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**PATHOLOGICAL OBSERVATION ON HEPATIC
 COCCIDIOSIS IN RAT**
 (With 6 Figures)

By

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دراسة باثولوجية لكوكسديا الكبد في فئران التجارب البيضاء .

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تم فحص عدد ٢٠ من فئران التجارب البيضاء التى تعاني من الإسهال . وقد لوحظ أن التغيرات الباثولوجية تتركز فى الكبد والأمعاء الدقيقة . وكان تكاثر الخلايا البلائية المبطن للفتحات المرارية أهم التغيرات الموجودة فى الكبد . ولقد شوهد تكاثر الأطوار المختلفة للكوكسديا فى هذه الخلايا بالإضافة إلى خلايا الأمعاء الدقيقة . ولقد إستخلص من هذه الدراسة أن الإصابة بكوكسديا الكبد يمكن أن يحدث فى الفئران البيضاء وأن التغيرات الباثولوجية تتسابه مع متهلتها التى تحدث فى كبد الأرانب .

SUMMARY

20 Rats suffering from digestive disturbances were examined. Pathological changes were observed in the liver and intestine. Severe hyperplasia of the epithelium of the bile duct was prominent together with Eimeria infection in different stages of gametogenesis. The intestine revealed extensive desquamation of its mucosa as well as the presence of great number of Coccidial oocyst. It was concluded that, hepatic coccidiosis can occur in rats and the lesions were greatly similar to hepatic coccidiosis in rabbits.

INTRODUCTION

Many species of Eimeria infect laboratory animals. JOHN and JOSEPH (1983) stated that, Eimeria migairil, Eimeria separata and Eimeria carinii were always encountered in association with intestinal coccidiosis of Rats. The disease is manifested by diarrhea and occurs following unusual stress as shipment or heavy parasitic infestation (DAVIS *et al.*, 1953). However coccidiosis is a protozoal disease of rabbits and wild lagomorphs and is in fact the important protozoa malady of these animals. In the available literature there is no reports on such affection in rats. This work was designed to throw some light on hepatic coccidiosis in rats.

MATERIALS and METHODS

The materials of this work were obtained from a private laboratory animal farm at Elmansoura Governorate. After transportation 20 rats, showing symptom of diarrhea for 3 days and were died. Post mortem examination was performed. The pathological changes were found only in the liver and intestine. Samples were obtained from these two organs, fixed in 10% neutral buffer formalin and furtherly processed at the department of Vet. Pathology Assiut University by conventional methods for histopathological studies.

RESULTS

Gross findings :

The lesions were found in the liver and intestine. The first was enlarged and congested with the presence of greyish white foci. These foci were irregularly shaped, depressed under the surface and with fuzzy edges. Cut sections oozed yellowish green fluid. Sometimes the nodules resemble a cord like along the path of affected bile ducts. Examination of the intestine grossely revealed only edema, reddening and white streaking of the intestinal mucosa in some animals. On the other hand an obviously red intestinal tract filled with fluid was a common signs in the majority of cases. Moreover erosion together with sloughing of the mucosa were present in others.

Microscopic findings :

The pathological lesions of the liver were always present in the bile ducts. These become enormously enlarged by proliferation of the epithelium which thrown into papillary folds resembling adenomatous hyperplasia (Fig. 1) which usually contains coccidia in various stages of development (Fig. 2). Desquamation of the biliary epithelium which accumulated in the lumen of some bile ducts was also appeared (Fig. 3). Some of the coccidial oocyst were also mixed in the desquamated epithelium. Careful examination of the coccidial structures in the proliferating bile ducts showed either a large structure with oval or elongated merozite (schizont) (Fig. 4a) or round structure with nucleus and eosinophilic granules Macrogamets (Fig. 4b). The oocyst have a double wall, pear shaped with transparent or esinophilic internal structure. The small bile ducts revealed hypertrophy of their mucosa together with mild hyperplasia of the epithelium. In this cases minimal lymphoid and esinophil cells infiltration around the bile ducts were observed (Fig. 5). The blood vessels including portal, central veins and sinusoides were congested and contained great numbers of esinophil cells. Thrombosis of some portal blood vessels was seen. Abundant population of esinophil and lymphoid cells within the blood vessels were also observed (Fig. 6).

