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Pathological and anatomical study of cecal coccidiosis in broiler chickens

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Abstract

The present study aimed to investigate the prevalence of *Emeria tanella* in broiler chicken in Al-Saniya city of Al-Diwaniyah governorate, 50 birds were taken from the broiler chicken, was transferred to the laboratory of parasites in the college of the science University of Al-Qadisiyah for the experimental infection parasitic and the observation of anatomical and histopathologicalogical changes on birds understudy, pathological study for broiler chicken were doing in the laboratory to investigate the histological changes caused by the parasite, while the anatomical study of the infected birds showed hypertrophy in two arteries with severe inflammation with congestion and swelling and congestion in blood, histopathological changes of ceca showed damage and necrosis in epithelial cell of ceca, and the fall of the epithelial layer cells within the cavity of the cecum with noting the presence of large numbers of different phases of the parasite.

Keyword: Coccidiosis, *Emeria tanella*, Broiler chicken.

Introduction

Coccidiosis is one of the most dangerous parasitic diseases that affect poultry, not only in Iraq, but also in the Arab world and the world at large, despite the scientific progress that has occurred in the field of prevention and treatment of diseases in general, but it remains the first parasitic enemy facing the poultry industry because of what it causes Health problems that lead to heavy economic losses represented in the loss of income and the cost of treatment, prevention and control of pollution as well as the high losses it causes among poultry flocks and lack of growth and this requires raising new flocks free of disease (Jadhav *et al.,* 2011, Al-abodi, 2019), this disease is characterized by its rapid occurrence and spread among chickens at any stage of its life throughout the year all over the world, and it is very difficult to keep poultry from infection (Faroaq, 1999), and it is an old enemy that still represents a great challenge to the poultry industry, as it is one of the most dangerous parasitic diseases. The most common and costly affliction of poultry despite the great progress in the field of prevention, treatment, management and genetics, but it remained the great challenge facing this industry causing economic losses amounting to more than one and a half billion dollars annually (Hausermann, 1999) due to its direct impact on the health and productivity of infected chickens and a decrease Growth rate, productivity and weakness in the food conversion factor at all ages (Morris *et al.,* 2004), this disease is caused by organisms of the parasitic protozoans belonging to the phylum Apicomplexa, the class of sporozoa, the genus Eimeria, which is more complex than bacteria and viruses and is obligate parasitism, as it is characterized by high specificity of the host and the member that parasitizes it in the host itself (Williams, 1998).

There are nine types of this parasite, and the type *E.tenella* is one of the most common and widespread types in the world. It infects the two eyes in chickens and is characterized by a very complex life cycle that develops inside and outside the host's body, and in which sexual and asexual reproduction occurs, and it is more and more virulent species and this severe virulence is attributed to The second generation of metastases evolved in the main plate of the eyelids, causing deep ulcers and necrosis in the epithelial layer (Williams, 1998). One of the most important features of this type in chickens is the decrease in the efficiency of food conversion, feed consumption and weights of affected birds (Saif *et al.,* 2003). The first pathological changes appear on the third day of injury in the form of hemorrhagic spots in the lining of the two cecum accompanied by severe bleeding inside the cavity, after which the severity of the injury increases as the contents of the two cecum are filled with clotted blood, and the cecum becomes pale, shrunken and has a thickened wall. Mortality may occur (Jordan *et al.,* 2002), causing a high mortality rate that may reach more than 20% (Mc Dougald et al., 1997).

