Concurrent Coccidiosis and Bovine Papular Stomatitis Infection in Calves

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Abstract


A group of 23 calves (2-3 months) showed diarrhoea after weaning and short distance transportation. Buccal cavity lesions of papular nature on the muzzle, gingivae, buccal papillae, inner surface of the lips and hard palate were observed. Buccal cavity lesions showed hyperplastic epithelium which consisted of focal areas of ballooning degeneration. Eosinophilic intracytoplasmic inclusion bodies, characteristic of bovine papular stomatitis were seen in the affected cells. At necropsy, sexual and asexual forms of coccidia were determined on the epithelium of the caecal and colonic crypts. Large number of oocysts were detected on the faecal examination. All the affected calves were treated by intramuscular injection of sulphadimidine. Newly weaned calves were fed lasosolids as prophylaxis. One month after the onset of outbreak, the syndromic subsided.

Key words: Calf, coccidiosis, bovine papular stomatitis, diarrhoea, oral lesions.

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Introduction

This report describes an outbreak of concurrent infections of coccidiosis and bovine papular stomatitis in a group of calves. It highlights the importance of thorough clinical examination and appropriate laboratory tests for differential and confirmed diagnosis in cases with oral lesions and diarrhoea.

Case Report

In a self-contained dairy herd of 500 cows, where 45 weaned calves had been transported to other parts of the farm at 5 km distance, a group of 23 calves showed non-fetid, greenish diarrhoea with small streaks of blood; mild to moderate dehydration and normal to mild (40°C) elevated rectal temperature with fair appetite 5-15 days after weaning and transportation. Systemic treatment with enrofloxacin (2.5 mg/kg daily for 3 days) was ineffective. Close physical examination revealed buccal cavity lesions on hard palate, beneath the tongue and muzzle. In 6 cases oral lesions without diarrhoea were observed. The oral and muzzle lesions were biopsied for histopathological examination.

One affected calf was euthanized due to poor condition one week post outbreak and necropsy was conducted.

Eleven days after the onset of the outbreak, 3 cases developed severe dysentery and dehydration. Perinums and tails of the calves were smudged with blood-stained diarrhoea, and straining was evident. But anaemia was not a feature.

Blood samples were collected from all affected calves for haematology. Faeces were examined for cryptosporidia using modified Ziehl-Neelson (Garcia et al., 1983) stained smears and for coccidia using centrifugal flotation (with salt) technique (Soulsby, 1982).

The collected faecal samples were cultured for salmonella by overnight enrichment of 2 g faecal samples in 20 ml of selenite broth, with subculture to Xylose-Lysine-Desoxycholate (XLD) agar and McConkey agar plates. After incubation for 24 hours at 37°C, suspected colonies were examined by routine biochemical tests (Sleigh and Duguid, 1989).

Pathological findings

Oral lesions: At first, the lesions were hyperaemic foci, 5 to 10 diameters across, on the inner aspect of the muzzle, gingivae, buccal papi
er and palate. After 5-7 days, the central lesions became ulcerated and papules were formed. In some cases, the ulcers were confluent and large ulcerations were visible with a reddish periphery. Fissures were evident and the tissue was much more prominent on the hard palate than in the oral cavity behind the incisors.

Microscopically, the epithelial lining was thickened and focal areas of ballooning degeneration was seen, with a clear cytoplasm, containing eosinophilic intracytoplasmic inclusions characteristic of bovine papular stomatitis.

Postmortem findings: The animal was emaciated. The hindquarters were stained, indicating a severe mucosal surface of the intestine.

Fig. 1: Marked edematous change in the intestinal mucosa, accompanied by intracytoplasmic eosinophilia (H&E) stain x 512.
Pathological findings

Oral lesions: At first, the lesions were recognized grossly as small hyperaemic foci, 5 to 10 diameter. These macules were seen on the muzzle, gingivae, buccal papillae, inner surface of the lips and hard palate. After 5-7 days, the center of these macules became elevated and papules were formed. In this stage, lesions appeared like a coin with a reddish periphery. Finally, the central zones were sloughed and eroded, leaving a craterous like lesions. Many of these lesions were confluent and large ulcers were formed. This type of lesion was much more prominent on the dental pad and the floor of the oral cavity behind the incisors.

