SOME STUDIES ON FASCIOILA GIGANTICA AMONG NATURALLY INFECTED RABBITS IN BEHERA GOVERNORATE; EGYPT.

BY

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SUMMARY

Faecal samples from 478 Balady rabbits were examined for the presence of Fasciola gigantica eggs; to clarify its possible role in the epidemiology of this parasite. The seasonal dynamics of F. gigantica among naturally infected rabbits was stated; where the infestation role with this helminth parasite was found to be 16% in Autumn; 29.6% in Winter; 3.6% in Spring and only 2.8% during the Summer months. The detected eggs were viable and hatched after 7-9 days at 26°C. The hatched miracidia were active and remained alive for 9 hours. Moreover, the pathological changes in the livers of naturally infested rabbits with F. gigantica were also discussed.

INTRODUCTION

Fasciola gigantica is a natural parasite of herbivorous animals as cattle, sheep and goats as well as other wild ones (Soulsby, 1982). In Egypt, successful
experimental infections of rabbits with F. gigantica had been discussed by Yousef (1983) and Desoky (1985). Moreover, sporadic cases of natural infection has also reported by Ezzat and Abdel Ghani (1960) and Abdou (1961). So, the aim of the present study is to give a knowledge about natural fascioliasis among Balady rabbits in Behera Governorate, Egypt; its incidence, seasonal dynamics and pathogenesis in the liver of infested rabbits.

**MATERIAL AND METHODS**

478 faecal samples were collected from Balady rabbit in Behera Governorate, during the period extending from March (1985) till the end of February (1986). Each sample was put in separate plastic bags with the needed data (sex, age, date of collection, diet, environmental conditions and place).

In the laboratory, the faecal samples were examined by the direct and sedimentation techniques mentioned by Soulsby (1982); looking for the presence of F. gigantica eggs. In highly infested cases, some eggs were collected, washed and incubated in dechlorinated water at 26°C.; for detecting any signs of embryonation and miracidial formation.

Moreover, three infected rabbits were selected, slaughtered and its livers were individually examined for adult fasciola worms. The detected flukes were fixed, stained and prepared in permanent mounts according to Carleton (1957). For pathological examination; small parts of these livers were fixed in 10% formal saline, dehydrated & stained as mentioned by Bancroft (1977).
RESULTS

Table (1) displayed the results of faecal examinations of the samples collected from the 478 Balady rabbits. It was found that, the total infestation rate of rabbits with F.gigantica was 13.39%. High infestation rate (29.6%) was recorded in Winter and followed by Autumn (16%). However, in Spring and Summer the infestation rate was low; 3.6 and 2.8% respectively (Graph 1).

It was found that, the incubated eggs developed and the miracidia hatched after 7-9 days at 26°C. The hatched miracidia were very active and remained alive for 7-12 (mean 9) hours).

Examination of the infested livers showed adult F.gigantica worms. Two mature worms were recovered from the first liver, their measurements ranged from 3-3.5 long and 7mm in breadth. The second and third livers each contained 10 and 14 worms respectively. Their sizes ranged between 0.9-2.5cm and 2-6mm in length and breadth respectively. Microscopic examination of the mounted stained specimens showed that only three were mature F.gigantica worms showing reproductive organs and uteri full of eggs. The other worms were immature at various stages of development.

Histopathological examination of the infested livers showed numerous areas of fibrous tissue in the portal tracts. In advanced stages, the fibrous tissue had tremendously increased, causing pressure atrophy to the hepatic lobules. The fibrous tissue was infiltrated with macrophages and plasma cells. Sometimes, the macrophages were observed loaded with yellow to brown pigments. Moreover, the walls of the bile ducts and blood vessels were increased in thickness and their lumen were seen nearly obliterated in the advanced stages. The epithelial lining of the bile ducts showed hyperplasia. The flukes as well as their eggs were found in some of these ducts. Some areas showed severe damage in the hepatic cells which suffered from claudy swelling, hydropic degeneration and fatty changes. In this case, the hepatic tissue became infiltrated with inflammatory cells and replaced partially or completely with fibrous tissue infiltrated with inflammatory cells. (Fig.1&2).
DISCUSSION

In Egypt, Fasciola gigantica is still the more prevalent helminth parasite among farm animals. Azzat and Abdel Ghani (1960) as well as Abdou (1961), described for the first time F. gigantica from naturally infested rabbits. In the last few years, liver fascioliasis in human was recorded in different localities in Delt region (Farag et al., 1979). So, for the best of our knowledge, it is clear that study is considered as a first trial about the incidence of F. gigantica among naturally infested rabbits in Egypt, especially in Behera Governorate.

