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Lameness in cattle herd due to lime toxicity: A case report

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ABSTRACT

Forty adult Friesian cows were presented to the University Veterinary Hospital, Universiti Putra Malaysia with primary complain of lameness. Upon physical examination of the cows, open wounds were found at the distal limbs, dorsal hoof, knee joint, metacarpal region, and udder. Based on history, clinical observation and physical examination, the cause of the lameness was diagnosed as of non-infectious origin; the cattle were affected with chemical burn originated from exposure to lime. The affected cattle were treated similarly to that of the line of open wound treatment; the wound was cleaned with topical application of the mixture of dermapred-iodine-benacillin. Flunixin meglumine dosed at 2.2 mg/kg bwt and Oxytetracycline dosed at 20 mg/kg bwt were given intramuscularly as anti-inflammatory and prophylactic antibiotic, respectively. This case report describes diagnosis of the cause of lameness, and its management in cattle herd caused by lime toxicity for the first time in Malaysia.

Keywords

Lameness, Lime toxicity, Management, Open wounds

ARTICLE HISTORY

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INTRODUCTION

Disinfectants can destroy infectious agents such as bacteria and viruses. Disinfectants are usually used on inanimate objects as they are too strong to be used on living tissues (Blood, 2011). There are three major categories of disinfectants which include chemical, physical, and biological agents (Blancou, 1995). The chemical disinfectants include sulphur, mercury, alkalis, and acidic products. Rising of temperature, fumigation, drying and filtration are the major ways of physical disinfection. Burial method is used as a biological disinfection tool (Blancou, 1995).

Lime (also known as calcium oxide) is used as an alkali disinfectant in and around livestock industry (Gaskin, 2010). Lime is considered as one of the cheapest and reasonable disinfectants to be used around farms but it tends to dry the skin and hooves of animals (Gaskin, 2010).

Lameness is a multifactorial disorder that many changes gait of animal (Blood, 2011). In cattle, lameness can be either due to noninfectious or infectious origin. The noninfectious factors causing lameness in cattle depends on environment, nutrition, breeding, or cow behavior; and the infectious causes may be of foot rot, interdigital dermatitis, and dermatitis due to viral or bacterial infections (Blowey, 2005). This clinical case reports an occurence of lameness in cattle herd originated from noninfectious cause due to excessive

