

Coccidiosis In Cattle and Buffaloes and Its Management

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Abstract

Coccidiosis is an economically significant protozoan disease of cattle and buffaloes that is distributed globally. It especially affects calves under one year of age and has a corresponding impact on further development and economic outcomes. Infected animals with well-developed immune responses may suffer from diarrhoea and then self-heal, but sometimes lead to high mortalities because of extreme gastrointestinal disorders. Hence, a better understanding of the coccidian life cycle, pathogenesis of the disease, diagnosis, prevention, control and treatment options are essential to optimize animal health. Management procedures that minimize stress and prevent contamination of feed and water, may improve the overall health of each individual animal preventing coccidiosis.

Introduction

Coccidiosis in bovines is a common disease caused by sporozoan protozoa of the genus *Eimeria*. It is primarily a disease of young animals, particularly calves of 3 weeks to 6 months of age, but occasionally yearlings and adults are also affected if the infection is very heavy. Adult animals are carriers and pass oocysts in the faeces, which act as a source of infection for susceptible young animals (Soulsby, 1982). Coccidiosis may occur throughout the year but is more prevalent during winter months, as well as in confined animals under intensive husbandry practices. In winter, mostly *E. zuernii* is involved in infection but, *E. bovis* is also common (Geurden *et al.*, 2005). This parasite usually infects epithelial cells of the gut mucosa during

development (Ernst and Benz, 1986) and severely damages the intestinal lining which causes loss of appetite, body weight and feed efficiency, unthriftiness, emaciation, diarrhoea, dysentery, anaemia and increased susceptibility to other diseases (Bohrmann, 1991). Morbidity, impaired performance, mortality, and cost of anticoccidial treatment may lead to great economic losses.

Etiology

Infection with single eimerian species is rare and mixed infections are more common. Among the twelve identified *Eimeria* species, commonly occurring species are *E. auburnensis*, *E. bovis*, *E. ellipsoidalis* and *E. zuernii*. Of these, *E. zuernii* and *E. bovis* are most pathogenic species that are commonly associated with clinical manifestations of the disease in calves and young cattle and buffaloes. Concurrent infections also play a vital role in the clinical course of bovine coccidiosis (Soulsby, 1982).

Transmission

- Coccidiosis is transmitted by ingestion of sporulated oocysts along with contaminated feed, water, soiled pastures, or by licking contaminated surfaces (Georgi, 1985). The severity of the disease depends mainly on the number of oocysts ingested by the animal besides other factors.
- Higher stocking densities, unhygienic practices, highly moist surroundings and the presence of oocysts in maternal faeces, young calves kept in close contact with adults and other stress conditions like weaning may increase the chance of transmission of

infection. After an abrupt climate change mortality may be high.

Pathogenesis

Clinical disease is usually the result of mixed infection with more than one species. As the life cycle of *Eimeria* continues, many meronts and gamonts are formed, more tissue damage occurs, with leakage of blood and plasma into the intestinal lumen and diarrhoea. When the disease progresses, epithelial cells are damaged, intestinal mucosa is sloughed and haemorrhage occurs. Due to this, the intestine is no longer able to efficiently absorb nutrients and electrolytes, leading to various imbalances. Segments of mucosa, fibrin and blood clots are often visible in the faeces. *E. bovis* and *E. zuernii* primarily infect the distal ileum, caecum and colon (Step *et al.*, 2002).

Clinical signs

E. zuernii is the most pathogenic species that initially causes intestinal catarrh with foul smelling watery faeces for 1-2 days. Repeated infections lead to chronic disease which is characterized by alternate discharge of bloody and pasty mucoid faeces, anorexia, fever, debility, pale and congested conjunctival mucous membrane, rapid respiration, convulsions, tremors, emaciation and animals may die from pneumonia. In severe infections, faeces are liquid, bloody and may contain strands of intestinal mucosa (Ernst and Benz, 1986) and animals may not survive. Winter coccidiosis in bovines is primarily attributed to *E. zuernii*. *E. bovis* infection causes intestinal bleeding, bloody diarrhoea and copious oocyst discharge. Recurrent infections may result in the aggravation of large intestinal lesions.