A constant finding associated with proliferating bile duct is atrophy and degenerative changes in the surrounding liver parenchymes.

Microscopic examination of the intestine showed that most of the mucosal and glandular epithelium were filled with the different stages of coccidia. These leading to necrotic and desquamative changes. Lymphoid, and esinophil cell reaction could be recognized together with these desquamated epithelium in the lumen of the intestine. In addition

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the villi were destroyed. The blood vessels in the lamina propria were dilated and congested.

DISCUSSION

In this study hepatic coccidiosis was diagnosed histopathologically in rats showing diarrhea. The pathological changes were observed mainly in the intrahepatic bile ducts and consisted of a prominent hyperplastic changes of their epithelium. The hyperplastic changes were so severe that a long branching papillary projections, papillary hyperplasia, were formed. *Eimeria* in different developmental stages was observed in the proliferating biliary epithelium. The above mentioned pathological alterations were described in hepatic coccidiosis of rabbit (HOENIG *et al.*, 1974; BARRIGA and ARNONI, 1979). JONES and HUNT (1983) stated that in hepatic coccidiosis of rabbit, the sporozites reach the intrahepatic bill duct through the portal veins or lymphatic aggregation. A similar mechanism was likely to be occurred in hepatic coccidiosis of rat. Thrombosis of the portal blood vessels as well as the presence of increased numbers of lymphoid and esinophil cells may support this opinion.

Desquamative enteritis was extensive and was responsible for diarrhea observed. This disease occurred following transportation and this will point to the importance of the predisposing causes for the appearance of hepatic coccidiosis in rat.

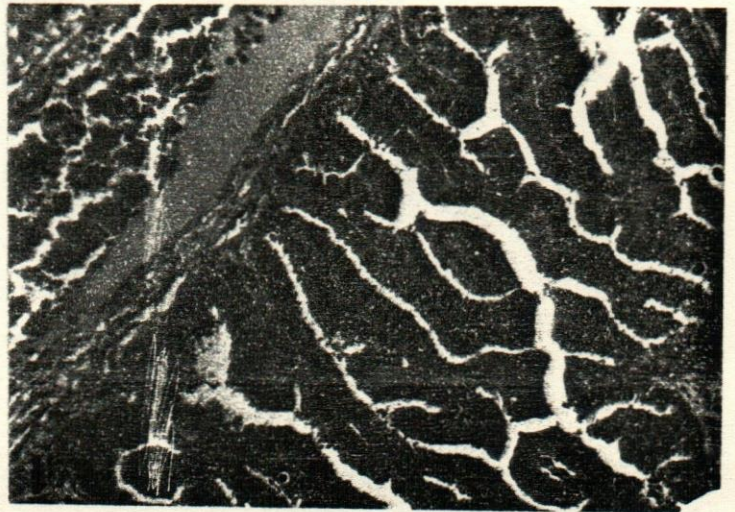
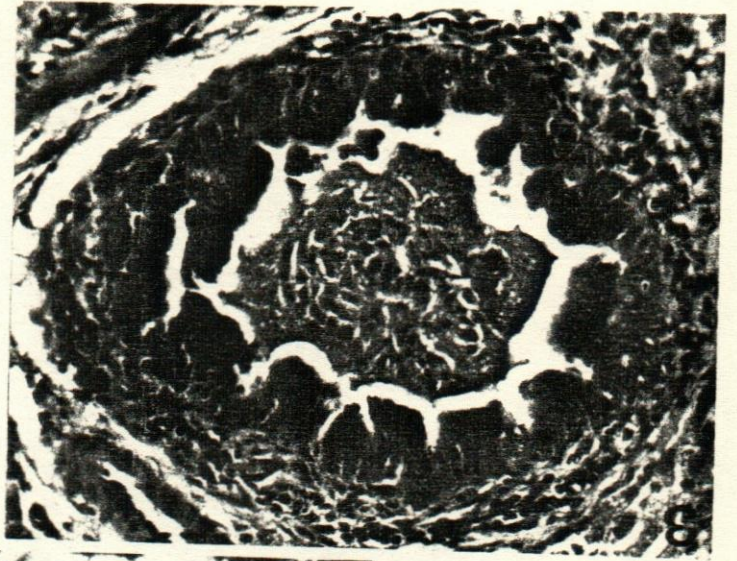
From this study, we can concluded that hepatic coccidiosis occurred in rats. The lesions and pathogenesis of the disease were similar to those observed in hepatic coccidiosis of rabbits. The intestine was involved and revealed the picture of intestinal coccidiosis of other animals. Predisposing factors were important in the pathogenesis of the disease and a wareness of preventive measure in experimental pathology would seem important.

