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Grade-IV laminitis in Murrah buffalo: A case study

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Abstract

Foot and leg deformities are among major health concern issues occurring in dairy cattle and buffaloes worldwide. Various factors that predispose to development of this condition in animals are nutrition/feeding, flooring, housing, environment and managerial conditions. Lameness in animals is a serious disorder affecting health and production status hence substantial economic losses to the farmer. The cases of laminitis are more complicated if wrongly treated or presented late causing more soft tissue damage thereby increasing cytokines and inflammatory cells. A delayed case of laminitis is discussed which was effectively managed by the use of systemic antibiotics, anti-inflammatories, corticosteroids, proteolytic enzymes along with local dressing of wound following pus removal. Supportive therapy with minerals/vitamins together with change in prevailing environmental conditions and a strict dietary restriction with exclusion of concentrate and increase in fibre portion helped in speedy recovery. However the cases of lameness tend to re-occur but recovery of about 75-80% in the animal condition was observed as evident by limb posture and locomotor ability.

Keywords: Buffalo, laminitis, treatment, economic losses

Introduction

Laminitis is a medical term used for the inflammation of laminae and adjoining soft tissue around the foot of animals. Disease is progressive and often degenerative in nature, in later period leading to complete loss of locomotary functions. It is a very painful inflammatory condition most common in lactating cows/buffaloes in progressive parity, simultaneously raised on uneven floors. Various Clinical signs associated with this condition include tenderness at foot region progressing to inability to walk, increased temperature at the hooves, increased digital pulses. In later stages animal is reluctant to walk, lies down, offed. The combined effect of all these symptoms lead to increased cost of treatment and management hence compelling the farmer to cull the animal.

Laminitis in ruminants can be due to many causes that include various infectious, nutritional, toxic and managerial factors. Acute cases result from over consumption of grain also called grain overload, however subclinical and chronic cases results in the development of secondary claw and horn lesions. These include abnormal growth with distortion of the hoof wall, leading to formation of cracks and fissures which ultimately progress to poor quality horn condition.

Various events that are associated with development of laminitis are sepsis, toxemia, trauma/injury, grain/carbohydrate overload, retained placenta, obesity, prolonged glucocorticoid therapy (Huntington *et al.*, 2009) ^[1] and bruises. In either case, there is an increased blood flow to the hoof region primarily, bringing in inflammatory cells and mediator cytokines. If infection is not treated in early phase or if is wrongly diagnosed there is fluid or pus accumulation at the site hence flaring up the infection. Infected limb can be grossly differentiated by persistent swelling and increased heat at the area. Initially area is painful to touch however as the times subsides, area becomes non inflammatory with animal showing compensatory signs of raised limb above the floor/ dragging of the affected limb. In the later stages there is decreased oxygen and nutrient delivery to the affected limb, thus altering the metabolism inside (Orsini *et al.*, 2014) ^[2].

However laminitis can be effectively controlled and managed in early stages by the use of systemic antibiotics, anti-inflammatory, analgesics, vasodilators and cryotherapy (Baxter, 2011) ^[3].

Case History and Observations

A Murrah graded she-buffalo, aged 7-8 years was presented with the history of lameness since last 4 months. Owner suspects for trauma/injury due to nail or any other sharp object in the hoof region, while animal was on grazing pasture.

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However on examining the hoof region of the animal, no such object was recovered by the owner. Animal was in good condition and normal appetite with slight abnormal gait following 3-4 days post injury. Owner now complains that subsequently swelling developed in the right hind, planter region of the limb which was visible by day 15-18. Animal became progressively weak and marked decrease in live body weight. Milk production drastically reduced from 6litres/day to 2litres/day and now no milk production at all. Animal is dry with poor bodily condition. No calcium or mineral supplement feeding was practised by owner. Concentrate feeding @1-2kg/day was carried out.

Animal was locally treated by paravet for three days with Inj. Dicrystacine, Inj. Melonex and Inj. B-complex; following 15 days of suspected injury. Incision was given over the swollen mass and pus mixed with blood was drained from the site, however no sepsis was maintained as reported. Proper follow up was not given which caused re-occurrence of the condition. Owner complains that animal subsequently became lame and doesn't bear weight on the affected right hind limb at present.

Animal was reluctant to walk and held the affected limb up the floor. On forceful walking animal witnessed severe pain which was evident from the stance adopted. Affected leg confirmation and posture was disrupted. There was jerky forward and backward motion of the limb. On palpating the area animal restrained with moderate swelling present at the site. Body condition score of the animal was poor. Animal was raised on hard uneven floor with no proper sanitary conditions.

