



Occurrence of Intestinal and Caecal Coccidiosis in Rajasri Birds

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ABSTRACT

Coccidiosis in poultry is still considered as one of the main diseases affecting performance of poultry reared under intensive production systems. Coccidiosis was diagnosed in Rajasri birds upon routine postmortem examination conducted at Department of Veterinary Pathology, College of Veterinary Science, Hyderabad. PM examination of 423 birds conducted during a period of one month, out of which 136 birds were diagnosed with intestinal coccidiosis (32.15%) and 120 birds with caecal coccidiosis (28.36%). Clinically birds showed weakness, somnolence, ruffled feathers, pale comb, mucoid bloody diarrhea and death. Coccidiosis was initially diagnosed on the basis of faecal smear examination and histopathological alterations in intestines. Gross examination of birds showed pale muscle, dehydrated and emaciated carcass. Extremely ballooned intestine and caeca and haemorrhages in intestinal mucosa were seen. Upon opening of the small intestines and caeca, watery ingesta mixed with mucus and blood was observed. Faecal smears made from duodenum, jejunum, ileum and caecum revealed coccidial oocysts. Histopathological examination of intestine and caecum revealed coccidia lifecycle stages with destruction of different layers of the intestine and caecum with infiltration of heterophils and mononuclear cells (MNC).

Keywords: Coccidiosis, small intestine, caeca, haemorrhagic enteritis, rajasri

Avian coccidiosis is a huge problem worldwide. Coccidiosis is caused by species of intracellular protozoan parasites belonging to the genus *Eimeria* (Shirley, 1995). It causes substantial economic losses due to malabsorption, bad feed conversion rate, reduced weight gain and increased mortality. In addition, the use of anticoccidial drugs and/or vaccines for treatment and prevention, contributes a major production cost. In the domestic fowl *Gallus gallus*, nine *Eimeria* species are recognized: *E. brunetti*, *E. maxima*, *E. necatrix* and *E. tenella* are highly pathogenic, *E. acervulina*, *E. mitis* and *E. mivati* are rather less pathogenic, and *E. praecox* and *E. hagani* are regarded as the least pathogenic (Thebo *et al.*, 1998). The *Eimeria* cycle includes two distinct phases; (a) the internal phase (schizogony + gamogony) in which the parasite multiplies in different parts of the intestinal tract and the oocysts are excreted in the faeces (The part of the intestinal tract and the total duration of the internal phase

of the cycle is dependant on species), (b) the external phase (sporogony) during which the oocyst must undergo a final process called sporulation before they are again infective. Sporulation requires warmth (25-30°C), moisture and oxygen (Levine, 1973). Sporulated oocysts can be spread mechanically by wild birds, insects or rodents and via contaminated boots, clothing, equipment or dust. Direct oral transmission is the natural route of infection (Mc Dougald, 2003). Bad management (such as wet litter that encourages oocyst sporulation, contaminated drinkers and feeders, bad ventilation, and high stocking density) can exacerbate the clinical signs (Ruff, 1993).

Avian coccidiosis is classified into caecal and intestinal forms. The lesions of coccidiosis depend on the degree of

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inflammation and damage to the intestinal tract. Grossly extremely ballooned intestine and caeca, mucoid to blood tinged exudates, petechial hemorrhages, necrosis and hemorrhagic enteritis can be seen (Adamu *et al.*, 2013; Sharma *et al.*, 2015). The tissue damage in the intestinal tract may allow secondary colonization by various bacteria, such as *Clostridium perfringens* (Helmboldt and Bryant, 1971). Infestation with *E. tenella* also increases the severity of *Histomonas meleagridis* infection in chickens (Mc Dougald and Hu, 2001). Microscopically, disruption of mucosa, clusters of developing and developed oocysts, marked haemorrhage, necrosis of the mucosa and massive infiltration by heterophils and mononuclear cells are characteristic (Amer *et al.*, 2010; Sharma *et al.*, 2015).

The present paper discusses occurrence of intestinal and caecal coccidiosis in Rajasri birds. A detailed faecal, gross and microscopic pathology intestinal and caecal coccidiosis was discussed.

