Pathological studies on some parasitic infestation in rabbits

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SUMMARY

The present study was done on 215 Rabbits (85 diseased and 130 recently dead). The rabbits were collected from different localities to study some parasitic infestation and pathological alteration.

Incidence of some parasites among examined rabbits were 13.95%, 12.55%, 20.93%, 6.51% and 9.30% in body mange, ear mange, intestinal coccidiosis, hepatic coccidiosis and C. pisiformis, respectively.

The clinical signs revealed loss of appetite, emaciation crusts on the skin, loss of fur, bloody diarrhoea, distention of abdomen and finally death.

The postmortem examination revealed alopecia, crusts on the skin, intestinal contents were mixed with blood and mucous, enlarged firm liver with yellowish white nodules and enlarged gallbladder with ascites were seen in hepatic coccidiosis. In C. pisiformis showed mature viable and dead cysts on peritoneum.

Histopathological examination revealed the mites in the epidermal tunnels, hemorrhages, cystic dilatation of hair follicles. ulceration of the epidermis, keratinization on the surface of the skin, leukocytic infiltration mainly eosinophils, lymphocytes and macrophages. Dermatitis hyperkeratosis of the hair follicles, acanthosis and calcification of the epidermis were seen in body mange. Dermatitis with necrotic hair follicles in ear mange. Intestinal coccidiosis showed varying degrees of developmental stages of Eimeria species in the intestinal lumen and epithelium. Moreover, hepatic coccidiosis showed, the hepatic parenchyma was replaced by fibrous tissue proliferation with leukocytic infiltration, greatly enlarged bile ducts with hyperplasia of their epithelium forming finger like projection and contents of oocysts. C. pisiformis showed migratory tract in which large area of coagulative necrosis surrounded by leukocytic aggregation in the liver.

It could be concluded that the parasitic infestations in rabbits cause considerable economic losses and cause severe pathological alterations. So the prevention and control must be done by good hygienic measure, balanced ration and use of prophylactic doses of anticoccidial and anthelmentic drugs.
INTRODUCTION

Rabbits are considered a good source of animal protein. They have recently received increased interest and intensive breeding in the commercial production programs to full the gab in animal protein. Rabbit meat has low fat, good flavour and easily digested, so it is good food for sick persons. Other uses including wool (Fur) production. Meanwhile, their used as good laboratory animals for solving human and animal problems (William et al., 1964; Steven, 1974; Cooper, 1976; Sandford and Woodgate, 1979 and El-Sheshtawy, 2003).

Rabbit industry is affected by many problems that cause severe economic losses mainly parasitic infestation as mange (Ear and Body), coccidiosis (Hepatic and intestinal), and tape worm (Taenia pisiformis), which are responsible for high mortalities and great losses in body weight (Flynn, 1973; Kraus, 1974; Fahmy et al., 1985; Atallah et al., 1986; Rashed, 1993; Mainning et al., 1994; Lebdah et al., 1995; Moharram, 1996; Badawy, et al.;1999 and Fathy, 2004).

The present work was done to record the incidence of some parasitic infestation in rabbits at Sharkia Governorate and study the pathological changes associated with these affection.

MATERIAL AND METHODS

Samples:
A total of 215 rabbits (85 diseased and 130 recently dead rabbits) aged from 1-4 months of various breeds and sexes were collected from different private farms in Sharkia governorate.

The rabbits were subjected to clinical, postmortem, parasitological and histopathological examination. The obtained results were recorded.

Parasitological examination :-
Skin scraping of the affected bodies and ears were subjected to direct microscopical examination after treatment with heated sodium hydroxide (10 % solution) according to Soulsby (1982), and Walker (1994). Egg and adults were identified according to Soulsby (1986) and Mullen and Durden (2002).

Intestinal smears were taken from intestinal contents and mucosa for detection of different coccidian stages. Also from peritoneum and mesentery for detection of Cysticercus pisiformis according to Soulsby (1982) and Georgi and Georgi (1990).