Microscopically, the epithelium was hyperplastic and consisted focal areas of ballooning degeneration. In affected cells, nuclei were pyknotic with a clear cytoplasm. Many of these cells, contained eosinophilic intracytoplasmic inclusion bodies (Fig. 1), which were characteristic of bovine papular stomatitis.

Postmortem findings: The animal was cachectic and dehydrated and the hindquatres were stained with blood-stained diarrhoea. The mucosal surface of the intestines was oedematous and hyperaemic.

Fig. 1: Marked hydropic degeneration of epithelial cells of the stratum spinosum, accompanied by intracytoplasmic inclusion bodies (arrows). Haematoxylin - eosin (H & E) stain x 512.
There were erosions with a fibrinonecrotic exudate and bleeding was an important finding.

Large intestines contained bloody fluid. These findings indicated a fibrino-haemorrhagic typhlocolitis. Microscopically, the epithelium of the caecal and colonic crypts was destroyed accompanied by a severe inflammatory reaction in the lamina propria. Sexual and asexual forms of coccidia were determined in affected zones (Fig. 2).

Fig. 2: Villous atrophy and destruction of intestinal glands associated with infiltration of inflammatory cells. Epithelial cells contain stages of the Eimeria life cycle (arrow). Haematoxylin - eosin (H & E) stain × 256.

Clinicopathological findings

*Haematology:* Haematological changes were not marked. Only, there were leukocytosis and neutrophilia in three cases and PCV were elevated above normal range in two cases.

*Microbiology:* Cultures of several samples of faeces of affected calves and intestinal contents and liver of the necropsied calf for recovery of salmonella was negative.

Faeces examination for cryptosporidia and coccidia was negative on day 6 of the outbreak. But on day 11, large number of oocysts (*Eimeria bovis* and *E. zureni*) were observed.

**Diagnosis and treatment**

On the basis of the clinical findings a diagnosis of concomitant papular stomatitis virus was made.

The calves were treated with dimidine (150 mg/kg daily) and were infused by intravenous lasalosid (50 mg) treatment protocol instituted in diarrhoeic calves favourably. The buccal lesions there were few lesions that...

The concurrent infection of calf has not been recorded in the bovine papular stomatitis intercurrent diseases cause. (Radostits et al., 1994). A papular stomatitis and bovine virus (Bohac and Yates, 1980).

On the other hand, field in cattle is immunosuppressed susceptibility to other common in this outbreak, it was not the diseases is the primary cause may have lowered the resistant calves to infection. In situations distinct pathogens caused a diagnosis may be confusing, complete clinical examination followed to arrive at the conclusion.

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*Bohac, J.G. and Yates, D.G., 1980.* papular stomatitis in...
Diagnosis and treatment

On the basis of the clinical, clinicopathological and histopathological findings a diagnosis of concurrent infection with coccidia and bovine papular stomatitis virus was made.

The calves were treated by intramuscular injections of sulphadimidine (150 mg/kg daily for 3 days) and severe dehydrated calves were infused by intravenous fluids. Healthy and newly weaned calves were fed lasalosid (50 mg/kg) in ration as prophylaxis. After treatment protocol instituted, no calf died and one week later, diarrhoeic calves favourably responded to sulphadimidine administration. The buccal lesions began to regress and after one month, there were few lesions that did not affect the health of the calves.

Discussion

The concurrent infection of coccidiosis and bovine papular stomatitis has not been recorded in the literature. It has been stated that the bovine papular stomatitis virus may only cause lesions when intercurrent diseases cause lowering of the animals resistance (Radostits et al., 1994). A concurrent infection of bovine papular stomatitis and bovine virus diarrhoea has been described in a calf (Bohac and Yates, 1980).

On the other hand, field observations suggest that coccidiosis in cattle is immunosuppressive which may increase their susceptibility to other common infections (Roth et al., 1989). However, in this outbreak, it was not possible to determine, which of the two diseases is the primary cause, but weaning and transportation stress may have lowered the resistance and increased susceptibility of the calves to infection. In situations, where concurrent infection of two distinct pathogens caused stomatitis and diarrhoea, differential diagnosis may be confusing. It is recommended that in such cases complete clinical examination supported by laboratory tests be followed to arrive at the correct diagnosis.

References


H.A. Seifi and coworkers