MATERIALS AND METHODS

A sudden mortality in Rajasree birds was reported at Poultry Research Station (PRS) Rajendranagar, College of Veterinary Science, Hyderabad. Intestinal and Caecal coccidiosis was diagnosed upon postmortem examination. The diagnosis of coccidiosis is based on clinical signs, coprology and morphological and histopathological analysis. The history and gross lesions were noted. Faecal smears from the various portions of the intestine and caecum were prepared by adding a small quantity of faeces on a clean microscope slide, mixed with a few drops of water thoroughly and covered with cover slip and examined under microscope. Intestine and caecal slices (1×1 cm³) were collected and fixed in 10% neutral buffered formalin (NBF) soon after necropsy. In brief, tissues were trimmed to 3 to 5 µm thickness and then dehydrated in different alcohol concentrations (70, 80, 95 and 100%). The processed tissues were cleared in xylene and embedded in paraffin for preparation into fine blocks. Blocks were sectioned with microtome to a size of 5 µm; afterwards they were dewaxed and the tissue sections were stained using haematoxylin and eosin (H and E) stain (Luna, 1968). The slides were mounted with dibutylphthalate polystyrene xylene (DPX) and allowed to dry before examination under a light microscope.

RESULTS AND DISCUSSION

Coccidiosis was diagnosed in Rajasri birds upon routine postmortem examination conducted at Department of Veterinary Pathology, College of Veterinary Science, Hyderabad. PM examination of 423 birds conducted during a period of one month out of which 136 birds were diagnosed with intestinal coccidiosis (32.15%) and 120 birds with caecal coccidiosis (28.36%). Clinically birds showed weakness, somnolence, ruffled feathers, pale comb (Fig. 1A), mucoid bloody diarrhea and death. Gross examination of birds showed pale muscle (Fig. 1B), dehydrated and emaciated carcass. Extremely ballooned intestines were noticed. Upon opening of the intestines, blood tinged contents were seen with thickening and severe haemorrhages on the mucosa. Haemorrhagic enteritis was seen in whole portion of intestine (Fig. 1C). *E. tenella* was identified easily by its predilection site (caeca), which was enlarged with clotted blood, haemorrhagic spots on caecal wall, inflammation, necrotic patches and dilation of caecum with consolidation of caecal contents were observed in almost all the cases (Fig. 1D). Faecal smear examination prepared from duodenum, jejunum, ileum and caecum revealed presence of unsporulated ovoid oocysts of coccidia (Fig. 2A and 2B) making it confirmatory for coccidiosis. Histopathological lesions of intestine showed desquamation and sloughing of enterocytes leading to necrosis of intestinal villi with presence of shizont stages in the submucosa with infiltration of heterophils and MNC infiltration (Fig. 3A). Histopathological lesions of caecum revealed destruction of different layers of caecum with presence of oocysts and schizont stages in the submucosa and infiltration of heterophils and mononuclear cells (Fig. 3B).

Intestinal and caecal coccidiosis was diagnosed by faecal, gross and histopathological examination recorded in dead birds. Faecal samples revealed the presence of oocysts of intestinal and caecal coccidiosis. The gross necropsy changes revealed extremely ballooned intestines, haemorrhages, necrotic patches and dilation of intestine and caeca, some caeca showed consolidation of internal contents. Pale comb and muscle were due to anemia which could be resulted by extensive blood loss. Similar gross lesions of intestinal and caecal coccidiosis in chicken were reported by Adamu *et al.* (2013); Sharma *et al.* (2015), histopathological findings showed presence of oocysts and shizont stages in the submucosa which is in accordance



Fig. 1: Gross lesion in the coccidiosis. (A) Pale comb; (B) Pale muscle; (C) Ballooned intestines with blood tinged contents; (D) Enlarged caeca with clotted blood and haemorrhagic spots on caecal wall

