

Caecal Coccidiosis in Layers

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Abstract

In a commercial layer farm, caecal coccidiosis was diagnosed by clinical signs, necropsy, faecal examination and microscopic lesions in caecum. The clinical signs like dullness, ruffled feathers, pale combs, anaemia, reduced weight gain and bloody droppings were noticed in the sick birds. Pale, dehydrated and emaciated carcass was observed on postmortem examination. Grossly, enlarged and distended caeca with haemorrhagic spots on the wall, blood clots in the lumen and necrotic patches on the mucosa were noticed. Faecal examination revealed presence of numerous ovoids, unsporulated Eimeria tenella oocysts in the faecal smear. Microscopically, sections of caecum with Haematoxylin and Eosin staining showed various developing stages of Eimeria tenella in submucosa, degenerating, desquamating enterocytes and infiltration of heterophils and mononuclear cells in submucosa.

Keywords: Caecal coccidiosis, *E. tenella*, Haematoxylin & Eosin, Layers, Oocysts

Introduction

Coccidiosis is one of the most important diseases of poultry worldwide. It occurs due to ingestion of oocysts which are shed in the faeces of infected chicken and undergo sporulation in the environment. Chickens of all ages and breeds are susceptible to coccidiosis but layer pullets are at greatest risk because they are kept on litter for more than 20 weeks and hence the number of oocysts in the litter rises rapidly due to short prepatent period of the parasite. Oocysts are resistant to environmental extremes and disinfectants and survive in soil for many weeks (Vegad and Katiyar, 2001). Various species of coccidia infecting chicken among which *Eimeria tenella* is one of the most pathogenic species in chickens. It inhabits the caeca and clinically it is characterized by bloody droppings, high mortality, reduced weight gain and emaciation (Hadipour *et al.*, 2011). One of the experimental study in Bangladesh revealed more prevalence percentage of coccidiosis in younger birds (47.5%) aged 5 to 6 weeks than older birds (10%) aged more than 16 weeks of age and they also reported that females showed slightly higher prevalence (37.70%) than males (32.22%) to coccidiosis (Belal, 2017). The present study describes the characteristic clinical signs, gross and microscopic lesions in caecum of layer birds affected with *E. tenella* in a commercial farm.

Materials and Methods

A sudden mortality was observed in a commercial layer farm and caecal coccidiosis was diagnosed upon postmortem lesions, faecal analysis and microscopic examination. The clinical signs shown by the sick layer birds were recorded. Necropsy of the dead birds was performed and gross lesions were noted. For preparation of faecal smears, a small quantity of faeces was placed on to a clean glass slide, then few drops of water were added and mixed thoroughly, covered with a cover slip and then directly examined under microscope. At necropsy, pieces of caecum were collected in 10% neutral buffered formalin (NBF) for histopathological examination. Tissue pieces were allowed to fix in neutral buffered formalin for 24 hours and then washed for overnight under running tap water. The tissue was dehydrated in ascending grades of alcohol, cleared in xylene and embedded in liquid paraffin. The sections of 5 µm were cut from paraffin blocks using microtome and sections were stained with haematoxylin and eosin as per the standard protocol (Luna, 1968), then mounted with dibutylphthalate polystyrene xylene (DPX), allowed to dry and examined under light microscope.

Results and Discussion

Caecal coccidiosis was diagnosed in commercial layer farm based on the history, postmortem examination of the dead birds, faecal smear and histopathological examination of the caeca.

Clinical Signs

The sick birds showed clinical signs like dullness, ruffled feathers, pale combs, anaemia, decrease in body weight gain, blood in droppings and sudden death. Similar symptoms were earlier reported by few researchers (McDougald & Fitz-Coy, 2008; Shiferaw, 2006; Sawale *et al.*, 2018; Hamid *et al.*, 2018)

Gross Lesions

On necropsy, dehydrated and emaciated carcass was observed with pale musculature. The caeca were severely enlarged and distended with haemorrhagic spots on the wall (Fig. 1). On cut section, blood clots were noticed in the caecal lumen (Fig. 2). In few birds, the caecal contents were consolidated, dry and necrotic patches were seen on the mucosa. These findings are in accordance with Hamid *et al.*, 2018.

