Clinical, Parasitic, and Histopathological Study of Pigeons Infested with Raillietina spp in Al-Qadisiyah Province, Iraq

Abbas Hadi Jasim Al-Mahmoud1*, Khalil G Chelab Al-Naile1, Mansour Jadaan Ali2, Monyer Abdulameir Abd Alfatlawi2, Tahseen A AL-Saeedi3

1Department of Pathology and Poultry Diseases, College of Veterinary Medicine, University of Al-Qadisiyah, Diwaniyah, Iraq
2Department of Microbiology, College of Veterinary Medicine, University of Al-Qadisiyah, Al-Diwaniyah, Iraq
3College of Agriculture, University of Al-Qadisiyah, Al-Diwaniyah, Iraq

Received: 3rd Feb, 19; Revised: 23rd May, 19, Accepted: 1st Jun, 19; Available Online: 25th Jun, 2019

ABSTRACT
Pigeons, in Al-Qadisiyah Province-Iraq, were investigated Clinically, parasitically, and histopathologically for the presence of Raillietina spp in their intestines. For these reasons, 5 cities from the mentioned province above were sampled as 150 (100 males and 50 females) pigeons were studied. The general clinical inspection, intestinal exploration and slides for the worms, and histopathological slide sections for the infested intestines were performed. The results of the clinical studies revealed delay growth in the young birds and emaciation in the adult pigeons. For the parasitic characteristics in the intestines, the results showed clearly the presence of Raillietina spp, declaring by their firmly attachment to the mucosa by their suckers and showing their segments, in the lumens of the small intestines. In the case of histopathological pictures, intestines revealed grossly small-intestine-wall-based enlargement and obstruction via intussception caused by the tapeworm presence with huge amounts of mucus and air bubbles and the parasitic white convoluted tracks in the intestinal mucosa. Microscopically, the results recognized that mucosa had mechanical disintegration, marked sloughing of the epithelial layers that belonged to the villi and crypts, epithelial-cell-based desquamation of the villi that were affected by dwarfism, mucosa and submucosa infiltration with mononuclear cells. This study provides important clinical, parasitic, and histopathological data of pigeons infested with Raillietina spp in Al-Qadisiyah Province, Iraq.

Keywords: Histopathology, pigeons, Raillietina spp.

INTRODUCTION
The tapeworm, Raillietina spp, affects vary numbers of birds such as chickens. The tapeworm is considered as a very pathogenic parasite, and the disease caused by this worm is called nodular tapeworm disease1. The disease replaces the healthy situation of a bird with weakness, emaciation, retardation of growth, and obstructions in the affected intestines2. The tapeworm belongs to the genus of Raillietina that contains 4 subgenera of Raillietina, Paroniella, Skrjabinia, and Fuhrmann3. For morphological features, tapeworms are characterized using scolex-based sizes and shapes, single or double rows of hooks in the rostellum, and armed or unarmed suckers, genital-based pores/segment different in numbers, egg capsule with varying numbers of eggs in a gravid proglottid4-5. The lifecycle of this tapeworm is maintained by 2 host which are ants and birds, and birds affected by this tapeworm are from wild or domestic lives1-6. The main affected sites by the worm are the small intestines, and the disease caused by these parasites in chickens, in heavy infestation, is noticed with clear intestinal nodules and granuloma-based enteritis in these sites7-8. Treatment of the disease can be done using certain anthelmintic medicines such as albendazole9-11. Praziquantel was also found to be effective against Raillietina echinobothrida employing the oxidative-based stress in the cells of the parasite12. Pigeons, in Al-Qadisiyah Province-Iraq, were investigated Clinically, parasitically, and histopathologically for the presence of Raillietina spp in their intestines. For these reasons, 5 cities (Diwaniyah, Hamza, Dagharah, Ghamas, and Al-Shamiyah) from the mentioned province above were sampled as 150 (100 males at ages of 1 month and 50 females at ages of 6 months) pigeons were studied. After sacrificing the birds, intestines were inspected directly by incising them longitudinally. The histopathological sections were made using 1-2 cm of the affected parts of the intestines and fixed with 10% formalin solution. The processes of histological preparation were performed according to13-14.
The worms were examined for the key features present in 15-17. 