Material and Methods

A total of 50 chicks were used in the research from local meat chicks at the age of one day, and these

chicks were bred until they reached the fourth week of life. All the requirements were prepared for this. The chicks were divided into two equal groups at the rate of 10 chicks per group. Each group was divided into five replications. At a rate of 10 chicks per replicator, the chicks were reared in places of equal size and exposed to the same conditions of feed, water and lighting. The first group was left without injury as a control group. As for the chicks of the second group, they were dosed with pre-prepared mature sacs for the purpose of inducing experimental infection with this parasite at the end of the third week of their life. They were dosed with a challenge dose of (5 x 104) a mature egg sac for *E.tenella* by injection. In the mouth of the bird using a sterile plastic syringe, according to (Allen et al., 1997), Then, the condition of the chicks for the two groups was monitored and followed up, any clinical signs of disease that might appear on them, and 5 chicks per week were chosen randomly, starting from the fourth week to the ninth week of their life, for their autopsy, recording any disease signs appearing on them, and taking histological sections for the purpose of conducting a macroscopic and microscopic examination.

Results and Discussion

When examining the histological sections of the cecum in microscopically infected birds, many pathological changes appeared, represented by the occurrence of significant and clear damage to the capillary vessels due to the presence of the first generation of mature metastases that caused this great damage to the capillary vessels and the emergence of hemorrhagic lesions as in Figure (1), as well as the occurrence of clear tissue changes such as the occurrence of hyperplasia of the goblet cells with the presence of severe necrosis, deformation, and laceration of the epithelial cells of the cecum and loss of their normal features. as in Fig. (2) and (3).

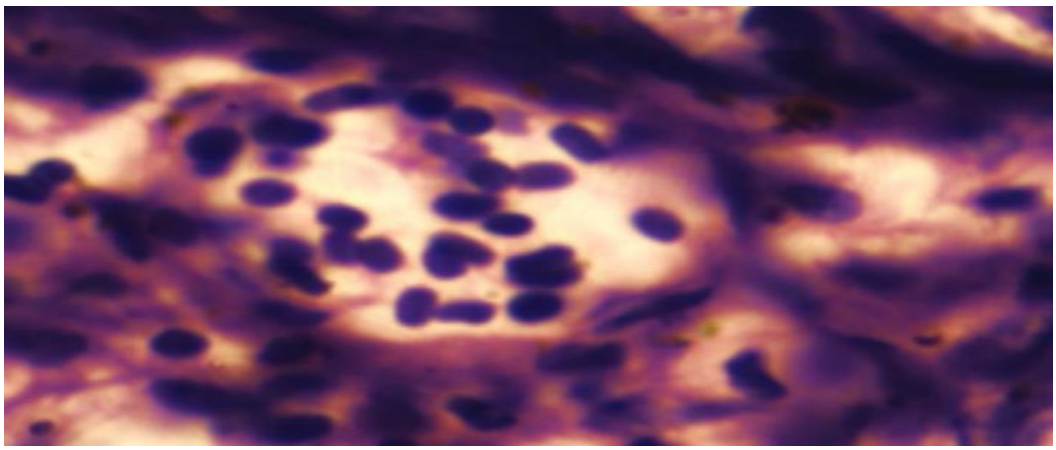

Figure 1: A histological section of the cecum of chicks of domestic chickens infected with *E.tenella* showing the presence of different parasite stages within the epithelial cells.