In mixed infections, the symptoms are characteristic of the disease. Generally, onset of diarrhoea starts after 16 to 23 days in *E. bovis* and *E. zuernii* infection and 3 to 4 days in *E. abumensis*. In acute cases, animals exhibit signs like abdominal pain, foul smelling bloody and mucoid diarrhoea, rough coat, drooping ears, listlessness, soiled hind quarters, anorexia, tenesmus, inability to rise and partial paralysis of the anal sphincter exposing the rectal mucosa. Hypoproteinemia and hypoalbuminemia may be noticed due to impaired absorption of proteins from intestine. Young calves, in acute infections, die within few days especially when the stools

carry large quantities of blood. Secondary microbial complications like fever, pneumonia may also be present. In chronic cases, the animal has rough coat, reduced body weight, passes watery faeces with mucus and is emaciated.

Postmortem lesions

Soiling of the perianal skin, hind legs with faeces and blood, with matted hair, pale and anaemic mucous membranes, small amounts of reddish exudates in the abdominal cavity, congested intestinal serosa, reddening and catarrhal changes in the mucous membrane of the small intestine, intestinal contents are fluidy with foetid odour. Swollen, congestion, pin point haemorrhages in the large intestine, with streaks of blood and mucus. Desquamated patches of mucous membrane which appear as white flakes in the fluid of intestinal contents. Mature and giant schizonts appear as white pin-point to pin-head size bodies in the intestinal mucosa.

Diagnosis

- Based on clinical symptoms of diarrhoea, dysentery, tenesmus, fibrinous casts and pale mucous membranes.
- Demonstration of oocysts in diarrhoeic faeces by microscopy (direct smear or concentration methods).
- Coccidiosis should be differentiated from bovine dysentery, Anthrax, BVD, Salmonellosis and Cryptosporidiosis.
- Necropsy findings.

Treatment

- Sulphonamides given @ 225 mg/kg bw/day orally followed by 110 mg/kg bw for 3 days.
- Amprolium is most effective drug given @ 10 mg/kg bw/day in feed or water or by drench for 5 successive days for treatment, and @ 5 mg/kg bw/day for 3 weeks orally (in feed or water) for prevention.
- Sulfamethazine is given @ 140 mg/kg bw in feed for 3 days for treatment, and @ 5mg/kg bw/ day in feed for 15 days for prevention of coccidiosis in calves.
- Monensin is given @ 1 mg/kg bw in feed for about 5 weeks as a preventive measure.
- Lasalocid is used @ 13 mg/kg bw for 2-3 weeks for prevention.
- Diiodohydroxyquinoline (Iodoquinol) is used @ 5 gm tablet/200 kg bw for 2-3 days as therapeutic measure.

- Nitrofurazone is used as a curative drug @ 15mg/kg bw/day orally for 7 days.
- Decoquinatate is given @ 0.5 mg/ kg bw orally for 4 weeks for treatment.
- The supportive therapy with fluids, multiple electrolytes and multivitamins preparations.
- Sulphadimidine @ 100 mg/Kg bw intravenously for 5 consecutive days.

Management

- Providing an adequate amount of colostrum, nutrition to newborn calves and good hygiene and sanitation in calf shed may prevent coccidiosis in calves.
- Reducing and monitoring stress levels caused by weaning, a change in feed and overcrowding.
- Sterilize bedding and surroundings with 1.25 % sodium hypochlorite or 0.5% cresol or phenol or fumigation with formaldehyde.
- Calves should be isolated within 24hrs after birth.
- Growing calves should not be kept with adult animals.
- Avoid contamination of feed and drinking water with infected faeces.
- Maintain general hygiene to prevent the oro-fecal infection route.
- Regular faecal examination of different groups of animals.
- Positive animals should be isolated from the herd and treated completely.
- Waterers, feeders and equipment should be cleaned regularly to reduce faecal contamination.
- Dietary changes should be as gradual as possible.
- Proper disposal of faeces.

Conclusion

Coccidiosis has been an important cause of diarrhoea in young calves under one year of age as they are immunocompromised. Severe economic losses were noticed in dairy herds where large numbers of calves are housed, especially with *E. zuernii* which causes “Winter coccidiosis”. A major difficulty in treating clinical coccidiosis is that signs of the disease do not appear until the life cycle is almost complete and by this time, the gut may be severely damaged. Hence, treatment with anticoccidial drugs should

be administered at the earliest clinical signs as it may reduce the severity of the disease and decrease mortality. Preventive health programs that reduce stress and environmental contamination may also help to minimize the impact of coccidiosis.

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