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EXPERIMENTAL INFECTION OF RABBITS WITH *Dictyocaulue filaria* - PATHOLOGICAL FINDINGS

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SUMMARY

This experiment was designed to evaluate rabbite as an experimental animal for *Dictyocaulue filaria* (of sheep erigin) infection, using parasitological and pathological parameters. Fifteen adult rabbits of local breed were divided into 3 equal groups and given orally 1000. 2500 and 5000 infective larvae per animal respectively. One animal from each group was sacrificed 6,10,15,21 and 30 days pest infection. Results showed that most rabbits of all groups resisted infection with *D. filaria* as evidenced from the clinical and pathelogical findings and the reduced numbers of the recovered parasites and their stunted growth. It is concluded that rabbite are not good laboratory animal model for reproduction of *D.filaria* infection.

INTRODUCTION

Small laboratory animals including guinea pigs, mice and rabbits could serve as experimental animals for the study of ovine and bovine lungworm infection (1,2,3,4). However, the results are contradicting. Soliman (1) and Tewari *et al* (4) found that when the infective larvae of *Dictyocaulus filaria* experimentally infect small laberatory animals, especially guinea pigs, they may reach the stage of sexual maturity and induce pneumonic lesion similar to that reported for the natural host. However, this findings was different from that of Wade *et al* (3) and Al-Dabagh and Ali (5), who stated that

rabbits when experimentally- infected with infective larvae of D. filaria, the infective larvae do not reach sexual maturity in their lungs. The above authors considered the guinea pigs as the most satisfactory host for the experimental infection with D. filaria.

The present communication is to evaluate the suitability of rabbits as an experimental laboratory animal for D. filaria infection of sheep.

MATERIALS AND METHODS

Larvae of D. filaria were obtained from experimentally-infected lambs. the larvae were cultured using the procedures described before (4,6). The third stage larvae were stored at 4-6 C° and within two weeks of their reaching the infective stage, they were given orally to (15) adult rabbits of local breed and of both sexes.

Rabbits were randomly divided into three equal groups and were given a dose level of 1000, 2500 and 5000 infective larvae per animal respectively.

One animal from each group was sacrificed 6, 10, 15, 21 and 30 days post infection and their lungs were examined for gross lesions. For histopathological study, small pieces of lung tissue were fixed in 10% neutral buffered formalin, processed routinely, cut at 5mm thickness and stained with hematoxylin and eosin (H&E).

RESULTS

The parasitological findings are reported elsewhere (5) but briefly, it was found that numbers of recovered worms from each inoculated animal were few, immature and indeed no worms could be recovered on days 21 and 30 post inoculation. The measurements (length and width) of the recovered parasites were quite small. The sexual differentiation did not occur until day 10 post inoculation. Furthermore, none of the animals developed

clinical sings of lungworm disease or passed larvae in its faeces.

Pathologically, the lungs of examined animals did not show superficial gross lesions. However, ecchymotic hemorrhages were seen on the diaphragmatic lobes of lungs of four rabbits given 2500 and 5000 infective larvae and on days 30 and 21 post infection respectively.

Histologically, the lungs of those rabbits with gress pulmonary lesions had edema, congestion and occasional hemorrhages and in two of them mild interstitial reaction is seen and characterized by increased thickness of alveolar septae caused by their infilration with mononuclear cells (macrophages and lymphocytes) and eosinophils (Fig.1). In one of the above 2 cases, a focal granulomatous lesion was seen and consisted of a central necrotic eosinophilic mass (fig.2) surrounded by epithelioid cells mixed with lymphocytes, eosinophils and giant cells. Further outside this inflammatory zone, there was a fibrous tissue capsule. Adjacent pulmonary tissue showed atelectasis.

DISCUSSION

The measurements (length and width) of the recovered parasites were quite low and were less than those reported for the same parasite in guinea pigs experimentally-infected through the same route (7). Pathologically, other than the ecchymotic hemorrhages seen on one lobe, there were no detectable gross pneumonic lesions. Such finding is not unusual, since it has been found (8) that in goats, only few mature lungworms were present in the lungs which were free from any gross lesion.

