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CHAPTER 19

Retrospective study of dermatophylosis in sheep in the Sertão of Paraíba

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ABSTRACT

The epidemiological, clinical and pathological aspects of dermatophylosis in sheep in the Sertão da Paraíba, Northeast Brazil, are described. From 2003 to 2023, 7 cases of dermatophylosis in sheep were diagnosed at the Animal Pathology Laboratory of the Federal University of Campina Grande. Of the affected animals, four were females and three males. Most of the animals were adults, four of whom were crossbred and three of the Santa Inês breed. The disease was most frequently diagnosed in April, followed by June and November. All the animals came from municipalities belonging to the Sertão region of Paraíba. Clinically, the animals presented multifocal to coalescent areas of alopecia, located in decreasing order of frequency, on the head, back, neck, ears and limbs. In two animals, the lesions were generalized. Macroscopically, the prevalent skin lesions were characterized by thickening of the skin by slightly moist crusts that formed grayish-white plaques. Histologically, multifocal to coalescent areas of epidermal hyperplasia (acanthosis) were observed, associated with marked parakeratotic and/or orthokeratotic hyperkeratosis. In the middle of the epidermis and between the keratin lamellae, multifocal areas of moderate neutrophilic infiltrate associated with cellular debris (intraepidermal pustules and serocellular crusts, respectively) and numerous filamentous, segmented and basophilic structures, compatible with *D. congolensis*, were observed. The diagnosis was established through epidemiological, clinical and anatomopathological findings. The disease occurs sporadically in sheep in the Sertão da Paraíba, affecting adult animals of both sexes, and characterized by alopecic and crusty skin lesions.

Keywords: Sheep disease, Skin diseases, Crusty lesions, Bacterial infection.

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INTRODUCTION

Dermatophylosis is a skin disease caused by *Dermaphilus congolensis*, a bacterium of the class of actinomycetes, Gram positive and filamentous that, although normally present in the skin of animals, acts as an opportunist under favorable conditions that unbalance the immune barrier of skin protection and leads to the proliferation of bacterial zoospores in the integument (Pereira; Meireles 2007; Macêdo *et al*., 2008). The bacterial invasion is followed by a neutrophil-mediated inflammatory response forming microabscesses in the epidermis that prevent the progression of the bacterium, but allowing its regeneration. This process of bacterial invasion, inflammation and regeneration is responsible for the appearance of pustular crusts characteristic of the disease (Pereira; Meireles 2007; Riet-Correa *et al*., 2007). The disease can have an acute, subacute or chronic evolution, being described more frequently in cattle, sheep and horses (Cunha *et al*., 2010). Clinical signs involve alopecia, crusty, well-defined and circumscribed skin rashes. In sheep, the main clinical characteristic is the agglutination of wool forming firm structures, a condition commonly known as sheep's wood wool (Castelo Branco *et al*., 2012; Vieira *et al*., 2017). Microscopically, parakeratosis, hyperkeratosis, acanthosis, dermal sclerosis, and neutrophil infiltration of the epidermis are observed (Riet-Correa *et al*., 2007). The diagnosis can be made through microscopic observation of the bacterium in crusts fixed and stained by methylene blue and can be confirmed through culture of the agent and molecular biology techniques (Hass; Torres 2016). The treatment of sick animals is carried out from therapy with penicillin, streptomycin or oxytetracycline. The control and prophylaxis of the disease are based on the isolation and treatment of the sick, avoiding management errors that can cause skin lesions and can serve as gateways for the agent, as well as providing shelter to the animals in rainy seasons (Hass; Torres 2016). The objective of this study is to describe the main epidemiological, clinical and pathological aspects of cases of dermatophylosis in sheep in the Sertão da Paraíba, Northeast Brazil.

MATERIAL AND METHODS

The biopsy and necropsy records of sheep at the Animal Pathology Laboratory of the Federal University of Campina Grande, from January 2003 to December 2023, were reviewed in search of cases diagnosed as dermatophyllosis. From the clinical and necropsy protocols, information was obtained regarding epidemiological data (gender, race, age and origin), clinical signs and anatomopathological findings. Photographic records were also retrieved to complement the description of macroscopic lesions. For microscopic description, the histological slides of the cases were reviewed and new slides were made from tissue fragments filed in paraffin blocks. All sections were routinely processed and submitted to hematoxylin and eosin (HE) staining.