Hepatic smears were taken on glass slides from hepatic lesions or gallbladder and subjected to microscopical examination for detection of coccidian oocysts. Eimeria species were identified according to Soulsby (1982), Georgi and
Histopathological examination:
- Specimens of the affected skin, ear, liver and intestine were collected and fixed in 10% neutral buffered formalin, sections of 5 microns thickness were prepared and stained with haematoxylin and eosin according to Bancroft et al (1990) and then examined microscopically.

RESULTS
The parasitological studies:
- In this study Sarcoptic scabiei (S. scabiei) was identified from body and Psoroptes cuniculi (P. cuniculi) from ear mange. In intestinal coccidiosis many species of Eimeria oocysts were recorded in this study including E. intestinals, magna, media, perforans and piriformis. Moreover E. stiedae was recorded in hepatic coccidiosis. Cysticercus pisiformis (C. pisiformis) was detected on peritoneum and mesentery as encapsulated and aggregated like buches of grapes.
- The incidence of some parasitic infestation at Sharkia governorate were recorded in table (I).

The pathological studies:
- The clinical signs revealed loss of appetite, emaciation, crusts on the skin, scratching of the skin, shaking of the head, loss of fur and finally death commonly in body and ear mange, Moreover bloody diarrhoea, distention of the abdomen and then death in coccidiosis and enlarged abdomen in C. pisiformis.
- The postmortem examination revealed alopecia, thickening of skin with crusts on the surface in body and ear mange. The intestinal contents were mixed with blood and mucous while their wall was swollen, congested and haemorrhagic. Hepatic coccidiosis revealed enlarged firm liver with yellowish white nodules of irregular size and shape on hepatic surface also enlarged gallbladder (Fig., 1). Ascitis was observed. The cysticercus appear in form of grapes on the abdominal viscera. Also the viscera contained mature viable and dead cysts of C. pisiformis (Fig., 2).

The histopathological examination:
- In the body mange: the skin (S. scabiei) revealed that the mites is in the epidermal tunnels (Fig., 3). The mites in the epidermal tunnels with cystic dilatation of hair follicles (Fig., 4). Ulceration of the epidermis with mites in the epidermal tunnels and keratinized layer on the surface of the skin were detected (Figs., 5 and 6). The mites is seen between keratinized layer and epidermis with leukocytic infiltration mainly eosinophils, lymphocytes and macro-
phages (Fig., 7). Acanthosis represented by proliferation of the epidermal epithelium which extended to the dermal layer were evident (Fig., 8). Dermatitis with necrotic hair follicles were seen (Fig., 9).

- **In the ear mange:** The pinna (*P. cuniculi*) revealed the mites in the epidermal tunnels with calcification (Fig., 10). Moreover, hyperkeratosis of the hair follicles were seen (Fig., 11).

- **In the intestinal coccidiosis** varying degree of developmental stages of *Eimeria* species were seen in the intestinal lumen and epithelium (Fig., 12).

- **In the hepatic coccidiosis** revealed that the hepatic parenchyma was replaced by fibrous tissue proliferation with leukocytic infiltration mainly eosinophils, lymphocytes and macrophages (Fig., 13). Greatly enlarged bile ducts with necrotic debris containing oocysts in the epithelium was seen (Fig., 14). Severely enlarged bile ducts with thickening of their walls and hyperplasia of their epithelium forming finger like projection and oocysts in the epithelial cells were detected (Fig., 15).

- **In Cysticercus pisiformis** revealed that the hepatic parenchyma was replaced by migratory tract represented by large area of coagulative necrosis surrounded by leukocytic aggregation mainly eosinophils lymphocytes and macrophages (Fig., 16). Peritoneum showed mature *C. pisiformis* represented by bladder containing transparent fluid with single invaginat ed scolex surrounded by fibrous tissue capsule (Fig., 17).