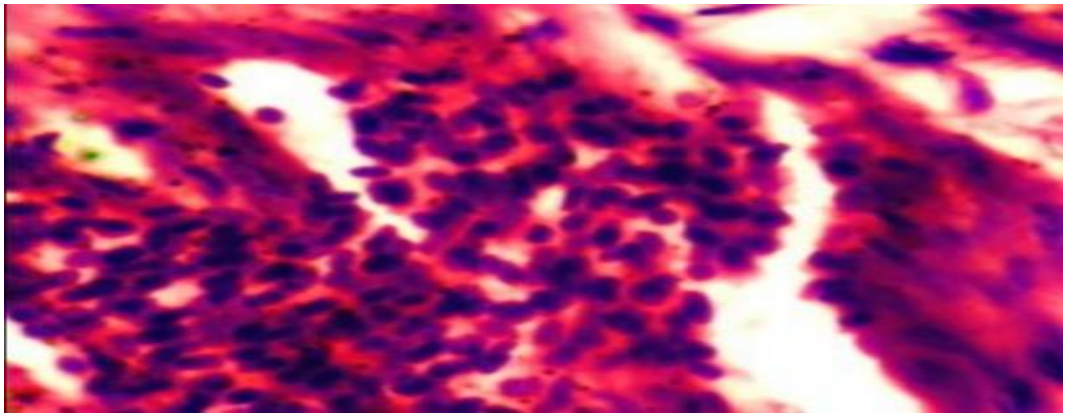

Figure (2): A histological section of the cecum of chicks of local chickens infected with *E.tenella* showing the presence of numbers of parasite stages within the epithelial cells that have been destroyed by infection with the presence and hemorrhage of congestion of capillaries.

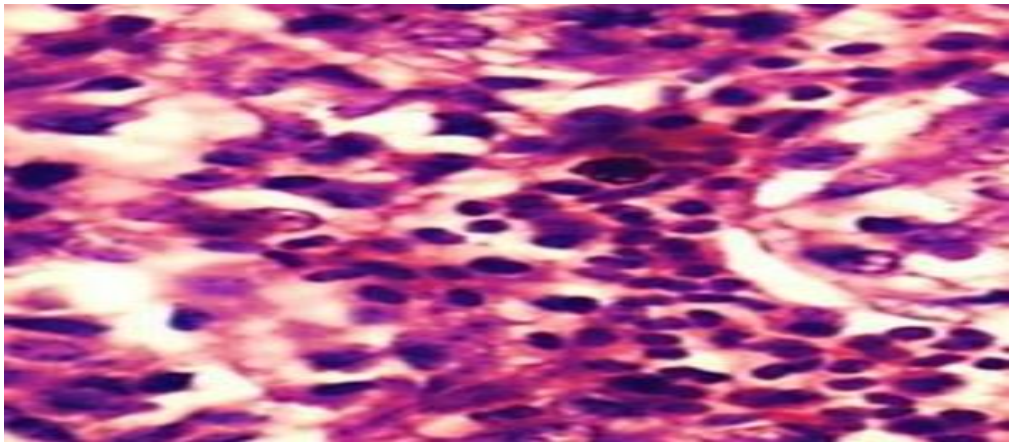

Figure (3): A histological section of the cecum of chicks of local chickens infected with *E.tenella*, showing the presence of goblet cell hyperplasia with necrosis due to the presence of numbers of parasite stages within the virulent epithelial cells.

The *E.tenella* parasite is one of the parasites that cause great economic losses to the poultry industry, causing a significant deterioration in the weight gain of the affected bird as well as the occurrence of high mortality rates. It may be shown through the current study that this parasite has the ability and clear and severe effect in causing many changes, symptoms and signs Severe illness on the affected birds was represented by weakness, extreme fatigue, emaciation, and general weakness with a clear decline in the general health of the bird, such as the loss of the ability to concentrate and move, as well as his abstention from eating feed and water, and this is consistent with what Al-Shaibani (2015) found, who attributed the aggravation of injury to that foreign meat chickens are few resistance and immunity therefore, the infection with this type of parasites caused him stress that was evident from the beginning, when performing the anatomy of the dead and injured birds, it was found that there are clear pathological lesions on the outer wall of the cecum such as severe congestion and this is completely identical to what was mentioned by Lillehoj (2004) and Al-Sheikhly (2003). Increased areas of hemorrhagic foci and ulcers within the ceca and this result was completely identical to what we found in our current study.

The great damage caused by this type of parasite may be due to the huge numbers of different reproductive stages of the parasite penetrating into the tissue of the ceca and causing them to tear, break and destroy the epithelial layer of the ceca, that the severity of the pathological lesion in the two ceca has increased significantly with the advancing age of the injury, and this is consistent with the money indicated McDougald (2003) who also noticed an increase in the size of the two ceca as the injury progressed as a result of their being filled with blood clotting segments, and this result was completely identical to what we found.

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