, anorexia, recurrent severe oral lesions, and oral pain. The cat was diagnosed with feline chronic gingivostomatitis (FCGS) associated with feline Immunodeficiency Virus (FIV) infection, based on clinical signs and serological testing.. Management was followed with a nutraceutical supplement including primarily iodine and arginine. Over a 2.5-month period, significant clinical improvements were observed, including resolution of oral lesions, increased appetite, and improved activity levels. This case report highlighted the potential role of nutraceuticals as a treatment regime for managing FCGS in FIV-positive cats, particularly in cases resistant to traditional treatments.

Keywords: Arginine, Cat, Iodine, Stomatitis

ÖZ

Dokuz yaşında, dişi, evcil bir kedi, halsizlik, anoreksi, tekrarlayan şiddetli ağız lezyonları ve ağrı şikâyeti ile başvurdu. Kediye, Kedi İmmün Yetmezlik Virüsü (FIV) enfeksiyonu ile ilişkili Kedilerde Kronik Gingivostomatit (FCGS) tanısı serolojik analizler ve klinik bulgular temelinde konuldu. Hastada başlıca iyot ve arjinin içeren bir nutrasötik takviye başlandı. 2,5 aylık bir süre zarfında, ağız lezyonlarının çözülmesi, iştahın artması ve aktivite artışı ile önemli klinik iyileşme gözlemlendi. Bu olgu sunumu, özellikle geleneksel tedavilere dirençli vakalarda, FIV-pozitif kedilerde FCGS yönetimi için nutrasötiklerin potansiyel bir tedavi yöntemi olarak rolünü vurgulamaktadır.

Anahtar Kelimeler: Arjinin, Kedi, İyot, Stomatitis

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INTRODUCTION

Feline chronic gingivostomatitis (FCGS) is a complex and debilitating inflammatory mucosal disease that affects up to 26% of domestic cats. This condition, which causes severe oral pain, can become potentially life-threatening in at least 10% of cases.[1] The pathogenesis of FCGS remains unclear, and may involve various factors, including infectious agents such as feline immunodeficiency virus (FIV)[2]. Especially related viral infection are suspected to play a role in FCGS due to their association with increased prevalence in cats.[3] One proposed mechanism is that immune dysregulation disrupts the oral microbiome, thereby facilitating pathogenic colonization.[2]

The primary etiology of FCGS remains poorly understood, and a consistent and effective treatment approach has yet to be established. In recent years, various therapeutic strategies have been explored, typically categorized into medical and surgical methods.[4] Medical treatments often involve immunosuppressive therapies, with agents such as corticosteroids and cyclosporine being commonly utilized.[4] On the other hand, surgical interventions primarily focus on the extraction of premolar and molar teeth or, in some cases, all teeth to manage the condition effectively.[5] Additionally, the incorporation of L-arginine as part of therapeutic strategies has been considered due to its established immunomodulatory and wound-healing properties. L-arginine is a precursor to nitric oxide, a molecule crucial for immune response and tissue repair, and its metabolism is directly linked to the regulation of pro-inflammatory and anti-inflammatory pathways. This dual regulatory role is particularly relevant in chronic inflammatory conditions such as feline chronic gingivostomatitis, where immune dysregulation plays a significant role.[6] While the exact circulating levels of L-arginine in affected cats remain unmeasured, its supplementation aims to restore immune homeostasis and promote mucosal healing, thereby offering a complementary approach to traditional therapies.[7]

The aim of this case report is to evaluate the clinical effectiveness of a nutraceutical supplement with some essential amino acids and rich herbal composition in the management of FCGS in FIV-positive cat, with a focus on its impact on oral lesion healing, and overall quality of life.