**DISCUSSION**

In the present study the incidence of some parasitic infestation in rabbits at Sharkia governorate were 13.95% , 12.55% , 20.93% , 6.51% , and 9.30% in body mange, ear mange, Intestinal coccidiosis, hepatic coccidiosis and *C. pisiformis*, respectively. The above mentioned results are in agreement with Rashed (1993), Lebdah *et al.* (1995), El-Sheshtawy (2003) and Fathy (2004) who reported similar findings in the rabbits infested with the same parasites.

The observed clinical signs in this study were loss of appetite, emaciation, crusts on the skin, scratching of the skin, shaking of the head, loss of fur and finally death in body and ear mange. Moreover, bloody diarrhoea, distention of abdomen and death in coccidiosis, enlarged abdomen in *C. pisiformis* were observed. The aforementioned results were in agreement with those reported by Fahmy *et al.* (1985), Rashed (1993), Lebdah *et al.* (1995), El-Sheshtawy (2003) and Fathy (2004) who recorded the same results in rabbits infested with some parasites.
In this study the nervous signs were observed on rabbits infested with ear mange could be attributed to either secondary bacterial infection or extension of the inflammatory reaction to the inner ear or to the brain.

The postmortem lesions in this study revealed alopecia, thickening the skin, crusts on the skin surface in body and ear mange. The intestinal contents were mixed with blood, mucous on the congested intestinal wall. Hepatic coccidiosis revealed enlarged firm liver with yellowish, white nodules on hepatic surface beside severe enlarged gallbladder. Ascitis was also observed and the viscera contain mature viable and dead oocysts forming like bunches of grapes on the peritoneum and mesentery in C. pisiformis.

These results are similar to those recorded by Fahmy et al. (1985), Rashed (1993) , Lebdah et al. (1995), El-Sheshtawy (2003) and Fathy (2004) who reported the same results in rabbits infested with these parasites.

The histopathological examination: The skin in rabbits infested with body mange showed that the mites in the epidermal tunnels, cystic dilatation of hair follicles, ulceration of the epidermis, keratinization on the surface of the skin, acanthosis, leukocytic infiltration in the epidermis and dermatitis with necrotic hair follicles were seen. The above mentioned results are in partial agreement with those reported by Kraus (1974), Soulsby (1982), Fahmy et al. (1985), Rashed (1993), Manning et al. (1994) and Moharram (1996), who recorded that mites in the epidermal tunnels, keratosis, haemorrhages and leukocytic infiltration were seen.

The presence of large number of eosinophils in body mange may be attributed to cytotoxic function of these cells to parasites produce type of protein which is toxic for the parasites (Jones et al., 1997).

In the present study ear mange revealed epidermal tunnels contain mites with calcification and hyperkeratosis of the hair follicles.

The aforementioned results are in agreement with Flynn (1973), Kraus (1974), Rashed (1993) and Fathy (2004) who reported the same results.

In the intestinal coccidiosis in this work showed varying degrees of developmental stages of Eimeria species in the intestinal and lumen. The above mentioned results were in agreement with those reported by Fahmy et al. (1985), Rashed (1993), Lebdah et al. (1995) and Fathy (2004) who reported similar
findings in rabbits infested with the same parasites.

**In the hepatic coccidiosis** in the present work showed the hepatic parenchyma was replaced by fibrous tissue proliferation with leukocytic infiltration. Greatly enlarged bile ducts with necrotic debris containing oocysts in the epithelium. Moreover hyperplastic epithelium of the bile duct forming finger like projection were seen.

In *C. pisiformis* showed migratory tract in the hepatic parenchyma characterized by large area of coagulative necrosis surrounded by leukocytic aggregation and the peritoneum showed the vesicles. Each contained cystic fluid had single scolex surrounded by fibrous tissue capsule.

The abovementioned results are in agreement with those reported by Fahmy et al. (1985), Atallah et al. (1986), Rashed (1993), Lebd-ah et al. (1995), Badawy et al. (1999) and Fathy (2004) who reported the same results in rabbits infested with hepatic coccidiosis and *C. pisiformis*.

