www.ajbrui.org

*Afr. J. Biomed. Res. Vol. 23 (January, 2020); 127- 129*

*Case Report*

# Fatal Outbreak of Eimeriosis in a Rabbitry In Ibadan, Nigeria

**Omadevuaye T.O., Jarikre T.A., Gurumyen G.Y., Anike W.U., Adekola A. and *Emikpe B.O.**

*Department of Veterinary Pathology, Faculty of Veterinary Medicine, University of Ibadan, Nigeria*

**ABSTRACT**

This report investigates an outbreak of coccidiosis in a rabbitry in Ibadan, Nigeria. The rabbits were raised in a commercial breeder rabbitry with a total stock of 700 rabbits. The duration of mortality was 5 days, with an average of 140 rabbits per day giving a total of 635 (85%) mortalities. Clinical signs, necropsy findings, cytological, Histopathological and confirmatory diagnosis were reported and discussed. This case report further showed that coccidiosis in rabbitry is still a serious problem which should be monitored and controlled.

**Keywords:** *Coccidiosis, Eimeria, Rabbit, Outbreak, Diagnosis, Nigeria*

*Author for correspondence: *E-mail*: *banabis2001@yahoo.com;* Tel. +234-8066486080

*Received: September 2018; Accepted: June, 2019*

***Abstracted by:***

*Bioline International, African Journals online (AJOL), Index Copernicus, African Index Medicus (WHO), Excerpta medica (EMBASE), CAB Abstracts, SCOPUS, Global Health Abstracts, Asian Science Index, Index Veterinarius*

## INTRODUCTION

Coccidiosis is a contagious protozoal disease of rabbits (Darwish and Golemansky 1991). It is caused by *Eimeria* sp., and different species have been reported to parasitise rabbits, with majority localizing in the gut (Soulsby 1968, Barriga 1979, Levine 1985). The organisms enter the intestinal mucosal epithelial and cryptal cells. The individual species are host and tissue specific (Brooks 1979, Percy and Barthold 2007). *E stiedae* infects domestic rabbits globally (Vargar 1982, Al-Mathal *et al* 2008). Despite the worldwide distribution of the disease, the report in Nigeria is scanty. This case report presents the investigative outcomes of an outbreak of coccidiosis in a rabbitary in Ibadan, Nigeria.

## CASE PRESENTATION

Three female rabbits of mixed breeds between the ages of 2-6 months of age were presented for necropsy to the Diagnostic Laboratory, Veterinary Teaching Hospital, University of Ibadan. The rabbits were raised in a commercial breeder rabbitary with a total stock of 700 rabbits. Some of the rabbits on the farm were being used for an ongoing breeding research while the rest were raised for breeding and commercial purposes. 48 additional rabbits were purchased on July 8th, 2016 and were quarantined on the farm. A week later (July 14th, 2016), mortality started on the farm. On the first day of the mortality (14th of July), 4 rabbits were found dead while 11 died the next day. The mortality rapidly spiked to 120 on 16th July, 2016 while 300 and over 200 rabbits were found dead on the 17th and 18th July, respectively. The duration of mortality was 5 days, with an average of 140 rabbits per day giving a total of 635 (85%) mortality.

At the onset of mortality on the farm, the appetite of the rabbits was normal and no obvious clinical signs were observed until about one hour prior to death when they become weak and subsequently die.

At necropsy, the carcasses were fresh but slightly emaciated. The mucous membranes (ocular and oral membranes) were moderately pale. There was moderate congestion of the dorsal turbinate and ecchymotic haemorrhages on the ventral and distal parts. There was also moderate hyperaemia of the trachea mucosa with reddish froth extending into the cut portion of the lungs. The lungs were mildly congested and moderately consolidated with the right lungs being more affected. The liver was friable, with a few multifocal raised white nodules (plate 1) of varying sizes on the dorsal and the ventral aspects of the liver. These nodules oozed out creamy exudate. There was moderate congestive splenomegaly. There were mild petechial haemorrhages on the mucosa of the caecum. There was capsular adhesion and roughening of the renal cortex with marked multifocal petechial to ecchymotic hemorrhages on the cortical and cut surfaces of the kidney.

