

Comparative treatment approach for *Sarcoptes* and *Psoroptes* mite infestation in a Boer cross

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ABSTRACT

This case was carried out to compare the healing process and time for the treatment of mange in goats using a combination of Ivermectin with dexamethasone to the earlier Ivermectin with antihistaminics approach. A 3 ½ years old female Boer cross goat was presented with a complaint of crusty lesions on different parts of the body during a routine farm visit in Selangor, Malaysia. Microscopic examinations of the skin scrapes taken revealed *Sarcoptes* and *Psoroptes* sp. of mites, while hematological analysis showed slight leucocytosis, neutrophilia with left shift, monocytosis, hyperproteinemia and hyperglobulinemia. Ivermectin injection at 0.2 mg/kg subcutaneously was administered once every 2 weeks in 4 divided doses, while Dexamethasone injection at 1 mg/10 kg and multivitamin at 10 mg/kg IM for 5 days repeated at alternate weeks. Significant improvement was recorded 6 weeks after commencement of treatment and full recovery at 10 weeks. The current drug regimen proved more effective when compared with previous cases that were treated with a combination of ivermectin and antihistaminics.

Keywords

Boer cross, Mange, *Sarcoptes* sp., *Psoroptes* sp., Ivermectin, Dexamethasone

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INTRODUCTION

Mange also known as scabies is a common problem encountered in many domestic animals which includes livestock, poultry and companion animals (Lusat, 2009, Terry, 2011). Goats can be infested by several species of mites but the common species on them are classified into burrowing mites (*Sarcoptes* spp and *Demodex* spp) and the non-burrowing mites (*Psoroptes* and *Chorioptes*). Lack of good hygiene combined with environmental factors, poor nutrition, overcrowding, stress and immune-suppression are some of the predisposing factors (Lughano and Dominic, 2006). Transmission of the mite from one goat to the other is through direct body contact, which is rapid and highly contagious. Microscopically, these mites can be differentiated based on the appearance of their pedicles. The pedicles of the *Psoroptes* type of mite are long and jointed, *Sarcoptes* mites also have long pedicles but they are not jointed while the pedicles of *Chorioptes* mites are short. While *Demodex* spp. (follicular mites) are identified based on predilection site.

These mites pierce the skin and suck lymph thereby stimulating an immune reaction by the host and alterations in hematological parameters (Christensen, 2005). The affected area swells and serous fluid seeps out to the surface, creating a crust and scabs. The condition is highly contagious causing irritation to the host, hair loss on the affected area and leads to self-induced trauma like severe pruritus, rubbing its body against the wood or wall and even use their own horns to rub on the pruritic area leading to abrasion or laceration on the skin (Christensen, 2005; Pérez, 2011; OIE, 2013). Apart from that, huge losses are recorded due to reduction in performance and weight loss in both male and female. Mites also cause financial burdens as a result of diagnostic, therapeutic and preventive programs in the course of prevention and treatment of the condition. Their bites damage the skin areas, leading to reduction in the marketability of goat skin (Zewdie, 2010). Poor semen production in male goats from active breeding to the point of inability to inseminate the does is one of the most important effects associated with mange mites due to alterations in temperature and irritation along the scrotal area. This study review new trends in diagnosis and treatment of mange caused by *Sarcoptes* and *Psoroptes* mites in goats, using a combination of Ivermectin with dexamethasone as compared with the previous cases that were treated with a combination of ivermectin and antihistaminics.

Patient history and signalments: A three and half years old female Boer cross goat weighing 50kg was presented during a routine visit rounds with some crusty lesions on its neck, peri-ocular, ear and nasal regions for the past 10 days. It was managed intensively and fed with grass, pellet and palm oil husk and no history of medication prior to presentation.

Clinical signs: Physical examination revealed the animal was alert and all the vital parameters within the normal range with a body condition score of 2.5/5. Mucous membranes of the mouth and eyelid were pink with capillary refill time (CRT) of less than 2 seconds. All other systems were normal except the integumentary system which showed some pruritic, crusty and alopecic skin lesions with dried scabs at the ventral neck region, peri-ocular, bilateral external ear pinnae, muzzle region, withers and rump regions (Figure 1-4).

Differentials: Major differentials were mange mite infestation caused by *Sarcoptes* and *Psoroptes* species, dermatophytosis and dermatophilosis due to *Dermatophilus congolensis*.



Figure 1: Skin lesions on wither.



Figure 2: Crusty lesion on ear.