RESULTS
The results of the clinical studies revealed delay growth

Table 1: The infection rates of females and males.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Infected</th>
<th>Percentage (%)</th>
<th>Non-infected</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>120</td>
<td>80</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Female</td>
<td>50</td>
<td>33</td>
<td>100</td>
<td>67</td>
</tr>
</tbody>
</table>

Table 2: The infection rates according to the age of the infected birds.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Older than 2 years of old</th>
<th>Percentage (%)</th>
<th>Younger than 2 years of old</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>100</td>
<td>83</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>Female</td>
<td>35</td>
<td>70</td>
<td>15</td>
<td>30</td>
</tr>
</tbody>
</table>

in the young birds and emaciation in the adult pigeons. Tables 1 and 2 show some statistics related to the infection by this worm.

For the parasitic characteristics in the intestines, the results showed clearly the presence of *Raillietina* spp., declaring by their firmly attachment to the mucosa by their suckers and showing their segments, in the lumens of the small intestines. In the case of histopathological pictures, intestines revealed grossly small-intestine-wall-based enlargement and obstruction via intussception caused by the tapeworm presence with huge amounts of mucus and air bubbles and the parasitic white convoluted tracks in the intestinal mucosa, figure 1 and 2.

Microscopically, the results recognized that mucosa had mechanical disintegration, marked sloughing of the epithelial layers that belonged to the villi and crypts.

Figure 1: Intestine exploration for the presence of *Raillietina* spp. A. The presence of *R.* spp, declaring by their firmly attachment to the mucosa by their suckers and showing their segments, in the lumens of the small intestine. B. The parasitic white convoluted tracks in the intestinal mucosa.

Figure 2: *Raillietina* spp slide section. C and D show the gravid proglottide, which appears in widget more than length, with one marginal genital pore. In general worm like rubber bands, whose length and width can stretch and shrink (A and B).

The worms were examined for the key features present in 15-17.
affected by dwarfism, mucosa and submucosa infiltration with mononuclear cells, figure 3.

DISCUSSION
The tapeworm, *Raillietina* spp., affects vary numbers of birds such as chickens. The tapeworm is considered as a very pathogenic parasite, and the disease caused by this worm is called nodular tapeworm disease. The disease replaces the healthy situation of a bird with weakness, emaciation, retardation of growth, and obstructions in the affected intestines. The tapeworm belongs to the genus of *Raillietina* that contains 4 subgenera of *Raillietina*, *Paroniella*, *Skrabinia*, and *Fuhrmann*. For morphological features, tapeworms are characterized using scolex-based sizes and shapes, single or double rows of hooks in the rostellum, and armed or unarmed suckers, genital-based pores/segment different in numbers, egg capsule with vary numbers of eggs in a gravid proglottid. The results revealed the presence of this tapeworm in the intestines of the tested pigeons. These results agree with who found 6 rock pigeons were infested out of 35 pigeons. In a study, feral pigeons (*Columba livia*) were found to be infected with this tapeworm at 84 (61.76%) out of 136 adult pigeons from Greece. From Iran, a study revealed that (28.26%) out of 46 domestic pigeons were infected with *R. echinobothrida*. The reason of the common infection with this type of worms might belong to the high presence of ants close to the infected pigeons. A study used 240 *Columba livia domestica* pigeons to check for the presence of different species of worms and found that 26 (10.6%) were infected with the current study investigated worm. The results of histopathological examination showed some changes in the affected tissues in the intestines, and these findings agree with who found similar to the current study results such as the increase in numbers of goblet cells. This study provides important clinical, parasitic, and histopathological data of pigeons infested with *Raillietina* spp. in Al-Qadisiyah Province, Iraq.

REFERENCES