In this study, the ascitis which was observed in rabbits infested with hepatic coccidiosis could be attributed to severe damage of the hepatic tissue which interfered with the portal circulation and decreased osmotic pressure, beside toxic jaundice which occurred, may be due to extensive damage of the hepatic parenchyma.

**It could be concluded** that the parasitic infestation in rabbits cause severe economic losses so the prevention and control must be done by good hygienic measure, balanced ration and the use of prophylactic doses of anticoccidial and anthelmentic drugs.

Table (1): The Incidence of some parasitic infestation in Rabbits at (Diseased and recently dead).

<table>
<thead>
<tr>
<th>Rabbits</th>
<th>Total No. of examined rabbits</th>
<th>Mange</th>
<th>Coccidiosis</th>
<th>Cysticercosis</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Body mange</td>
<td>Ear mange</td>
<td>Intestinal co.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Diseased</td>
<td>85</td>
<td>12</td>
<td>14.11</td>
<td>15</td>
</tr>
<tr>
<td>Freshly dead</td>
<td>130</td>
<td>18</td>
<td>13.84</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>215</td>
<td>30</td>
<td>13.95</td>
<td>27</td>
</tr>
</tbody>
</table>
Figures
Fig: (1) Liver (Heptic coccidiosis) showing numerous yellowish white nodules (1-2 m.m. in diameter ) with enlarged gallbladder .
Fig. (2): Peritoneum showing mature viable and dead cysts of *C. pisiformis* .
Fig (3) Skin (*S. scabiei*) showing the mites in the epidermal tunnel (H&E X 150).
Fig (4): Skin (*S. scabiei*) showing the mites in the epidermal tunnel with cystic dilatation of hair follicles. (H&E X 300).
Fig (5): Skin (*S. scabiei*) showing keratinized layer on the surface of the skin with mites in the epidermal tunnel. (H&E, X150).
Fig (6): Skin (*S. scabiei*) showing ulceration of the epidermis with mites in their tunnel. (H&E, X150)
Fig (7): Skin (*S. scabiei*) showing the mites between keratinized layer and epidermis with leukocytic infiltration. (H&E, X200).
Fig (8): Skin (*S. scabiei*) showing acanthosis represented by proliferation of the epidermal epithelium which extend to the dermal layer (H&E, X 150).
Fig (9): Skin (*S. scabiei*) showing dermatitis with necrotic hair follicles. (H&E, X300).
Fig (10): Pinna (*P. cuniculi*) showing the mites in the epidermal tunnel with calcification (H&E, X200).
Fig (11): Pinna (*P. cuniculi*) showing hyperkeratosis of hair follicles. (H&E, X 300).
Fig (12): Intestine (intestinal coccidiosis). Showing varying developmental stages of *Eimeria* species in the intestinal epithelium. (H&E, X300).
Fig (13): Liver (Hepatic coccidiosis). Showing the hepatic parenchyma replaced by fibrous tissue proliferation with leukocytic infiltration. (H&E, X 300).
Fig (14): Liver (Hepatic coccidiosis) showing greatly enlarged bile duct with necrotic debris containing oocysts in the epithelium. (H&E, X300).
Fig (15): High power of the previous figure showing severs enlarged bile duct with thickening wall and hyperplastic epithelium of bile duct forming finger like projection and containing oocysts. (H&E, X600).
Fig (16): Liver (*C. pisiformis*) showing migratory tract represented by large area of coagulative necrosis surrounded by leukocytic aggregation mainly eosinophils, lymphocytes and macrophage. (H&E, X300).
Fig (17): Peritoneum showing mature *C.pisiformis* represented by cyst. surrounded by fibrous tissue capsule. (H&E, X300).
REFERENCES


Mullen, G. and Durden, L. (2002): "Medical and Veter-
inary Entomology" Academic press, USA.