Treatment and Management

Cleaning of the area was done with potash water to expose the affected site. Small incision of 2-3cm was given over the swollen area. Removal of creamy pus followed by wound freshening was done. Local dressing of the area with betadine and scavon ointment followed by instillation of topicure spray to prevent maggot infestation was done. Parental administration of antibiotics (Injection oxytetracycline @ 5mg/kg), NSAID's (Inj. Ketoprofen @ 3mg/kg), corticosteroid (Inj. Isofuperadone single dose @ 10mg/kg) and supportive therapy with vitamins and minerals (Inj. T-Phos, Inj. Belamyl) was done. Parental administration was done for three days followed by oral administration (Bolus Steclin, Bolus Melonex) for five consecutive days. To promote better healing and fast recover serratiopeptidase (Bolus serrakind) was given for five days. It is a proteolytic enzyme that helps in reducing pain and swelling associated with inflammatory conditions. Owner was advised to do hot fomentation of the affected limb followed by the application of inflammin cream. Dressing was done on alternate day basis.

Various managemental measures were incorporated in the diet and living environmental of the animal which are as follows. Following treatment animal was kept in clean and dry area away from moist conditions. Concentrate intake of the animal was reduced with plenty of ad-libitum water available all the time to animal. Mineral mixture (Agrimin Forte) and calcium (Osteovet) supplementation was advised for the animal to check Ca:P imbalance and overcome deficiency and energy deficit hence hastening repair of the tissue. Foot bath once a week with potash/Copper/Formaldehyde was recommended for about 5 minutes to reduce infection.

Results and Discussion

Lameness is frequently counted as the top three most common disorders in dairy cattle (Whitaker *et al.*, 1983; Enting *et al.*,

1997) [4, 5]. Pain and discomfort caused lead to decreased production and productivity in the lactating cows/buffaloes, which makes it a welfare concern issue (Whay *et al.*, 1997) [6]. In cattle it is a major welfare concern with economic losses occurring due to reduced weight gains, infertility, replacement costs, treatment costs and death in severe cases.

Prevalence of lameness In India has been reported between 8 to 30.5% (Chawla *et al.*, 1991; Singh *et al.*, 1999; Randhawa, 2006; Sood and Nanda, 2013) [7, 8, 9, 10] however worldwide, lameness is among the top three most economically important diseases after mastitis and infertility (Enting *et al.*, 1997) [4].

Diagnosis of the condition is complex and requires pre-requisite full hand knowledge about the anatomy and physiology of the area affected which includes the underlying musculoskeletal, nervous and integumentary systems. A structured approach to investigate and treat lameness is vital for optimum recovery (Hary *et al.*, 2011) [11]. Incidence of lameness varies with age, sex and species of the animal and the type of rearing and managemental practise adopted.

Above presented case was effectively managed with improvement in foot conditions and locomotor ability of the buffalo following 10 days of treatment. Use of a broad spectrum antibiotic like oxytetracyclines was helpful along with local wound dressing to reduce infection flare up. However, isolated use of the antibiotic only without surgical cleaning of the area would not have recovered the wound as produced by combined therapy. Therefore, concomitant use of parental antibiotics and topical bactericide was of great importance. However, use of antibiotics should be restricted only to the cases where secondary infection with bacteria is encountered.

Ketoprofen, a derivative of propionic acid is a potent NSAID with good anti-inflammatory anti-pyretic activity and analgesic effect. It has been licensed for the use in lactating cattle and was used in the following study at a dose rate of 3 mg/kg ketoprofen. Increase in locomotor activity in dairy cows was reported due analgesic effects produced in animals following ketoprofen use (Whay *et al.*, 2005) [5]. At a dose rate of 3-63 mg/kg ketoprofen was found very effective in reducing hoof pain and lameness in horses when compared with phenylbutazone (Owens 1995) [12]. Similar findings were observed in the present study hence showing drug potential in reducing pain and its role in inflammatory conditions.

Supportive therapy with corticosteroids and vitamin/mineral supplementation ensured fast healing. Animal started to bear weight on the affected limb after 25 days post therapy when combined with dietary and managemental practices. Dietary restriction of gram feeding was helpful as it reduced the chances of rumen acidosis, thereby reducing populations of the gram negative bacteria which produce endotoxins that through circulation predispose to lameness in animals. Grains also must be processed properly to reduce ruminal upsets hence maximizing starch digestion.

Conclusion

Lameness is worldwide reported, an economically important disease occurring in almost all animals. In cattle/buffalo it is a major health concern issue as it greatly reduces productivity forcing the owner to cull his animals. Such cases require long adequately planned treatment protocol. However cases can be effectively treated by the use of parental antibiotics, anti-inflammatory, steroids combined with supportive therapy. Cases of laminitis are recurring and commonly re-occur when treatment is stopped hence it is advised to undertake proper treatment regimen along with providing suitable living

environment to the animals. In order to preserve full productive potential of the buffaloes such cases should be early reported as delayed cases further damage the hoof and digital tissue hence prolonging repair and recovery. High concentrate feeding with hard, uneven floors are major contributors to development of this condition in animals.

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