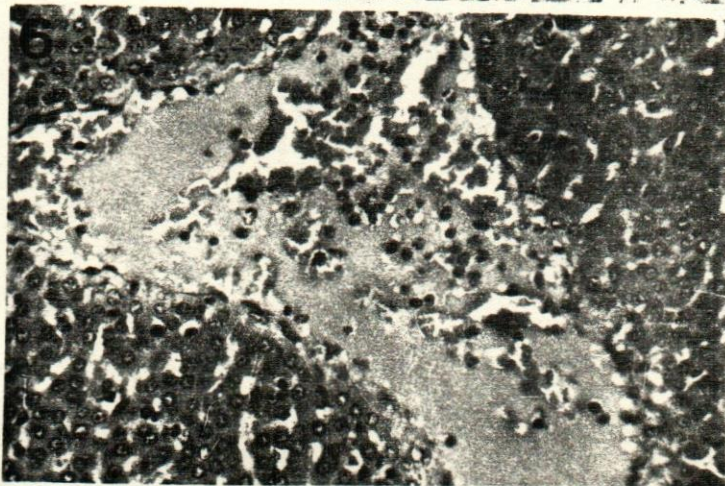
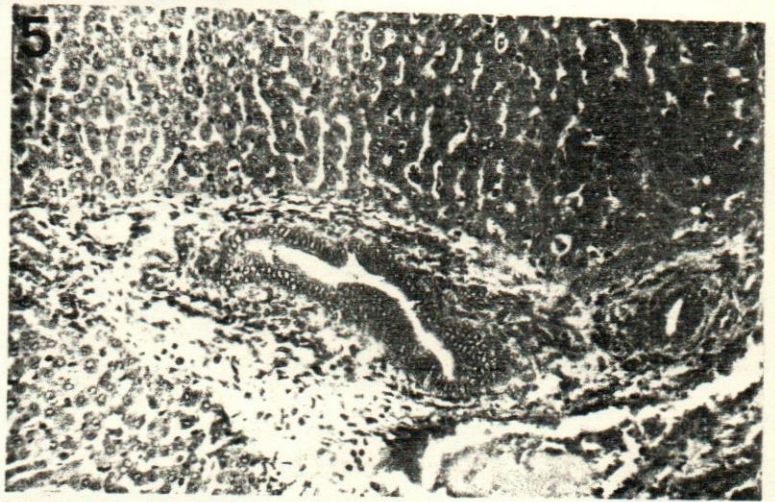
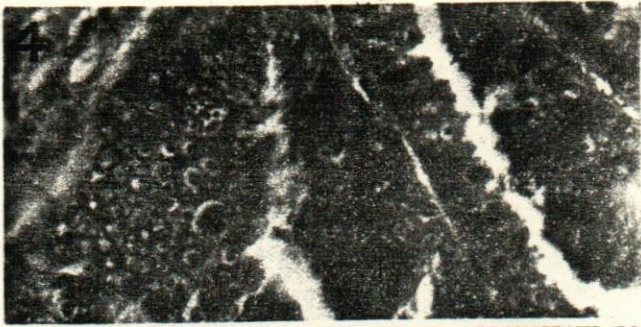
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DESCRIPTION OF FIGURES

- Fig. (1):** Showing adenomatous hyperplasia of the biliary epithelium (H&E. 10x10 X).
- Fig. (2):** Showing eimeria in various stages of development (H&E, 10x25 X).





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Fig. (3): Showing desquamation of the biliary epithelium (H&E, 10x25 X).

Fig.(4a&b): Showing some stages of sexual division of eimeria (H & E, 10x25 X).

Fig. (5): Showing pericholangitis with early evidence of epithelial hyperplasia. (H&E, 10x10 X).

Fig. (6): Showing thrombosed blood vessels with abundant amount of eosinophii cells (H&E, 10x16 X).