CASE PRESENTATION

On May 19, 2024, a nine-year-old, 3.5 kg female domestic shorthair cat was admitted to the Veterinary Clinic of Aydın Adnan Menderes University. The cat presented with a history of weight loss, reduced water and food intake, and severe oral pain and inflammation as the primary complaints. The owner reported a history of advanced periodontal disease and a clinical suspicion of gingivostomatitis complex, as well as intermittent corticosteroid use over the past two years. The owner also stated that prednisolone treatment had significantly improved oral inflammation but did not result in complete resolution. To identify potential risks in the anamnesis, it was noted that the cat had indoor-outdoor access, lacked a vaccination history, but was regularly dewormed and had contact with other cats. On physical examination, the vital findings of cat were within normal limits; however, significant pain and resistance were noted during oral cavity examination. Generalized hyperemia in the alveolar mucosa, caudal oral mucosa, and palatoglossal folds, along with spontaneous bleeding were identified. Laboratory tests were conducted, including biochemical analysis and a complementary FIV Ab/FeLV Ag/FCoV Ab immune assay (Feline 3D, Bionote, South Korea). The cat tested positive for FIV but calicivirus elimination could not be performed. Initial laboratory results revealed globulin at 5.5 g/dL (reference range: 2.8–4.4 g/dL), an albumin/globulin ratio of 0.6 (reference range: >0.8), ALP at 137 U/L (reference range: 20–110 U/L), and serum amyloid A at 1667 U/L (reference range: 500–1500 U/L). To evaluate lesion severity and treatment response, scoring systems including the Caudal Stomatitis Intensity Score (CSIS),[8] Owner Disease Activity Index (ODAI),[9] and Disease Activity Index (DAI)[10] were applied.

Histopathological evaluation of lesions was not performed. Medications were prescribed to facilitate a follow-up oral cavity examination, but the owner did not return for the follow up monitoring. The patient returned 2.5 months later, with the owner reporting mild improvement in oral lesions with the prescribed medications. However, symptoms persisted, and the owner independently discontinued the medications, replacing them with corticosteroids for two weeks, which yielded no improvement. After that the owner only applied for a nutraceutical supplement provided by us (Petclinique Metabolique, Petclinique, Türkiye) for 1 month without consultation. This supplement contained primarily iodine, Chromium, L-arginine, L-taurine, and natural ingredients such as Gymnema sylvestre, turmeric, ginger, cayenne pepper, garlic, fenugreek, cinnamon, dandelion, and potassium iodide. The supplement had been prescribed at a dosage of half a tablet twice daily.

At the second consultation 2.5 months of the first initiation, the owner was enrolled to clinic with the mild recurrence of oral lesions following stress. The owner reported a gradual improvement in appetite, resumption of solid food intake, increased activity, and complete resolution of oral lesions during the administration of nutraceutical supplement and after completing the supplement, the clinical improvement remained stable for one month. However, mild oral lesions reappeared following stress exposure caused by a new environment and contact with another animal.

Upon examination, mild localized lesions were observed in the alveolar mucosa and upper palate. Clinical scoring revealed improvement compared to initial findings, even during this mild recurrence. After one additional week of treatment with the supplement, the lesions resolved completely, and the cat was deemed stable (Figure 1, Table 1).

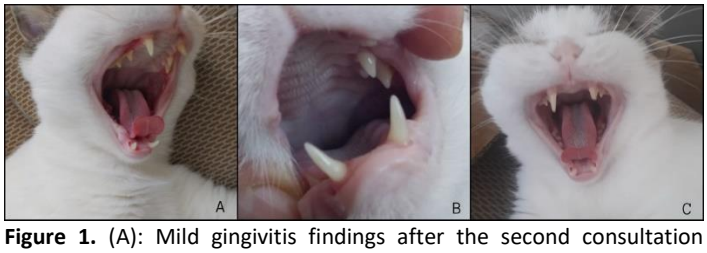

Figure 1. (A): Mild gingivitis findings after the second consultation (before) (B): Improvement of the lesion in the first week following supplement administration (after) (C): The lesion significantly improved one month after supplement, with the mucosa nearly resembling healthy oral tissue (after).

Table 1. Oral lesion scores pre- and post- treatment

Stomatitis Scores	Pre-Treatment	Post-treatment		
		After 1 week of the second consultation (After 2.5 months of the first initiation)		After 1 months of the second consultation
CSIS	2	0.5	0.25	0
ODAI	7	0	0	0
DAI	14	3	2	0

CSIS: The Caudal Stomatitis Intensity Score, ODAI: Owner Disease Activity Index, DAI: Disease Activity Index.

DISCUSSION

The management of FCGS remains a significant therapeutic challenge due to the lack of a universally effective drug to mitigate the chronic inflammation of oral mucosa and the proliferation of granulation tissue. In this study, we assessed the clinical effectiveness of a commercially available nutraceutical compound in an FIV-positive cat with chronic gingivostomatitis. Notable clinical improvements became evident within seven days of treatment initiation and continued over the subsequent two months, highlighting the potential utility of this approach in managing FCGS.