Histologically, the pulmonary congestion, edema and hemorrhage and occasional mild interstitial pneumonitis are also reported in experimental (guinea pigs) and natural (goats) infection with D. filaria (4,9). Furthermore, the chronic focal granulomatous pneumonia is

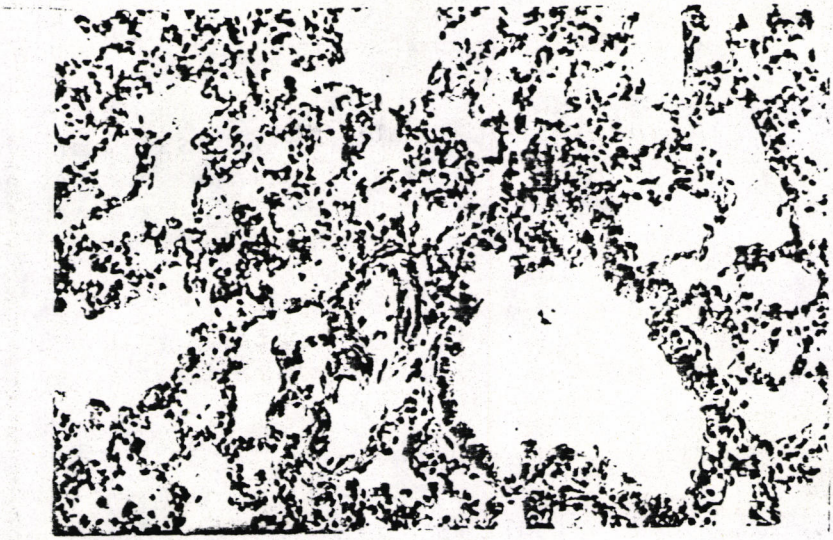

Fig. 1: Interstitial pneumonia. Notice thickening of alveolar walls due to its infiltration by mononuclear cells (macrophages and lymphocytes) and eosinophils. (H&E) X 250.

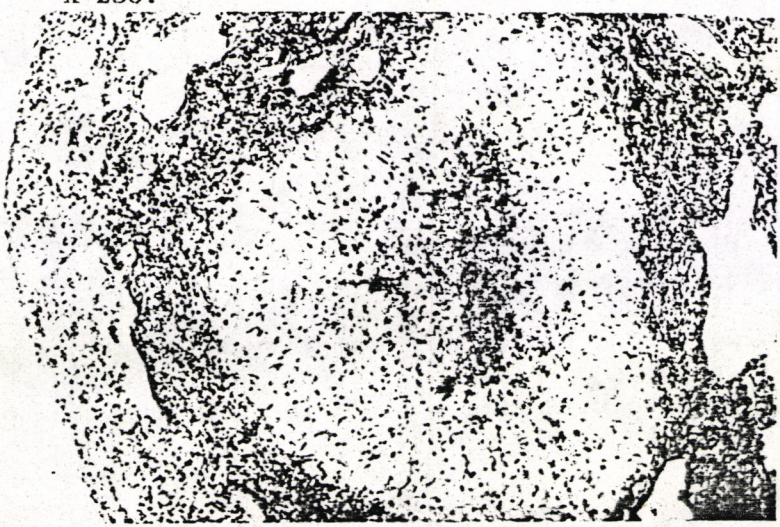

Fig. 2: Granulomatous pneumonia. Notice the central necrotic eosinophilic mass surrounded by epithelioid cells, mixed with giant cells, lymphocytes and eosinphils on the outside. (H&E) X 125.

reported in goats (8) and is explained as an indication of resistance of the animal to the lungworm infection.

In this study, the aborted infection as evidenced by the general absence of lung lesions, can be explained on the basis that few worms reached pulmonary tissue, and gradually became degenerate. From results of recovery of parasites, clinical and pathological findings of this study, it is concluded that rabbits are not good laboratory animal for reproduction of D. filaria infection at least when compared with other laboratory animals (guinea pigs) and definitely when their lesion is compared with the disease in its natural host.

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الخمج التجريبي بطفيلي Dictyocaulus filaria في الارانب - النتائج المرضية

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الخلاصة

صممت هذه التجربة لمعرفة مدى صلاحية استخدام الارانب كنموذج تجريبي لدراسة الخمج بطفيلي Dictyocaulus filaria وقد استعملت خمسة عشر ارنب محلي قسمت الى ثلاثة مجاميع متساوية واعطيت ارانب كل مجموعة عن طريق الفم (١٠٠٠، ٢٥٠٠، ٥٠٠٠) يرقة خمجية لكل حيوان على التوالي وذبح حيوان من كل مجموعة في الايام ٦، ١٠، ١٥، ٢١ و٣٠ بعد الخمج.

أوضحت النتائج مقاومة الارانب للخمج بـD. filaria من خلال النمو البطيء وقلة عدد الطفيليات المكتشفة ومن خلال العلامات السريرية والآفات المرضية وقد استنتج بأن الارنب حيوان غير جيد لدراسة الخمج التجريبي بالطفيلي.