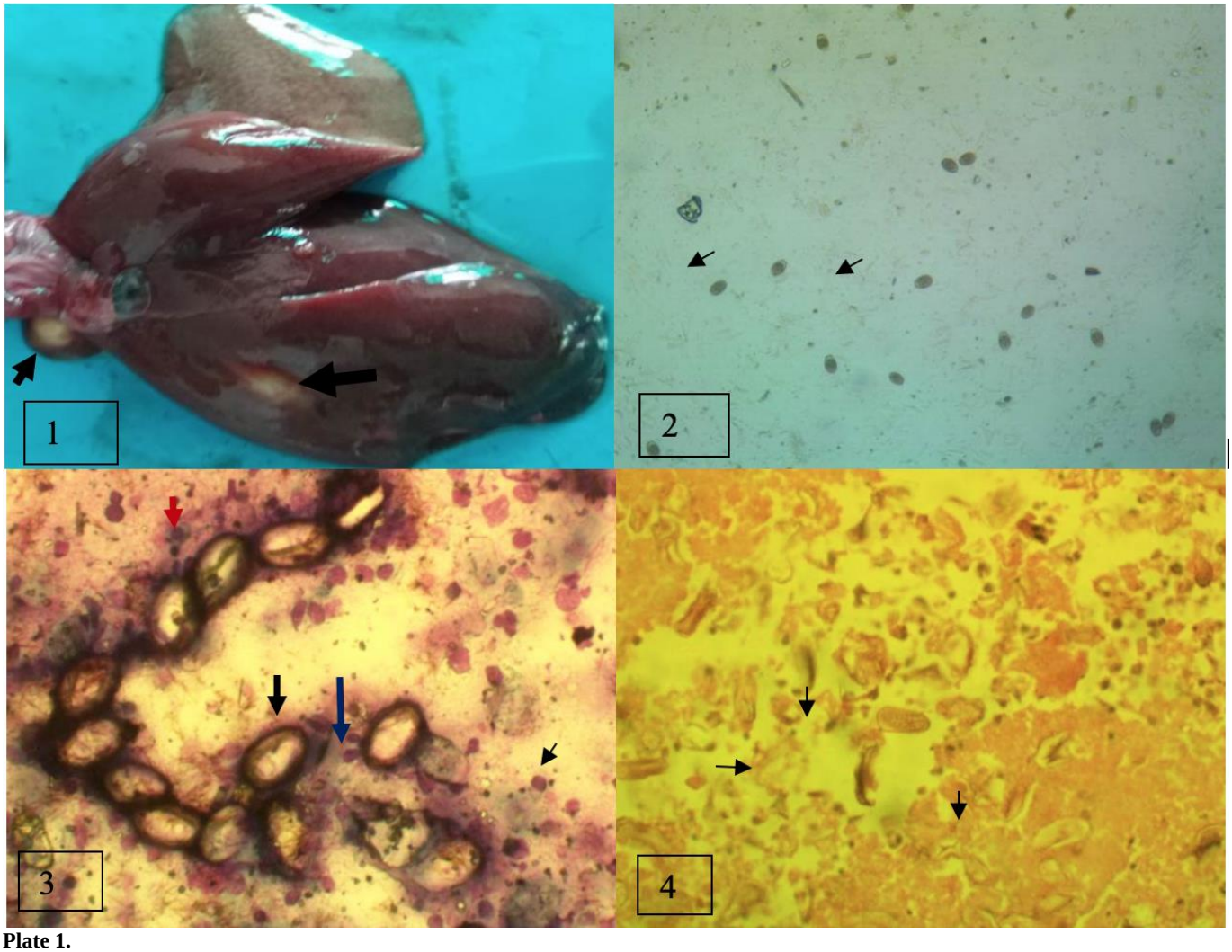


**Plate 1.**
The liver has multifocal raised whitish nodules of varying sizes on the dorsal and the ventral surfaces (arrows). 2. Eimeria oocysts (arrows) from wet mount intestinal scrapings. x400. 3. *Eimeria* oocytes (arrows) at different stages of development from liver impression smears. Giemsa stain x1000. 4. Degenerate to necrotic bile duct epithelium, flooded by inflammatory cells and intralesional eimeria oocysts (arrows). HE x400

The femoral bone marrow was solid and reddish along the entire length while there were widespread meningeal congestion and haemorrhages extending from the distal part of the cerebrum towards the cerebellum.

Microscopic examination of wet mount intestinal scrapings (duodenum and caecum) revealed 15–20 oocysts per HPF (plate 2) consistent with the morphological appearance of *Eimeria stiedae.* The Giemsa stained liver impression smears revealed abundant *Eimeria* oocytes at different stages of development. There were abundant degenerate, necrotizing and regenerative hepatocytes (evidenced by the hyperplastic and binucleated hepatocytes with basophilic cytoplasm). There were also numerous biliary epithelial cells and within a biliary epithelial cell is a macrogametocyte. There were abundant inflammatory cells composed chiefly of lymphocytes, macrophages and few heterophils.

At histopathology, there were multifocal areas of coagulation necrosis of hepatic parenchyma. The bile ducts were tortuous, proliferative and severely distended (up to 4 mm), compressing the limiting hepatic plate and moderate fibrosis. There was a large vacoule representing nodule and ectatic bile ducts. There were abundant degenerate to karyorrhectic, karyolytic, or pyknotic nuclei (necrosis) epithelial cells bordered by inflammatory cells. Most of the degenerate epithelia show eimeria oocyst in different stages of gametogony. The morphometry of the oocysts were in range of 20-50 um in diameter. There was severe inflammatory cell infiltrates in the portal area and around necrotic hepatocytes and bile ductules.

## DISCUSSION

This case report describes the pathological changes associated with fatal coccidiosis in rabbits for the first time in our environment. The peculiarity of the case is the 85% case fatality of coccidiosis in a rabbitry.

