A Note on Incidence of Coccidiosis in Japanese Quail (Coturnix coturnix japonica)

P. Anbarasi, G. Ponnudurai, K. Senthilvel, B. Puvaran and A. Arulmozh

Department of Veterinary Parasitology, Veterinary College and Research Institute, Namakkal – 637 002.

(Received : 14-01-2014; Accepted : 13-04-2015)

Abstract

An investigation was made to determine the parasitic infections in Japanese quails (Coturnix coturnix japonica) maintained in commercial farms in Namakkal and Coimbatore districts. In this study 76 faecal samples were collected from three different farms and processed by sedimentation and floatation methods. Examination revealed that 12 samples were found to be positive for mixed infections of Eimeria spp. Based on the morphometry of the oocyst and time taken for sporulation time, they were identified as E. tsunodai, E. uzura and E. bateri. In order to study the pathology of Eimeria spp in Japanese quails, two Japanese quails were purchased from affected flock and slaughtered, gross and histopathological changes were observed.

Key words: Japanese quails, Coccidiosis, Eimeria spp

Coccidiosis is one of the major parasitic diseases in various avian species. This parasitic infection occurs in the intestine, it results in great economic losses all over the world. Quails which consider a branch of the modern poultry industry. However, few published studies were available on quail diseases. These birds are raised primarily for production of eggs, meat and used as laboratory animals similar to rat and mice. Among the avian diseases, coccidiosis affects bird development as well as production. Coccidiosis is very often a hidden disease and necrotic enteritis or collicibacillosis develop as a secondary infection.

The presence of non specific clinical symptoms or unidentified mild clinical symptoms prevent the correct diagnosis. In such cases, asymptomatic conditions may adopt subclinical and chronic forms (Teixeira et al., 2004). Nowadays, quail coccidiosis and control measures become a major problem in all countries (Melhorn, 2008).

Several species of Eimeria were reported from the different species of Japanese quail in different countries such as Eimeria coturnica from Coturnics coturnix coturnix, E. tsunodai, E. uzura and E. bateri from Coturnics coturnix japonica in India (K. Senthivel and Madhavan pillai, 1996) and E. tsunodai, E. uzura from Coturnics coturnix japonica in Japan (Teixeira et al. (loc.cit)). Other Eimeria species has been described in the United states (Duszynski, and Gutierrez, 1981) and in Saudi Arabia (Bashtar et al., 2010). The present investigation deals with the prevalence of Eimeria spp infections in domesticated quails in Namakkal district, Tamil Nadu.

Materials and Methods

In this study, 76 fresh faecal samples were collected from three commercial rearing farms which are located in Namakkal and Coimbatore districts. The faecal samples were processed by sedimentation and floatation techniques for the presence of oocysts (K. Senthivel and Madhavan pillai, (loc.cit)). The positive samples were suspended in 2.5% potassium dichromate solution and kept at room temperature for sporulation of oocysts. The species were identified based on the morphometry of oocyst.

To study the pathological lesions caused by Eimeria spp in Japanese quails, two birds were purchased from infected farm for laboratory diagnosis. The faecal samples were examined for the presence of oocysts and the clinical signs were recorded. The birds were sacrificed to study the gross lesions in the intestine. Tissue specimens were collected for histopathological study and their sections were stained with...
Table I. Comparative morphology of *Eimeria* spp oocyst detected in the Japanese quails

<table>
<thead>
<tr>
<th>S.No</th>
<th>Characters</th>
<th><em>E. bateri</em></th>
<th><em>E. uzura</em></th>
<th><em>E. tsunodai</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Oocyst shape and size</td>
<td>Broadly ovoid</td>
<td>Oval in shape</td>
<td>spherical in shape</td>
</tr>
<tr>
<td></td>
<td>Oocyst size (μm)</td>
<td>22.3x16.76</td>
<td>21.48x18.23</td>
<td>17.23x16.31</td>
</tr>
<tr>
<td>2</td>
<td>a. Mean ± SIE</td>
<td>0.40±0.17</td>
<td>1.02±0.26</td>
<td>0.51±0.55</td>
</tr>
<tr>
<td></td>
<td>b. Range</td>
<td>19.8-23.4x16.5-19.0</td>
<td>19.4-23.1x17.8-19.0</td>
<td>14.8-18.4x13.9-17.8</td>
</tr>
<tr>
<td>3</td>
<td>Micropyle</td>
<td>Absent</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>4</td>
<td>Oocyst residuum</td>
<td>Absent</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>5</td>
<td>Sporocyst residuum</td>
<td>Present</td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>6</td>
<td>Steid body</td>
<td>Present</td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>7</td>
<td>Sporulation time</td>
<td>20-24 hrs</td>
<td>22-24 hrs</td>
<td>20-24 hrs</td>
</tr>
</tbody>
</table>

Haematoxylin and Eosin.

