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REVIEW OF THE MAIN ASPECTS OF SYSTEMIC LUPUS ERYTHEMATOSUS IN SMALL ANIMALS

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ABSTRACT

Objective: The aim of this study is to analyze Systemic Lupus Erythematosus (SLE) in dogs and cats, highlighting its etiology, clinical manifestations, diagnosis, treatment and prognosis. SLE is a complex autoimmune condition, mainly affecting the joint, renal, and skin systems, and its identification is challenging due to the diversity of clinical signs, which may include fever, polyarthritis, skin manifestations, and indications of renal involvement. Diagnosis is made through laboratory tests, including ANA testing and biopsies, in order to detect autoantibodies. Treatment involves the use of corticosteroids and immunosuppressants, although these can increase the risk of infections. In addition, the prognosis of SLE is often poor, especially in cases with renal or hematologic impairment. Neutering is recommended as a preventive measure. This study emphasizes the importance of integrated approaches in veterinary medicine to improve the diagnosis and management of SLE, aiming to provide a better quality of life to affected animals and reinforcing the need for continuous monitoring of patients.

Keywords: Autoimmune Diseases. Pets. Clinical manifestations.

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INTRODUCTION

Systemic Lupus Erythematosus is an immune-mediated, multisystem condition. Its cause is believed to be multifactorial, involving genetic factors, viral infections, immune problems, exposure to ultraviolet radiation, hormonal imbalance, and drug responses (LARSSON C.E. & OTSUKA M, 2000). This rare immune disease can affect both dogs and cats. In addition, clinical manifestations include skin lesions (usually on the face and ears), pain, claudication, polyarthritis, polymyositis, hyperthermia, anorexia, weakness, signs of glomerulonephritis, and mouth ulcers (HOGENESCH, 2014).

Autoimmune skin diseases result from disturbances in the patient's immune system, resulting in the destruction of skin cells by the body itself (VAL, 2006). Through immunological processes, SLE results in the creation of immune complexes that, when installed in the tissues, cause their clinical manifestations, which are more common in the kidneys, joints and skin. The glomeruli suffer damage due to the accumulation of fat. The development of immune complexes can occur, resulting in chronic kidney disease (PATTERSON & HLINICA, 2016). Environmental aspects, contact with infectious agents and the use of medications can facilitate the appearance of SLE (SNYDER, 2013).

The diagnosis of SLE is based on clinical and immunological analyses, as well as histopathology of the skin and kidneys, and the identification of circulating autoantibodies. The goal of treatment is to modulate immunity, starting with the use of corticosteroids and continuing with immunomodulators such as azathioprine, cyclosporine, and cyclophosphamide. The outcome is uncertain, and simultaneous infections are quite common, due to the immunomodulatory treatment to which the animal is exposed (VASSALO, 2011).

LITERATURE REVIEW

ETIOLOGY AND PATHOGENIOLOGY

Systemic Lupus Erythematosus is a common immune-mediated condition in humans, particularly in women in the fertile phase. However, in dogs, the influence of sex on the incidence of the disease is debated. The breeds with the greatest tendency are the Shetland Shepherd, the German Shepherd, the Old English Sheepdog, the Afghanhound, the Beagle, the Collie, the Irish Setter and the Poodle. In felines,

detection is more complex, leading to underreporting of cases. In dogs, the diagnosis usually occurs between 2 and 9 years of age, although it can happen at any age (SCOTT-MONCRIEFF, 2015; SNYDER, 2013)

In humans, the cause of SLE is linked to the consumption of certain medications and sex hormones. In pets, in addition to genetic inheritance, an immune dysfunction destabilizes T lymphocytes, resulting in the formation of autoantibodies. SLE can also be triggered by environmental factors, contact with infectious agents, and medications. For example, in cats, the use of methimazole has been linked to the emergence of antinuclear antibodies, even without showing symptoms of SLE; In dogs, hydralazine has a similar effect. Ultraviolet radiation also intensifies the dermatological manifestations of the disease (SCOTT-MONCRIEFF, 2015; SNYDER, 2013; STONE, 2005).

In SLE, there is the formation of immune complexes that are deposited in the tissues, characterizing a type III hypersensitivity reaction. The disease is seen as multisystemic, characterized by the production of several autoantibodies, such as antinuclear antibodies (ANA), rheumatoid factor, and anti-erythrocyte antibodies. These autoantibodies originate immune complexes that accumulate in the basal membranes of white blood cells, synovial membranes, skin, blood vessels, and other tissues, causing inflammation and tissue damage (PATTERSON & HLINICA, 2016)

CLINICAL SIGNS

Clinical signs of SLE include fever, nonerosive polyarthritis with joint swelling and claudication, cutaneous manifestations (such as alopecia, erythema, ulceration, crusting, and hyperkeratosis, particularly in areas exposed to sunlight), and indications of kidney disease, such as weight loss, nausea, polyuria, and polydipsia, being the most frequent. Usually, the simultaneous existence of three or more clinical signs occurs in advanced situations and is linked to an adverse prognosis. In the more advanced stages, neurological signs such as behavioral changes, proprioceptive problems, and nystagmus may appear due to the participation of the central nervous system. Additionally, changes in laboratory tests often include hemolytic anemia, thrombocytopenia, and leukopenia. In addition, skin lesions are common and changeable, and may include erosions, mucocutaneous ulcers, scaling, erythema, alopecia, and crusts. These injuries usually affect areas such as the face, ears, and

extremities of the limbs. These symptoms are frequent and usually appear and disappear over time, which can delay the diagnosis until owners notice the clinical symptoms and seek veterinary assistance (SCOTT-MONCRIEFF, 2010; STONE, 2005; LATORRE, 2011).