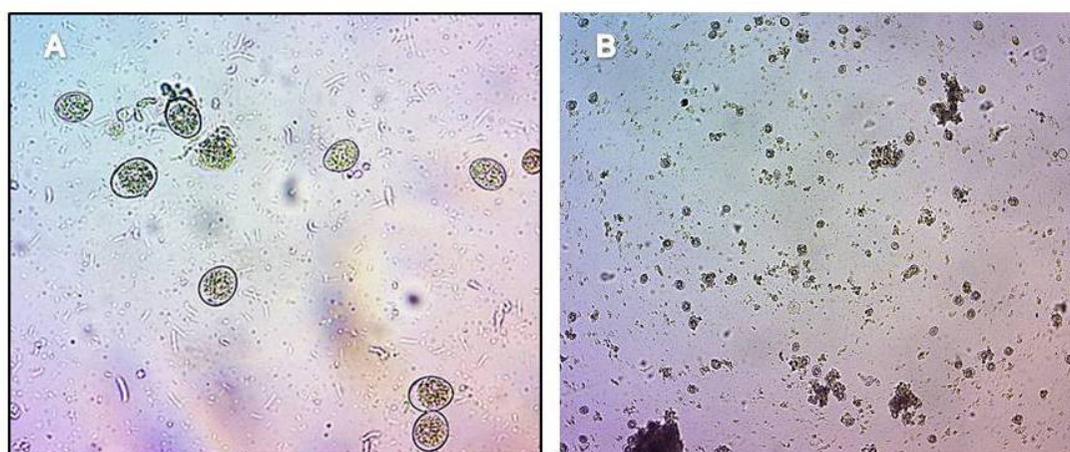


Fig. 2: Faecal sample smear from ileum and caecum. (A) Faecal smear from ileum showing unsporulated ovoid oocysts. x 400; (B) Faecal smear from caecum showing unsporulated ovoid oocysts. x100

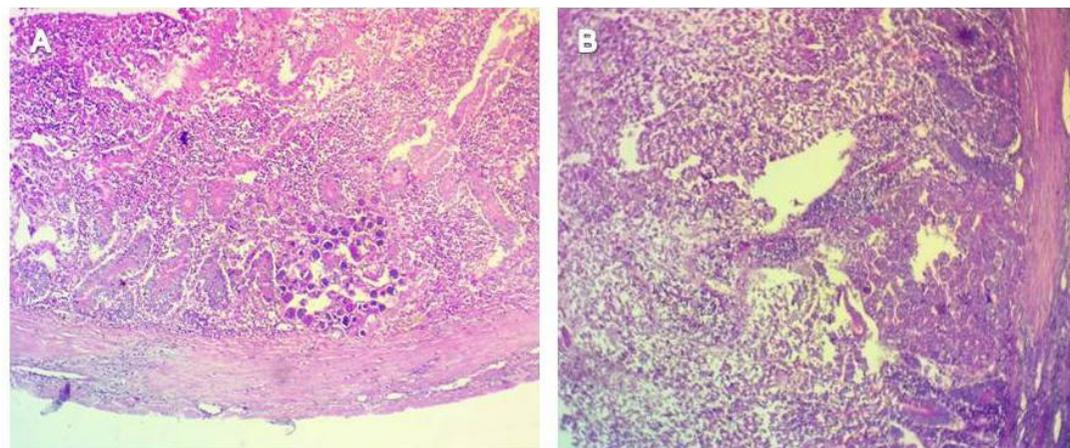


Fig. 3: Histopathological changes in the intestine and caecum. **(A)** Intestine section submucosa showing coccidial oocysts, shizont stages and mononuclear cell infiltration (H&E x100); **(B)** Section of caecum showing presence of shizont stages and mononuclear cell infiltration (H&E x100).

with the findings of Amer *et al.* (2010); Sawale *et al.* (2018).

CONCLUSION

In conclusion, after detailed faecal, gross and histopathology study, present paper describe the occurrence of intestinal coccidiosis in 136 birds (32.15%) was due to *E. necatrix* and caecal coccidiosis in 120 birds (28.36%) was due to *E. tenella* in a 19 weeks old Rajasri birds over one month of period. A detail faecal examination; gross and histopathology study in intestinal and caecal coccidiosis has been described.

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