Two anatomic forms coccidiosis includes enteric and hepatic occur in rabbit. *The* enteric eimeria *include E perforans, E. magna, E. media*, and *E. irresidua*, while *E.*

*steidae* induces hepatic lesions (Darwish and Golemansky 1991).

*Eimeria stiedae* colonizes the bile ductles resulting in morbidity and losses in rabbitries (Aly 1993). Infection of either forms of the parasite is through ingestion of feed and water conataining sporulated oocysts. The severity of the lesions are more in caged or intensively managed and young rabbits (Cheeke 1987, Varga 1982, Al-Rukibat 2001).The influence of age on the severity of coccidiosis was reported by Al-Mathal (2008). The managemental system would have contributed to the infection, spread and fatality in this case. Oocysts of *E. stiedae* sporulate within three days in the faeces. On ingestion the parasite stages invade the mucosa of the duodenum, before migrating to the liver (River 2016). The parasitic stages have predilection for the bile duct epithelium in the liver, undergoing asexual and sexual multiplication before shedding in the faeces. During these divisions and multiplication in the liver, the parasitic stages induce severe necrosis and hyperplasia of bile ductular epithelium, suppurative to pyogranulomatous hepatitis (Brown et al 2007, Lacey 2016). This was observed as severe bile ductular and hepatocellular injury in the rabbits in this case.

The presence of small yellowish white nodules of varying sizes on the hepatic parenchyma is very much suggestive of hepatic coccidiosis (Brown et al 2007, Percy and Barthold 2007). The nodules comprising hypertrophied bile ducts or gall bladder and degenerate epithelial cells with presence of the oocytes and gamete stages is characteristic of hepatic cocciosis (Gardiner et al 1998, Percy and Barthold 2007).

The mortality of 85% recorded in this outbreak of coccidiosis is unique. It was higher than the 9% and 5% of morbidity and mortality respectively reported by Meek (1943*)*, 48% (Cheeke 1987), and 64% (Pakes et al 1994 ). There was 40% and 80% mortality in young rabbits in an experimental infection (Percy and Barthold 2007). Diagnosis and confirmation of hepatic eimeriosis is usually based on histopathology and characteristic intra-lesional oocysts in the liver.

In conclusion, coccidiosis in rabbitry is still a serious problem which should be monitored and controlled.

**Ethical approval:** "All applicable international, national, and/or institutional guidelines for the care and use of animals were followed."

## REFERENCES

**Al-Mathal E.M..(2008):** Hepatic Coccidiosis of the Domestic Rabbit *Oryctolagus cuniculus domesticus L*. in Saudi Arabia. World Journal of Zoology 3 (1): 30-35

**Aly M..M. (1993):** Development of *Eimeria stiedae* in a non-specific host. J. Egypt. Soc. Parasitol., 23 (1): 95-99.

**Brooks DL. (1979):** Coccidiosis—life cycle and other rabbit parasites. *Proc Rabbit Health Symp*. 1(1):1-13.

**Brown C.C., Baker D.C. and Barker I.K. (2007):** The alimentary system. In: Maxie MG, ed. *Jubb, Kennedy, and Palmer's Pathology of Domestic Animals*. Vol 2. 5th ed. Philadelphia, PA: Saunders Elsevier. 260-270,363-364.

**River C. (2016):** "Rabbit coccidiosis". Archived from the original on 14 March 2016. Retrieved 27 June 2016.

**Cheeke P.R. (1987):** Nutrition-disease interrelationships. In: *Rabbit Feeding and Nutrition*. Orlando, Fla: Academic Press; 176-200.

**Darwish, A.I. and Golemansky V (1991):** Coccidian Parasites (Coccidia: Eimeriidae) of domestic rabbits (*Oryctolagus cuniculus L*.) in Syria. Acta Protozool., 31: 209-216.

**Gardiner C.H., Fayer R., and Dubey J.P. (1998):** *An Atlas of Protozoan Parasites in Animal Tissues*. 2nd ed., Washington, DC: Armed Forces Institute of Pathology. 20-30.

**Lacey J. (2016):** "Fall 2000 Newsletter - Final Diagnosis - Hepatic coccidiosis". Indiana Animal Disease Diagnostic Laboratory. Retrieved 27 June 2016.

**Meek M.W. (1943):** Coccidiosis in domestic rabbits. In: *Diseases and Parasites of Rabbits and Their Control*. 3rd ed. Montebello, Calif: Reliable Fur Industries; 79-115.

**Pakes S.P., and Gerrity L.W. (1994):** Protozoal diseases. In: Manning PJ, Ringler DH, Newcomer CE, eds. *The Biology of the Laboratory Rabbit*. 2nd ed. San Diego, Calif: Academic Press; 205-229.

**Percy D.H., and Barthold S.W. (2007):** *Pathology of Laboratory Rodents and Rabbits*. 3rd ed. Ames, IA: Blackwell Publishing; 288-290.

**Sanyal P.K. and Sharma S.C. (1991).** Clinicopathology of hepatic coccidiosis in rabbits. Indian. J. Anim. Sci., 924-928.