An Outbreak of Concurrent *Histomonas meleagrisidis* and *Enterococcus fecalis* Infection in Ducks

A.N. Alkhalaif and O.M. Mahmoud

Department of Veterinary Medicine, Qassim University,
P.O. Box 1482, Buraydah, Qassim, Saudi Arabia

**Abstract:** Seventy four young ducks in a flock of about 300 birds, died of acute hemorrhagic enteritis within 15 days of appearance of the disease. Clinical signs were severe bloody diarrhea, weakness and dehydration. Fecal smears stained with Giemsa's stain showed presence of *Enterococcus* spp. and red blood cells. Gram stain showed the *Enterococcus* spp. occurred singly, in pairs and in short chains and were Gram positive. Postmortem examination showed patchy hemorrhages and ulceration in the small and large intestines as well as the caeca. No worms were seen in the caeca. The liver was enlarged and dark in colour. Histopathological examination showed haemorrhages and mucosal erosion and ulceration in the small and large intestines as well as liver cell necrosis. The intestine mucosa and submucosa contained *Histomonas meleagrisidis*. The liver also contained *Histomonas meleagrisidis*, occurring singly or in clusters, with its characteristic (double-eyed) structure. It was concluded that the severity of infection of this outbreak was attributed to the concurrent effect of both *Enterococcus* and *Histomonas* infections.

**Key words:** Concurrent infection, histomoniasis, *Enterococcus* infection, ducks

INTRODUCTION

*Enterococcus fecalis* is a gram positive bacteria that occurs singly, in pairs or short chains (Saif, 2001). It is a common inhabitant of the small intestine of ducks and very resistant to macrolide and lincosamide antibiotics (Suikia et al., 1995). It causes a wide syndrome of clinical signs and in the acute disease may cause lesions in the intestine, heart, liver and airsacs in ducks (Sandhu, 1988).

*Histomonas meleagrisidis* is usually transmitted by the caecal worm *Heterakis gallinae* (Saif, 2001). However direct transmission can occur. McDougald and Fuller (2005) confirmed that histomoniasis can be transmitted readily from directly exposed young turkeys to other in absence of the caecal worm vector. Direct transmission of *Histomonas meleagrisidis* through a flock has also been proved to occur through normal contact between uninfected birds and infected ones in the total absence of caecal worms by Hue and McDougald (2003).

Concurrent infections have been reported to augment the clinical effect of Histomonas infection. It has been shown that and 6% increase in mortality rate and 11% decrease in egg production in free-range layer hens was attributed to concurrent infection with *Histomonas meleagrisidis* and *Brachyspira* like bacteria (Esquenat et al., 2003). McDougald and Hue (2001) showed that blackhead disease (caused by *Histomonas meleagrisidis*) was aggravated in broiler chickens by concurrent infection with caecal coccidiosis. They concluded that this dual exposure may contribute to increase clinical outbreaks of blackhead disease in chickens under field conditions.

We report an outbreak farm characterized by high mortality in young birds with concurrent infection with *Histomonas meleagrisidis* and *Enterococcus* spp. occurred in a duck farm at Qassim, central Saudi Arabia in absence of the known intermediate host *Heterakis gallinae*.

**Corresponding Author:** A.N. Alkhalaif, Department of Veterinary Medicine, Qassim University, P.O. Box 1482, Buraydah, Qassim, Saudi Arabia
MATERIALS AND METHODS

Ten ducks that died of acute haemorrhagic enteritis were presented to the Pathology Department, Qassim University at Buraydah, Saudi Arabia to investigate the cause of death. The disease occurred during December 2005. Fecal samples were examined for presence of worm parasites. Smears from feces were also stained with Giemsa and Gram stains.

Organs showing lesions were fixed in 10% formol-saline and processed for routine histopathology.

Smears were made from feces of clinically ill birds and stained with Giemsa and Gram stains. The bacterium was identified as described by Cowman (1985).

RESULTS

The farm contained about 300 ducks of different ages. They reared on a semi-intensive system of production and fed a commercially prepared food. Water is offered at lib.

The disease appeared suddenly with profuse bloody diarrhea, prostration and dehydration. Death occurred suddenly in some birds but most affected ducks died within a period of 1-10 days from appearance of symptoms.

Examination of wet mounts of feces showed no worm parasites. Fecal smears stained with Giemsa's stain showed red blood cells and enterococci occurring singly, in pairs or short chains of 3-5 cocci (Fig. 1a). Fecal smears stained with Gram stain showed gram positive enterococci. The enterococci were almost in pure form and stained positive with Gram stain (Fig 1b).

Postmortem examination showed the extensive ulcerative haemorrhagic enteritis. The liver is dark in colour and swollen. There was congestion of kidneys and haemorrhages in the heart. The lungs were normal.

Histopathological examination showed haemorrhagic enteritis and shedding of the intestinal mucosa. Histomonas meleagridis had been shown to infect almost all the in the intestinal mucosa and submucosa (Fig. 2). Histomonas meleagridis was also seen in the liver as singly or in aggregates (Fig. 3). The liver parenchyma was largely destroyed and coagulative necrosis is evident on those remaining cells. Histomonas meleagridis in the intestine and liver had the typical diagnostic feature known as double-eyed lesion. The liver cells were necrotic and fatty degenerated and the parenchyma was infiltrated with inflammatory cells.

![Image](image_url)

Fig. 1a: Fecal smear showing red blood cells and single, pairs and short chains of Enterococcus spp. Giemsa stain x1000
Fig. 1b: Fecal smear showing Gram positive single, pairs and short chains of Enterococcus spp. Gram stain x1000

Fig. 2: Section of infected intestine showing Histomonas meleagrisidis inside enterocytes, H and E x 400

Fig. 3: Section of liver showing Histomonas meleagrisidis (black arrows) and necrotic liver cells (white arrows). H and E x 400
DISCUSSION

The researchers are not aware of a previous report describing concurrent Histomonas and Enterococcus infection in ducks. The high mortality experienced in the above reported outbreak was attributed to the concurrent Enterococcus infection of the intestine and Histomonas infection of intestine and the liver.

Concurrent infections in the avian species have been reported to aggravate the main clinical disease and increase mortality. Previous reports have shown that the clinical effects of Histomonas infection has been aggravated by concurrent infection with the protozoan Eimeria (McDougal and Hue, 2001) and by infection with a pathogenic bacterium (Esquenat et al., 2003).

The rapid spread of the above disease in the duck flock and the high incidence of mortality denoted a direct transmission of infection. Transmission of Histomonas meleagridis is known to occur through the worm _Heterakis gallinarum_. In the above outbreak we have not seen this caecal worm in any of the postmortem ducks. Many recent studies showed that both Histomoniasis and Enterococcosis could be transmitted by direct contact (McDougal and Fuller, 2005; Saif, 2001).

In conclusion the present research shows that concurrent infection of Histomonas spp. and Enterococcus spp. can result in a severe disease in ducks. Histopathological examination of infected liver and intestine is to be supported by microbiological investigation to give a diagnosis for the mixed infection.

REFERENCES