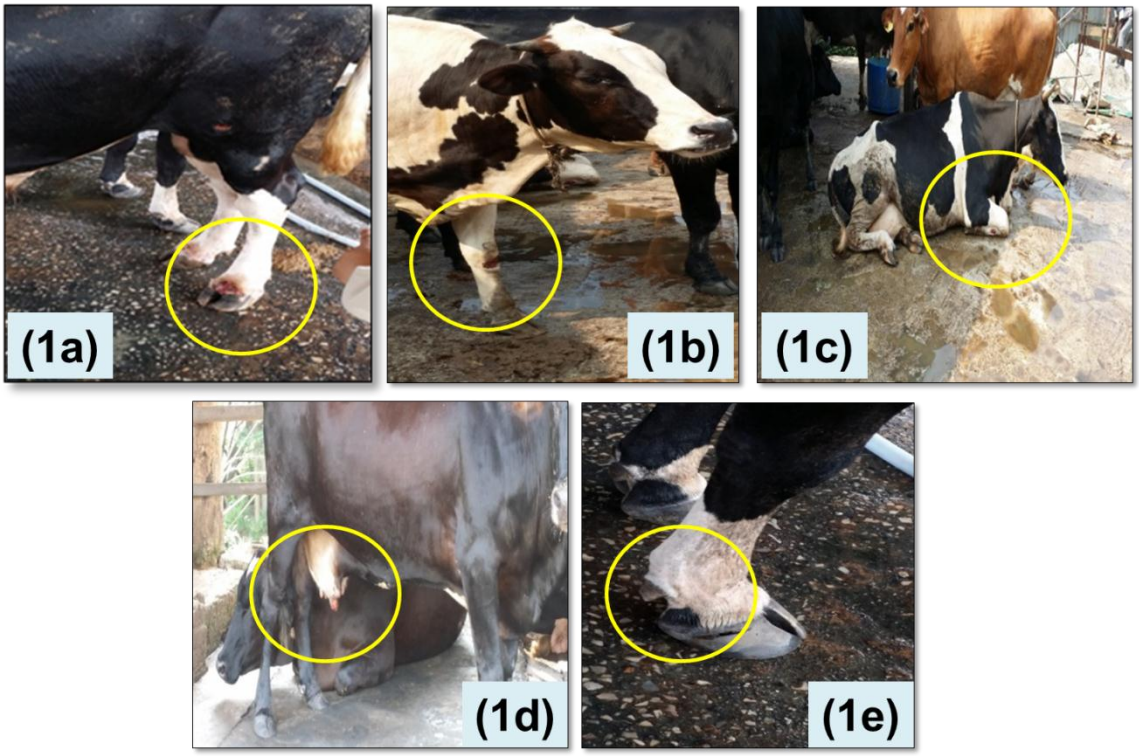

Figure 1: Physical examinations in a herd of cattle. (1a) wound on dorsal of the hoof, (1b) wound on the knee joint, (1c) wound on the metacarpal region, (1d) wound on the udder region, (1e) necrotizing hoof.

use of lime in the farm. Also, this report describes the the successful management procedure of the lameness condition.

CASE HISTORY

History: Forty adult Friesian cows with the history of weight bearing lameness were presented to the University Veterinary Hospital, Universiti Putra Malaysia. The farm was managed semi-intensively, and all the cows were vaccinated and dewormed.

Clinical Observations: The cows of the herd showed signs of lameness with different degrees. The cows had wounds at their hooves, limbs, and udder region.

Spot Examination: Through direct spot observation of the farm environment, whitish powder stains were seen on the floor of the pens, soil and the grazing areas.

Physical Examination: Upon physical examination, circular open wounds were found at the distal limb, dorsal hoof (**Figure 1a**), knee joint (**Figure 1b**), metacarpal region (**Figure 1c**), and udder (**Figure 1d**) of the cows. Detailed hoof examination revealed that the hooves were soft and showed lesions of necrosis without any foul smelling (**Figure 1e**).

Diagnosis: Blood examination showed that the affected cows were having leucocytosis and lymphocytosis. However, there were no significant changes in blood biochemistry, which confirmed the origin of the condition as of non-infectious cause. Bacteriological examination of the swab samples taken from hooves of the affected cows failed to isolate foot rot causing organism. Based on the history, clinical observation, physical examination, and laboratory findings, the case was finally diagnosed as lameness caused by chemical burn for lime toxicity.

Clinical Management: The clinical management of the case was aimed to reduce the effect of chemical burn caused by lime toxicity. The farm management was advised to stop using lime immediately and wash the pen thoroughly with water. Besides, the affected cows were treated with Flunixin meglumine dosed at 2.2 mg/kg bwt intramuscularly for 3 days as anti-inflammatory and analgesic. The cows were injected with prophylactic antibiotic using Oxytetracycline dosed at 20 mg/kg bwt via intramuscular route to prevent secondary bacterial infection. The wound in the affected cows were washed and cleaned by using mixture of dermapred, iodine and Benacillin, dosed at

1 mL/16-kg bwt topically on the wounds. The caretaker of the animals was advised to clean the wound daily and apply the medication twice daily. The affected cows showed positive response within 2 weeks of post-treatment, and became cured completely.

DISCUSSION

Lime is strongly alkaline and corrosive in nature, and has been used for centuries in agriculture and livestock industries for disinfection purposes (Kahrs, 1995; Himsworth, 2008). Alkaline properties of lime allow it to destroy most bacteria and viruses through saponification of the lipid membrane resulting structural disruption of the microorganism (Himsworth, 2008). A major disadvantage of using lime is that it may cause irritation, discomfort or blistering, causing severe burns on surface contact and mucous membrane (Kahn, 2005). It will also cause burn the footpads of animals if left on the ground or floor, and can also cause the hooves of the animals to become dry and frazile. Dry and cracked hooves will eventually lead to foot rot and lameness (Shearer et al., 2000; Gaskin, 2010). The findings of the case report were in agreement with that of Gaskin (2010).

The resting posture of cattle is usually on sternal recumbence where all 4 limbs and the lower abdomen remain in contact with the floor, resulting to the formation of wounds due to the chemical burn (Houpt, 2011). The clinical findings of the affected cows in the present case were in agreement with Houpt (2011). Treatment consisted of removing residual material and applying protective ointments together with supportive treatment (Kahn, 2005).

CONCLUSION

Disinfectant is important in controlling disease outbreak in farms. Lime is one of the cheapest and commonly used disinfectants in Malaysia. However, it should be used cautiously to prevent unnecessary losses due to its strong alkaline properties.

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