Comparable outcomes have been observed in a previously reported uncontrolled case study, where an adult cat in the terminal stage of FIV achieved complete recovery within eight weeks following the administration of a commercially available iodine solution. Remarkably, the cat remained free of clinical signs for at least five years post-treatment.[11] This recovery was attributed to iodine's broad-spectrum antimicrobial properties against opportunistic infections and its possible ability to reduce viral load. Retroviral infections such as FIV exhibit a viral load localized predominantly within the reticuloendothelial system, a feature also shared with HIV.[12] Notably, the lipophilic form of iodine has demonstrated significant antiviral and microbiocidal activity.[8] When administered orally, this form of iodine integrates into triglyceride-rich lipoproteins, enabling lymphatic transport to reticuloendothelial cells.[11] This mechanism supports its potential as an effective antimicrobial and antiviral agent, particularly in FIV cases.

L-arginine, a semi-essential amino acid included in the nutraceutical formulation used in this study, likely contributed to the observed clinical improvements. L-arginine is derived either from dietary intake or through the recycling of L-citrulline, itself synthesized from glutamate, glutamine, or proline. Within the urea cycle, L-arginine is metabolized by arginase-1 into L-ornithine and urea. Arginase-1 plays a pivotal role in cellular detoxification, proliferation, and collagen synthesis, linking L-arginine metabolism to inflammatory and wound-healing pathways.[9] The Arg-dependent pathways modulate the balance between pro-inflammatory and anti-inflammatory responses, which is critical during tissue regeneration. Dysregulation of these pathways has been implicated in impaired wound healing and the development of chronic wounds, conditions relevant to FIV-positive cats.[6] The therapeutic focus on L-arginine in this study was due to its well-documented roles in immune modulation, anti-inflammatory pathways, and tissue repair, which are critical in managing chronic inflammatory conditions such as FCGS. While the nutraceutical formulation included multiple bioactive compounds such as L-carnitine, the study primarily aimed to evaluate the clinical potential of L-arginine based on its established biological relevance. It is important to note that L-arginine supplementation was not intended to directly target retroviral infections; rather, it was employed to modulate immune responses and support tissue regeneration. However, the observed improvement

likely resulted from the synergistic effect of multiple components within the formulation rather than the isolated effect of L-arginine alone. The contribution of other components, including L-carnitine, to the observed improvement remains a subject for future investigation. This limitation is acknowledged, and further research should aim to isolate the individual effects of each component within such formulations.

The parallels between FIV and human HIV/AIDS underscore the relevance of these findings. FIV, much like HIV, is a retrovirus that induces immunosuppression through a progressive depletion of CD4+ T-helper lymphocytes, leading to systemic illness, chronic inflammation, and susceptibility to opportunistic infections.[13] Increased arginase-1 activity has been reported in patients with HIV, particularly those with low CD4+ T-cell counts, suggesting a mechanistic similarity between these retroviral diseases.[14,15] Previous studies have demonstrated that supplementation with L-arginine enhances immune responses in cats by promoting leukocyte proliferation and phagocytic activity, effects that may have contributed to the immunomodulation observed in this case.[15] Furthermore, L-arginine supplementation has been associated with increased CD4+ activity and improved immune homeostasis through pathways involving polyamine and collagen synthesis, as well as the maintenance of L-arginine–arginase–NOS balance.[6]

In this case, significant clinical improvement was observed over a 2.5-month period with the exclusive use of the nutraceutical compound, as evidenced by reduced clinical scores. However, the temporary recurrence of lesions suggests that environmental stressors may exacerbate underlying oral conditions in FIV-positive cats. This finding emphasizes the importance of long-term management strategies, including minimizing stress and providing supportive care, to sustain clinical remission.

The results of this study further underscore the association between chronic gingivostomatitis and systemic inflammatory burden in FIV-positive cats. The observed efficacy of the nutraceutical compound, particularly its herbal composition, highlights its potential as an alternative therapeutic approach for treatment-resistant conditions. The use of natural supplements may provide a promising solution for improving the quality of life in affected cats. However, further research, including controlled clinical trials, is warranted to confirm these findings and elucidate the underlying mechanisms of action. The clinical benefits observed in this case likely resulted from the synergistic effect of multiple bioactive compounds rather than the action of a single component, emphasizing the importance of evaluating combination therapies in further investigations. Future studies should focus on the synergistic effects of components such as iodine and L-arginine, which appear to play key roles in immunomodulation and tissue regeneration. By expanding our understanding of these mechanisms, we can optimize treatment strategies for FCGS and similar chronic inflammatory conditions.

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