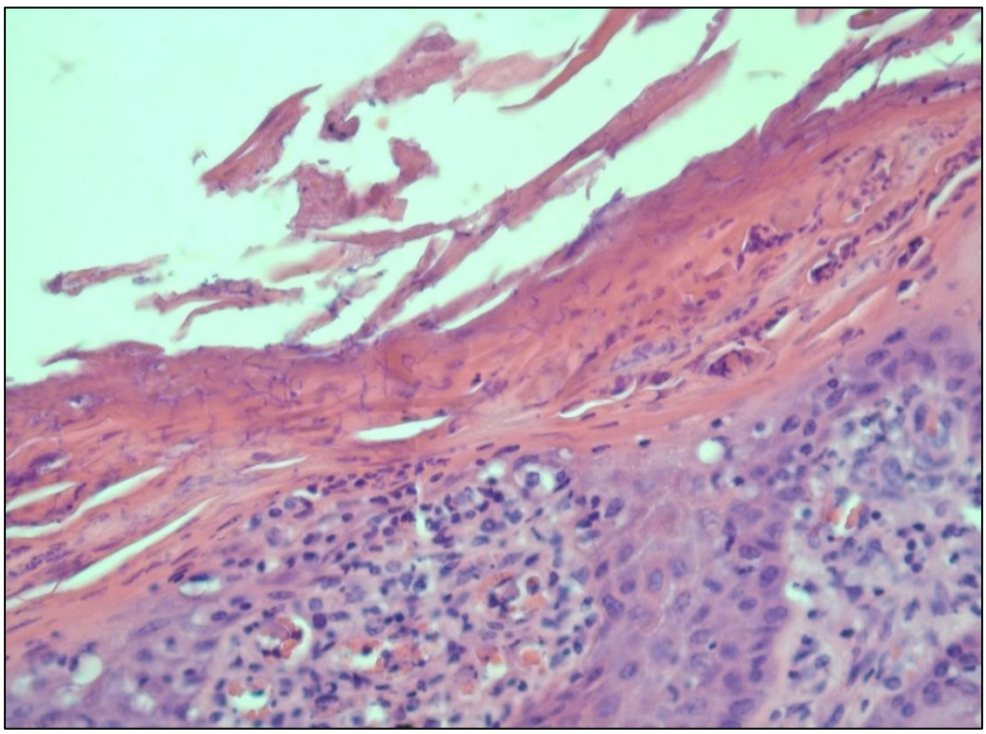
RESULTS

During the study period, 7 cases of dermatophylosis in sheep were diagnosed. Of the affected animals, four were females and three males. Most of the animals were adults (6/7), four of which were crossbred animals and three animals of the Santa Inês breed. The disease was most frequently diagnosed in April (5/7), followed by June (1/7) and November (1/7). All the animals came from municipalities belonging to the Sertão region of Paraíba. Clinically, the animals presented multifocal to coalescent areas of alopecia, located in decreasing order of frequency, on the head (5), back (4), neck (3), ears (2) and limbs (2). In two animals, the lesions were generalized. Macroscopically, the skin lesions were characterized by thickening of the skin by crusty, slightly moist, grayish-white plaques, which were easily detached when manipulated (Fig. 1). The adjacent hairs were rough and agglutinated, easily detached from manipulation; sometimes they contained piosanguinous secretion. Histopathology showed multifocal to coalescent areas of epidermal hyperplasia (acanthosis), associated with marked parakeratotic and/or orthokeratotic hyperkeratosis. In the middle of the epidermis and between the keratin gills, multifocal areas of moderate neutrophilic infiltrate associated with cellular debris (intraepidermal pustules and serocellular crusts, respectively) and numerous filamentous, segmented and basophilic structures, compatible with *D. congolensis*, were observed (Fig. 2). In three cases, direct examination of the crusts was performed, where basophilic, filamentous, transversely and longitudinally septate structures with morphology compatible with *D. congolensis were observed*.

Figure 1: Dermatophylosis in sheep. Crusted and alopecic lesions forming grayish-white plaques.

Source: LPA-FOCG.

Figure 2: Dermatophylosis in sheep. Hyperplasia of the epidermis with numerous basophilic filamentous bacteria. HE, Obj.40x.



Source: LPA-FOCG.

DISCUSSION

The diagnosis of dermatophylosis was established through epidemiological, clinical and anatomopathological findings. The epidemiological characteristics of the reported cases are in agreement with other studies, where dermatophylosis is described with greater incidence after periods of intense rain, affecting animals of both sexes indiscriminately (Riet-Correa 2007; Castelo Branco *et al*., 2012). It is believed that several stressors, including rainy and hot periods, as observed during the month of April in the region where the cases were studied, promote an imbalance of superficial and nonspecific immune defense barriers, breaking the integrity of the skin and allowing the zoospores of *D. congolensis* to invade the integument and produce bacterial dermatitis (Pereira; Meireles 2007). Clinically, the animals presented crusted and scaly skin rashes, consistent with other studies where the formation of multilaminate pustular crusts clinically characterized the disease (Pereira; Meireles 2007), Hass and Torres (2016) describe that in a typical dermatophylosis lesion, the local lesion appears as an area of matted hairs that can, when detached together with a moist crust, leave an exudative area red. Regarding the location of the lesions described, there was similarity to that described by Castelo Branco *et al*. (2012) and Macêdo *et al*. (2008), where the main sites of disease involvement were the back, head, ears and limbs of the animals. In only two animals, the lesions were distributed in a generalized way and presented a progressive and chronic form. Generalized lesions of dermatophylosis in sheep have been attributed to immunosuppressive factors such as food deficiency, excessive humidity, concomitant diseases and injuries caused by shearing in

these animals (Riet-Correa 2007). The diagnosis of dermatophylosis can be quickly established from the observation of the etiologic agent in the crusts of the lesions. The confirmation of dermatophylosis cases was due to the histological observation of numerous filamentous, segmental and basophilic structures that assume the appearance of a "pile of coins" or in the form of a "tram track", similar to what has been described in the literature, where the agent is described microscopically as being septate with longitudinal and transverse branched filaments, forming divided ribbons of spherical or oval cocus, with 0.5µm diameter (Hass; Torres 2016).

CONCLUSION

Dermatophylosis is a dermatopathy that occurs sporadically in sheep in the Sertão of Paraíba, affecting adult animals of both sexes and characterized by alopecic and crusty skin lesions. Histopathological findings, with intralesional filamentous bacteria, allow the definitive diagnosis of the disease.

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