The present of mature worms in the livers of slaughtered rabbits as well as the development of activity alive miracidia from the incubated eggs collected from naturally infested rabbits; indicating that rabbits could act as reservoir hosts for Fasciola gigantica. This observation was also reported by Ezzat and Abdel Ghani (1960).

The shape of the adult worms, their small size and low number recovered from infested rabbits might be related from the authors opinions to the small capacity of rabbits livers. This finding was in agreement with that of Desoky (1986) in his experimental work on F. gigantica in rabbits.

Concerning the seasonal dynamics of F. gigantica among naturally infested rabbits; the present study showed that the high incidence of infection was observed in Winter and Autumn months. Similar results were also observed among Ruminant animals. This might be attributed to the methods of feeding and the environmental conditions particularly the rainfall seasons (Ross, 1970; Olletenshaw, 1971; Coghill, 1974; Al Barwari, 1978 and Hiekal, 1984).

Regarding the pathogological changes in the livers of rabbits, naturally infested with F. gigantica; it was observed that numerous areas of fibrous tissue were seen in the portal tracts which were infiltrated with macrophages and plasma cells. Also, the epithelial lining
of the bile ducts showed hyperplasia and the hepatic cells were suffering from claudy swelling hydropic degeneration or fatty changes. There results came in agreement with that of Urquhart (1956), during his experimental study of rabbit fascioliasis. Moreover, the same changes were discussed in the liver of ruminant animals due to natural infection with F. gigantica (Sengupta, and Iyer, 1968; Arora and Iyer, 1974; Joh et al., 1976 and Hiekal, 1984).

Lastly, the authors worth to throw the light on two main important points. The first which is imprtant during the control program of F. gigantica among farm animals as well as man; that rabbits should be taken in consideration as reservoir hosts for this parasite. The second is that human must take care when eating rabbit livers to avoid the possibility of infection with Halazon disease.

REFERENCES


Churchill livingstone, Edinberg, London, N.Y.

Carleton; E.M. (1957): Histological techniques for normal and pathological tissues and the identification for parasites.
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Table 1: Incidence of Fasciola gigantica Infestation among Rabbits in Beh. Gov.

<table>
<thead>
<tr>
<th>Months</th>
<th>No. of examined</th>
<th>No. +ve</th>
<th>Seasonal %</th>
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<tbody>
<tr>
<td>March</td>
<td>49</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>April</td>
<td>56</td>
<td>1</td>
<td>3.6 Spring</td>
</tr>
<tr>
<td>May</td>
<td>31</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>45</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>July</td>
<td>30</td>
<td>-</td>
<td>2.8 Summer</td>
</tr>
<tr>
<td>August</td>
<td>32</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>September</td>
<td>35</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td>34</td>
<td>5</td>
<td>16 Autumn</td>
</tr>
<tr>
<td>November</td>
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<td></td>
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<tr>
<td>December</td>
<td>40</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>45</td>
<td>19</td>
<td>29.6 Winter</td>
</tr>
<tr>
<td>February</td>
<td>50</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>478</td>
<td>64</td>
<td>13.39%</td>
</tr>
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Graph (I): Seasonal dynamics of F. gigantica among naturally infected rabbits in Behera Governorate, Egypt.
Fig(1): Infected liver tissue showing increased amount of connective tissue (t), the bile ducts were increased in thickness (b) and showed hyperplasia in its epithelia. H&E stain; Objec;

Fig.(II): Infected liver tissue in advanced stage. The hepatic lobules were replaced completely by connective tissue. Eggs of F.gigantica (e). H&E stain; Obj., 10. Ocular;6.