

Equine Sarcoidosis

Introduction

Equine sarcoidosis (ES) represents an unusual idiopathic disease in horses, characterised by granulomatous inflammatory processes of the skin and/or other organs. Similar histological changes have also been described in dogs, humans, and cattle. The exact pathogenesis remains unclear; however, an aberrant immune response to an unidentified infectious agent or an allergen is suspected. Clinically, three forms of ES are distinguished: generalised sarcoidosis, partially generalised sarcoidosis, and localised sarcoidosis.

Clinical Presentation

Generalised equine sarcoidosis (GES) is also referred to as "idiopathic, generalised or systemic granulomatous disease" or "wasting syndrome." Clinically, affected horses may show loss of appetite, weight loss progressing to cachexia, and fever, with granulomatous inflammatory processes occurring in multiple organs as tumour-like masses. The lungs are most frequently involved; however, other organ systems such as the gastrointestinal tract, liver, spleen, or lymph nodes may also be affected. Further clinical signs primarily depend on the organs affected. Most horses with generalised sarcoidosis exhibit skin involvement in addition to visceral changes (Fig. 1).

In contrast to veterinary medicine, in human medicine 90 % of patients with sarcoidosis have pulmonary involvement, and 30 % show cutaneous manifestations, particularly around the nose and mouth.

No sex or breed predisposition has been identified in horses to date. Horses of any age can be affected, although the disease is rarely seen in animals younger than three years. The prognosis for GES is poor to guarded, as the condition usually does not respond to therapy and progressive deterioration of general health often necessitates euthanasia.

Localised equine sarcoidosis (LES) represents the most frequently occurring form of the disease (own observation). Clinically, LES is characterised primarily by a scaly or crusted exfoliative dermatitis.



Fig. 1: Horse with generalised ES: poor general condition, disseminated scaly and crusted skin lesions

Image source: Prof. Dr Derek Knottenbelt

Less commonly, solitary or multiple tumour-like skin nodules may be observed. The distal limbs are most often affected, although other body regions can also be involved. Variable hair loss and oedema may also occur (Sloet van Oldruitenborg-Oosterbaan, 2013). Skin lesions can be painful or, occasionally, pruritic. Involvement of the coronary band may be accompanied by laminitis and lameness.

In cases of LES, lifelong immunomodulatory therapy is often required to induce remission of skin lesions and to maintain it thereafter.

In **partially generalised equine sarcoidosis**, multiple or more extensive skin areas are affected, and patients frequently present with lymphadenopathy. Progressive involvement of additional organ systems with development into GES is possible. The prognosis for most horses is similarly poor to that of GES.

Pathogenesis

The pathogenesis of ES remains unclear. It is, however, thought to involve an aberrant or excessive immune response to an infectious agent or an allergen. To date, attempts to identify a definitive causative pathogen in tissue samples using molecular diagnostics (e.g., PCR) or special staining

techniques have been unsuccessful. Interestingly, poisoning with *Vicia villosa* (hairy vetch) can lead to clinical and histological changes similar to those observed in GES.

Generalised or systemic granulomatous diseases have also been described in dogs and humans, and their pathogenesis is similarly unresolved. In human medicine, it is hypothesised that antigenic stimulation of CD4+ T-lymphocytes leads to cytokine release, macrophage accumulation, and granuloma formation. Potential antigenic triggers discussed include mycobacteria, *Corynebacterium acnes*, serum amyloid A, non-infectious environmental antigens, and autoantigens (e.g., vimentin).

In humans, pulmonary sarcoidosis has been associated with inhalation of silica and metal particles in certain occupational groups (e.g., firefighters, rescue workers). Sarcoid-like granulomas have also been linked to tattoos, antiperspirants containing aluminium–zirconium complexes, and cosmetic procedures such as vitamin C microneedling. Furthermore, granulomatous skin lesions in children with primary immunodeficiencies have been associated with persistent rubella antigen following vaccination. It is therefore conceivable that, in horses, inert antigens that are difficult for macrophages to phagocytose, or immunological abnormalities, may similarly contribute to the pathogenesis of sarcoidosis.

Diagnosis and Differential Diagnosis

As other inflammatory skin conditions, such as pemphigus foliaceus, coronary band dystrophy, dermatophilosis, or multisystemic eosinophilic epitheliotropic disease (MEED), can clinically resemble sarcoidosis, a histopathological examination of multiple skin biopsies is recommended for the diagnosis of LES. These typically reveal, in addition to epidermal hyperplasia and hyperkeratosis, a pronounced diffuse granulomatous dermatitis extending from the superficial to the deep dermis (Fig. 2). Macrophages and multinucleated giant cells dominate the inflammatory response, with lymphocytes, plasma cells, and neutrophilic granulocytes also present. Special stains for fungi and bacteria, including acid-fast organisms, are negative.

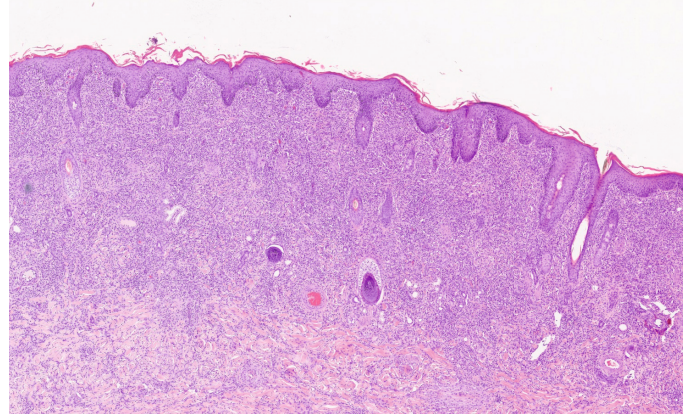


Fig. 2: Histological section of a diffuse granulomatous inflammation, H&E stain, 20× magnification

Image source: Laboklin

Treatment and Prognosis

Patients with generalised and partially generalised sarcoidosis generally show little or no adequate response to immunomodulatory therapy. In most horses with generalised or partially generalised sarcoidosis, euthanasia is often performed due to poor general condition and progressive weight loss leading to cachexia.

Horses with localised sarcoidosis show a variable response to immunomodulatory therapy. In many cases, remission of skin lesions can be achieved with glucocorticoid treatment. However, long-term maintenance therapy is often required to prevent recurrence or progression of skin changes (Wimmer-Scherer, 2024).

Long-term glucocorticoid therapy can be associated with an increased risk of laminitis, particularly in patients with concurrent conditions such as dysfunction of the pituitary pars intermedia (PPID) or equine metabolic syndrome. For patients showing insufficient response to glucocorticoid therapy, treatment with the folate antagonist methotrexate may be beneficial. A small proportion of horses with localised sarcoidosis may experience spontaneous remission.

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Further Reading: <https://uploads.laboklin.com//lp1225>

