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ORIGINAL ARTICLE

Eimeria tenella infection among broiler chicks *Gallus domesticus* in Riyadh city, Saudi Arabia

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Abstract *Eimeria* infection was surveyed among farm and house reared broiler chicks. For the first time, *Eimeria tenella* was recoded among chicken in Saudi Arabia. The prevalence of the infection was 80% among the house reared chicks while no infection was reported among the farm chicks. The younger chicks were more susceptible to the infection than the older ones.

1. Introduction

Poultry coccidiosis is one of the most economically devastating diseases affecting the intensive poultry industry worldwide (Williams, 1999; Shirley et al., 2004; Morris et al., 2007). It is caused by one or several of seven *Eimeria* species infecting chickens (McDougald, 2003). These species differ in their localization in the gut and in their ability to induce morbidity and mortality (Haug et al., 2007; Morris et al., 2007). Nine species of *Eimeria* were detected in surveys of commercial poultry farms in many countries (Morris et al., 2007). None of these species were reported in Saudi Arabia. However, Amoudi (1997) described two new other *Eimeria* species from local chicken in Saudi Arabia.

Due to the scarce of information on the chicken *Eimeria* species in Saudi Arabia; the present work was suggested. The present study surveyed the prevalence of *Eimeria tenella* in broiler chicks in Riyadh city, Saudi Arabia.

2. Materials and methods

The present study was conducted on 60 broiler chicks of different age collected from Riyadh city. Thirty of them were collected from six farms and the rest were collect from the animal market (house reared). According to Mattiello (1990) and Nematollahi et al. (2008) a simple of five chicks per 10,000 is sufficient to diagnose coccidiosis. The chicks were brought to the laboratory of parasitology in Zoology Department, College of Science in King Saud University for necropsy. Caeci were examined for gross pathological changes. Wet smears were prepared from caeacal scraping for microscopic examination of *E. tenella* oocysts.

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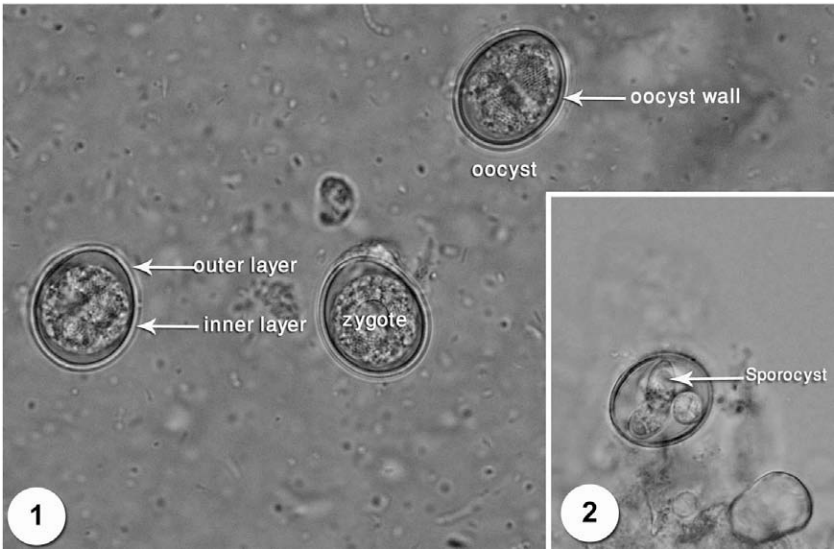

Figure 1 Oocysts of *Eimeria tenella* from broiler chick in Riyadh city, Saudi Arabia. 1. Unsporulated oocysts. 2. Sporulated oocyst. Scale-bar = 10 μm.

For sporulation, caeca feacal samples were kept in a Petri dish in 2.5% potassium dichromate at room temperature. The samples were examined microscopically after flotation, using Sheather's sugar solution. Observations focused largely on sporulated oocysts. Photomicrographs were obtained using a phase contrast microscope (Olympus). Thirty oocysts were measured and compared to those of *Eimeria* spp. previously reported in the world. All measurements and means are in μm, with the range given in parentheses followed by the shape index (length/width ratio).

3. Results

No infection was reported in chicks that were collected from farms. However, 80% (24/30) of chicks collected from animal markets (house reared) were found infected. As well as the younger chicks are more susceptible to the natural infection than the older ones. The infected caeci characterized by accumulation of clotted blood. The collected oocysts were oval in shape and the infection was restricted to the caeci. The unsporulated oocysts contained zygote filling the entire oocyst space (Fig. 1). While, the sporulated oocysts contained four sporocysts and each contained two sporozoites (Fig. 1(2)). The oocysts measurements were 21.6 ± 1.9 (18–24) μm in length and 19 ± 2.4 (17–20) μm in width. The oocysts sporulation time was 48 h.

4. Discussion

Coccidiosis is one of the most important and common diseases that affect poultry, it results in a great economic loss all over the world (Braunius, 1988; Magner, 1991). In the boiler chicks, nine *Eimeria* species were recognized *E. brunetti*, *E. maxima*, *E. necatrix*, and *E. tenella* were highly pathogenic, *E. acervulina*, *E. mitis*, and *E. mivati* were rather less pathogenic, and *E. praecox* and *E. hagani* were regarded as the least pathogenic (Thebo et al., 1998; Al-Natour and Suleiman, 2002). None of these species were reported among chicks in Saudi Arabia up till now. However, Amoudi (1997) described two new different species of *Eimeria* in local chickens from Saudi Arabia. Based on shape, measurements and site of infection of the recorded oocysts; it was typically *E. tenella*. Therefore, in this study we confirm the presences of *E. tenella* among the chicks in Saudi Arabia. The prevalence of infection was 80% among the house reared chicks and no infection was reported in farm reared chicks. The poor management practices in the house reared chicks might be a direct cause for such high prevalence (Nematollahi et al., 2008). The result of this study showed that the prevalence of the infection increased among the younger chicks. This result was in agreement with Stayer et al. (1995) and McDougald (2003). We recommended more survey for the *Eimeria* species as we expect many species to be described form Saudi Arabia chicks.

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