Ultraviolet radiation potentiates skin lesions, and SLE can impact the nasal plane, causing depigmentation, erythema, and desquamation, as well as hyperkeratosis in the pads, resistant secondary bacterial pyoderma, and panniculitis. Polyarthritis is characterized by lethargy, stiffness and problems standing or standing, mainly affecting the intervertebral, carpal and tarsal joints and, in more severe situations, the temporomandibular joint (RHODES, 2003; HOGENESCH, 2005) Other clinical symptoms include petechiae and ecchymoses, resulting from thrombocytopenia or vasculitis. In felines, SLE is less common and presents through fever, glomerulonephritis, dermatitis, and hemolytic anemia, accompanied by lymphadenomegaly, splenomegaly, and polyarthritis when it manifests itself in a generalized form (STULL et al., 2008; CHABANNE et al., 1999).

DIAGNOSIS

To diagnose SLE, it is crucial to perform a series of clinical and laboratory tests, which include blood count, blood biochemistry, urinalysis with protein quantification, as well as specific tests such as the Coombs test, ANA (Antinuclear Antibody) and ANA (Antinuclear Factor) (SCOTT-MONCRIEFF, 2015). The ANA test is seen as the most revealing of SLE, identifying antibodies against DNA, which are present in about 90% of cases of canine SLE, even though some cases may be negative (FORRESTER & LEES, 1995). The ANA test, performed by immunofluorescence, is also used and provides greater accuracy in certain situations (LATORRE, 2015).

Additional tests, such as skin and kidney biopsy, can help differentiate the diagnosis, especially when there is proteinuria associated with glomerulonephritis. Contact dermatitis and depigmentation can be identified on skin biopsies (PALUMBO et al., 2010b; SCOTT et al., 2001). Arthrocentesis is recommended in situations of claudication, showing healthy neutrophils and reduced viscosity of the synovial fluid (HOGENESCH, 2003).

The differential diagnosis encompasses conditions such as ehrlichiosis, multiple myeloma, and bacterial and viral infections. Such conditions should be ruled out through

specific tests, such as serology for rickettsial diseases and PCR for *Ehrlichia canis* (PATTERSON & HLINICA, 2016). Normally, when the animal exhibits two or more main clinical symptoms (fever, polyarthritis, glomerulonephritis, dermatitis, cytopenia) and the ANA test is positive, the diagnosis of SLE is made, enabling appropriate treatment (SCOTT-MANCRIFE, 2015).

TREATMENT

Treatment of SLE aims to control inflammation, reduce immune activity, and prevent progression to chronic kidney disease. The corticosteroid prednisone (1 to 2 mg/kg every 12 hours) is the most commonly used drug, which is progressively tapered after clinical symptoms improve. More severe or resistant cases can be treated with immunosuppressants, such as azathioprine, cyclophosphamide, and cyclosporine, contributing to the reduction of the dose of corticosteroids (SCOTT-MANCRIEFF, 2010).

The therapeutic strategy also encompasses a balanced diet, sun protection and the control of associated conditions, such as hypertension and obesity, using ACE inhibitors for renoprotection. To reduce local inflammation in skin lesions, topical corticosteroids or tacrolimus can be applied. The use of non-steroidal analgesics or anti-inflammatory drugs to relieve joint pain is limited due to the danger of side effects, such as gastric ulcers (BORBA et al., 2008; GRAUER, 2010; HOGENESCH, 2003).

It is crucial to regularly monitor blood counts and serum biochemistry to tailor treatment, considering the continued use of immunosuppressants and the risk of secondary infections. Animals that show joint or skin signs generally respond more effectively to treatment, while those that show hematological changes may require more intensive treatment (GERONYMO et al., 2005; SCOTT et al., 2001).

PROGNOSIS

The prognosis of Systemic Lupus Erythematosus (SLE) in small animals, in most cases, is considered unfavorable, with frequent relapses, regardless of therapy. Immunosuppressive therapy, often necessary long-term or lifelong, increases the risk of serious infections, such as bronchopneumonia and septicemia, which are the main causes of death. Kidney failure and steroid-induced pancreatitis also influence the adverse outcome. The existence of chronic kidney damage and high creatinine levels are related to a poor prognosis (MARTINS et al., 2000; SCOTT-MONCRIEFF, 2015).

Castration of carrier animals is recommended as a preventive measure, due to the hereditary risk of the disease (RHODES, 2003).

FINAL CONSIDERATIONS

Systemic Lupus Erythematosus (SLE) is a complex autoimmune disease in dogs and cats, marked by several clinical manifestations that mainly impact the joint, renal and cutaneous systems. Identification is complex and requires laboratory tests, such as ANA testing and biopsies. The goal of treatment is to manage symptoms and adjust the immune system response by employing corticosteroids and immunosuppressants. However, these procedures can increase the danger of infections. Generally, the prognosis of SLE is uncertain, particularly in situations of renal or hematologic compromise, which makes continuous monitoring of patients crucial. Neutering is advised to prevent the genetic spread of the disease. This research highlights the relevance of integrated strategies in veterinary medicine to improve the diagnosis and treatment of SLE, with the objective of providing a higher quality of life to affected animals.

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