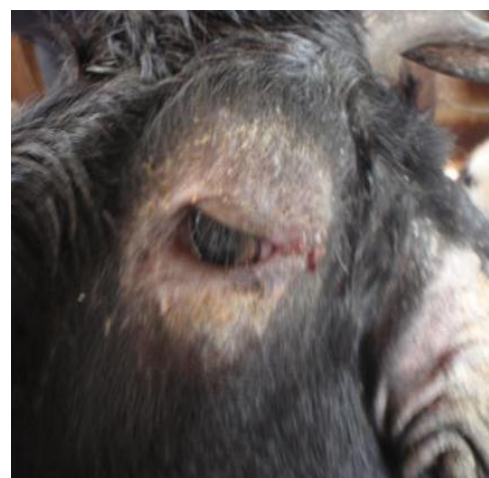


Figure 3: Peri-ocular skin lesion.



Figure 4: Skin lesion on muzzle

LABORATORY DIAGNOSIS

Blood sample was collected from the jugular vein in sterile EDTA tubes and sent to the laboratory for hematological and biochemical tests. Deep skin scrapings at the periphery of the lesions and observed under the microscope at x40 magnification for identification of mites according to the [SPCG \(2009\)](#).

TREATMENT AND MANAGEMENT

Hematological analysis revealed slight leukocytosis, neutrophilia with left shift, monocytosis, hyperproteinaemia and hyperglobulinaemia. Examination of the skin scrapings by microscopy reveals *Sarcoptes* sp. and *Psoroptes* sp. mites (**Figure 5 and 6**).



Figure 5: Burrowing mite (*Sarcoptes* sp.), 40X



Figure 6: Non-burrowing mite (*Psoroptes* sp.) 40X

Ivermectin injection was administered at a dose rate of 0.2mg/kg subcutaneously once every 2 weeks in 4 divided doses as a systemic and topical anti-parasiticide, while dexamethasone injection at 1mg/10kg and multivitamin injection at 10mg/kg IM were administered intramuscularly which were then repeated at alternate days.

There was a significant improvement 6 weeks after commencement of therapeutic medication and full recovery at 10 weeks (**Figure 7 and 8**).



Figure 7: Progression of the skin lesions at the withers on the day of presentation (TOP) and the lesion on the third week of treatment (Bottom).

DISCUSSION

In order to successfully treat an infectious disease, a good understanding of the biology of the organism is very important, because a lot of different organisms can cause similar clinical signs on an animal. As seen in this case, the tentative diagnosis was made based on

the clinical presentation of the disease and the areas affected, which is in line with (Christensen, 2005; Kaufman et al., 2006; Nelson, 2009; Mercks, 2011). It was further confirmed in the laboratory by deep skin scrapping collected around the periphery of the lesions. Absence of fungal hyphae on hair shaft rules out dermatophytosis as earlier described (Nweze, 2011) and absence of lesions of pustular dermatitis with thin scabs rules out dermatophilosis in our diagnosis.



Figure 8: Progression of the skin lesions at the periorbital region on the day of presentation (TOP) and the lesions on third week of treatment (Bottom).

Alterations in haematological values as seen in this study may be as a result of the lymph sucking activities of the mites as earlier described by Christensen (2005). The slight leucocytosis may be as a result of compensatory mechanism of the body system to replace the lost lymph fluid caused by mites sucking activities. The neutrophilia may be a result of increased phagocytic mechanism against the salivary toxins of the mites which may carry some microorganisms, while the left shift is due to presence of immature neutrophils in the blood circulation. Monocytosis as seen in this study may be due to inflammatory reactions due to skin tissue injury by the mites. Hyperproteinemia may be due to increase production of immunoglobulins as evidenced by hyperglobulinemia.

Administration of Ivermectin at a dose of 0.2 mg/kg at weekly interval was in line with (Lughano and Dominic, 2006; Lespine, 2005; Mercks, 2011). However, to digest the layers of crusts and scabs which hide the

mites and expose them to the effect of the drugs, the treatment regimen using Ivermectin and dexamethasone (Figure 7) proved to be more effective than previous combination using Ivermectin and antihistamine (Figure 8).

However, other researchers use hydrogen peroxide bath to digest the layers of crusts and scabs which hide the mites and expose them to the effect of Ivermectin (Nelson, 2009). Multivitamin was given in this case to enhance the uptake and improve the bioavailability of the drugs in the system, as some vitamins are known to revitalise death tissue.

CONCLUSION

A combination of Ivermectin and dexamethasone was more effective in treating the condition than the earlier practice of using a combination of Ivermectin and antihistamines. Therefore, clinicians are advised to use combination therapy when handling cases of mange infestation in small ruminants.

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