Faecal Examination

Numerous oval shaped, thick walled, unsporulated *Eimeria tenella* oocysts were observed in faecal smear (Fig. 3).

Histopathology

Microscopic sections of caecum revealed various developing stages (schizonts and oocysts) of *Eimeria tenella* in submucosa, degeneration, desquamation of enterocytes and infiltration of heterophils and mononuclear cells (Fig. 4) in submucosa. These observations are in conformity with the earlier reports (Sood *et al.*, 2009; Debbou-Iouknane *et al.*, 2018; Hamid *et al.*, 2018).



Figure 1: Layer bird affected with caecal coccidiosis showing severely enlarged, distended caeca and haemorrhagic spots on the wall.



Figure 2: Blood clots in the caecal lumen of layer birds affected with caecal coccidiosis.

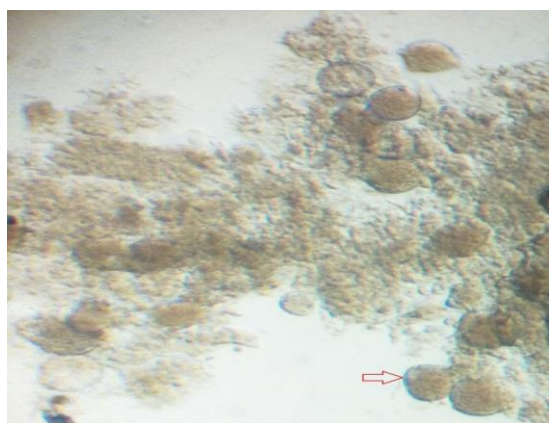


Figure 3: Faecal smear showing oval shaped, thick walled, unsporulated oocysts of *Eimeria tenella* (arrow) in coccidiosis (x 20).

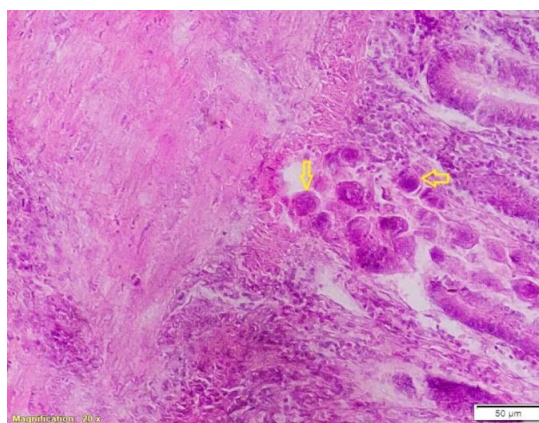


Figure 4: Section of caecum showing various developing stages of *Eimeria tenella* in submucosa (arrow) and degeneration and desquamation of enterocytes in coccidiosis (H&E x 20)

Coccidiosis is one of the economically important parasitic diseases in poultry due to its high morbidity, mortality and poor feed conversion rate. Worldwide losses due to coccidiosis in poultry were estimated as 2.4 billion US dollars per annum (Shirley *et al.*, 2005). In present study, the damp litter with high moisture content may have favoured the sporulation of oocysts of coccidia as earlier reported by few researchers (David, 2000; Waldenstedt *et al.*, 2001). Avian coccidiosis can be effectively controlled by good management practices like isolation of the affected birds, avoiding overcrowding, wet litter and inadequate ventilation in the farm and using coccidiostats in the ration.

Conclusion

The present study describes in detail about the clinical signs, gross and microscopic lesions in layer birds affected with caecal coccidiosis. Even though several anticoccidial drugs were available in the market, the coccidiosis is still prevalent in all over the world and the economical losses due to it can be minimized by practicing good hygiene and biosecurity measures.

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Conflict of Interests

There is no conflict of interest.

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