**Results and Discussion**

Out of the 67 Japanese quails examined during the study period, 12 samples quails were found to be positive for *Eimeria* spp. The oocysts appeared to be 3 types since they were of three different shapes namely broadly ovoid, oval or ellipsoidal and spherical. Three species were identified in naturally infected birds belonged to *Eimeria tsunodai*, *E. uzura* and *E. bateri* (Fig1). For each species 15 numbers of oocysts were measured. The measurements of each oocyst were compared with those *Eimeria* species of quails (Panda et al., 1988). These species could be differentiated based on the size by using ocular micrometer (Table I). Some *Eimeria* spp with similar morphology were excluded because of the differences in the size of the oocyst. The measurement of oocysts which was observed in this study were similar to findings of those described by Teixeira et al. (*loc.cit*) and Bashtar et al. (*loc.cit*).

According to the age, the infection rate of *Eimeria* sp was low in adult while it was high in young quails (less than 10 weeks). This result is agreement with studies carried out by Mcdougal, et al. (1997). This may be due to development of immunity in grown up quails. Panda et al. (*loc.cit*) and Mohammed, (2012) recorded that the highest rate of mixed infection with three species of *Eimeria* during their survey on quail coccidiosis. The present study concurs their observations. This result is not in agreement with the findings of Neema (2011). Who have observed differences between mixed infections, double infections and single infections. This might be due to many different factors such as

![Fig 1: Faecal sample showing the mixed infections of oocyst of Eimeria spp](image)

![Fig 2: Caeca showing the varying stages of Sbozoncts (100X magnification)](image)

The Indian Veterinary Journal (February, 2016)
farm management practices, contamination of food and drinking water with oocyst and different anticoccidial programs.

In this study, quails are found to be affected by subclinical form of coccidiosis. The infected quails had diarrhea which disappeared soon and sometimes blood spots and mucus were seen in the faeces. A subclinical form of this disease was confirmed by Teixeira et al. (loc.cit).

Necropsy revealed gross lesions of enteritis, congested intestine and filled with brownish contents. Microscopical examination of scrapings from intestine and revealed the presence of oocysts. Macroscopically the caeca dilated and showed petechial haemorrhage which may be due to *E. tsunoda*. These observations were similar to the findings of Mohammad. (loc.cit). While histopathological lesions characterized by presence of developmental stages of *Eimeria* spp in the intestine (Fig 2). On histopathology reveals that villous erosion degeneration, desquamation of intestinal epithelium.

Coccidiosis in Japanese quails remains a significant problem because coccidion are resistant to popular antiprotozoal drugs agents. Chronic diseases have adverse consequences on production. The findings of this study will help diagnosis of coccidiosis in other regions and there is a need for further research in this study.

References
Al-Neema, M.S. (2011) Diagnostic study on *Eimeria* species in chickens in Al-Hamdania region. (Master’s thesis). College of Veterinary Medicine, University of Mosul

Indian Veterinary Association (IVA) Corporate and Associate Membership
Organization, Institutes, Corporate, Society, companies, etc in India are eligible to become the corporate or associate member of the Indian Veterinary Association.

The members will be invited to attend the GB/EC meetings of IVA. Proceeding of the meeting will be sent to the members. They will also receive complementary copies of the Indian Veterinary Journal and other IVA publications free of charge for 10 years.

Corporate membership fee (one time payment) is ₹ 75,000/-.

Associate membership fee (one time payment) is ₹ 37,500/-.

Fee payable through bank draft in the name of Indian Veterinary Association payable at New Delhi.

**For more details and application form please contact:**
Dr R.S. Sharma, LMIVA, President, Indian Veterinary Association
27- Gayatri Nagar “B” Maharani Farm, Durgapura, Jaipur -302018
Phone : 0141-2760672, Mobile : 09413341683, Email : drsharmars@gmail.com

The Indian Veterinary Journal (February, 2016)