A Study on the Gastro Intestinal Parasites of Domestic Pigeons in YSR Kadapa District in Andhra Pradesh, India

Abstract

A study was conducted to record the prevalence of gastrointestinal parasitic infections in domestic pigeons (Columba livia) in Y S R Kadapa district of Andhra Pradesh in India. A total of 132 pigeons from four different farms were examined for the presence of gastrointestinal parasites. Faecal samples were obtained from individual birds and processed by gross examination, direct smear examination, flotation and sedimentation techniques. Overall 72.7 % of the birds harbored parasites including Ascaridia columbae (33.3%), Eimeria spp (31.0%), Capillaria columbae (17.4%) and Raillietina (9.0%). Most of the pigeons were more likely to harbor mixed infections (36.6%). In the present study, there is a relation between the occurrence of gastrointestinal parasitic infections with the age of the pigeons which showed that high prevalence in adults (75%) when compare to squabs (64.2%). Eimeria spp. was found to be higher in squabs than compare with adults.

Keywords: Ascaridia, Eimeria, Endoparasites, Pigeons, India, YSR Kadapa District.

Introduction

Domestic pigeons (Columba livia domestica) are ubiquitous in nature and associated with humans in every place around the world. Pigeons often occupying the premises of people and causes contamination of surroundings with their droppings. Pigeons are used as pets, cultural and religious symbols [1]. Domestic pigeons don’t go for migration, but if allowed they return to their nests from long distance due to their good homing ability. Pigeons can carry many parasites and pathogens to different flocks [2]. They can also serve as a source for different zoonotic diseases for humans [3]. Birds can be parasitized by a wide variety of ecto and endoparasites that is nematodes, trematodes, cestodes, acanthocephalans [4,5]. Due to an increased risk of exposure, parasites can lead to serious problems in birds due to confined housings, and stressed by injuries, illnesses, or adaptation to new environments [6]. A good knowledge about the parasitic disease of the pigeons would aid in the development of possible control measures, which may help in enhancing its survival and complement efforts towards public enlightenment. However, there is a huge literature on avian medicine including parasitic diseases little has been documented about the parasites in pigeons.

Materials and Methods

The Present study was carried out in four different pigeon farms located in Y S R Kadapa District of Andhra Pradesh, India. In each farm, birds were maintained in free range system. Study was carried out for a period of four months from November, 2013 to February, 2014 a total of 132 birds (104 adults and 28 squabs) were considered. From all the pigeons faecal samples were collected into a dry vial from the cloacal orifice by gently squeezing the abdomen. Examination of faeces was carried out by gross examination, direct smear technique, sedimentation and flotation techniques. Faeces were grossly examined for the presence of proglottids of cestodes. The direct smear technique was done for examination of coccidial oocysts and it was conducted by mixing a drop of water with bit of feces using an applicator stick on glass microscopic slide covered with cover slip and examined at low and high power. The flotation and sedimentation techniques were used for detecting eggs, cysts, oocysts [8,9]. The parasites were identified according to keys developed by Soulsby [10]. Different types of ova observed in individual samples from adults and squabs were recorded separately to know about the multiple parasitic infection status. Chi–Square Test was performed in between the two different groups of pigeons also carried out for their significance between the age group levels. Chi–Square Test was done with help of statistical software (SPSS-17). Based on the ‘P’ value significance was categorized in to three categories. P value above the 0.05 (P > 0.05) considered as difference was statistically not significant, if P value below the 0.05 (P < 0.05) it considered as statistically significant and P value less than 0.01 (P < 0.01) it can be treated as statistically highly significant.

Results

Results of the coprological examination were summarized in Table 1 & Figure 1. Out of the 132 pigeons examined, 96 (72.2 %) were infected by four species of parasite helminthes comprising one species of cestodes and two species of nematodes. The species of cestode was included Raillietina spp., while the nematodes were Ascaridia columbae and Capillaria spp. The intestinal protozoan parasite was Eimeria spp.

Among 132 pigeons, 36.6 % had multiple infections with internal parasites. Present study indicated that prevalence rate of various helminthes including Ascaridia columbae (33.3%), Eimeria spp. (31.0%), Capillaria columbae (17.4%) and Raillietina (9.0%). In the present study, higher infection rate was
recorded in adults (75%) when compared to squabs (64.2%). But it was statistically not significant difference between these two groups (P > 0.05).

Statistical analysis between the individual parasitic infections revealed higher prevalence of *Ascaridia columbae* than compared with other parasites in the present study. It was statistically significant (P < 0.01) than the remaining parasites *Capillaria columbae* and *Raillietina spp.* But, analysis between *Ascaridia* and *Eimeria* was statistically not significant (P > 0.05).

Significant difference was identified between the *Eimeria spp.*, *Capillaria columbae* and *Raillietina spp.* (P < 0.01). Higher prevalence of *Ascaridia columbae* and *Raillietina spp.* was noticed in adults compared with squabs. But, these two parasites were not statistically significant (P > 0.05). Similarly prevalence of *Eimeria spp.* and *Capillaria columbae* was noticed higher rate in squabs than compared with adults. In this, *Eimeria spp.* showed the higher statistically significant (P < 0.01) and *Capillaria columbae* was not statistically significant (P > 0.05).

### Table 1: The prevalence of endo-parasitic infections in different age groups in domestic pigeons.

<table>
<thead>
<tr>
<th>Name of the Parasite</th>
<th>Adults (104)</th>
<th>Nestlings (28)</th>
<th>Overall %</th>
<th>Chi square value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
<td>Number</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td><em>Ascaridia columbae</em></td>
<td>38</td>
<td>36.5</td>
<td>6</td>
<td>21.4</td>
<td>33.3</td>
</tr>
<tr>
<td><em>Eimeria spp</em></td>
<td>23</td>
<td>22.1</td>
<td>18</td>
<td>64.2</td>
<td>31.0</td>
</tr>
<tr>
<td><em>Capillaria columbae</em></td>
<td>16</td>
<td>15.3</td>
<td>7</td>
<td>25.0</td>
<td>17.4</td>
</tr>
<tr>
<td><em>Raillietina spp</em></td>
<td>12</td>
<td>11.5</td>
<td>0</td>
<td>0</td>
<td>9.0</td>
</tr>
<tr>
<td>Overall infected pigeons</td>
<td>78</td>
<td>75</td>
<td>18</td>
<td>64.2</td>
<td>72.2</td>
</tr>
</tbody>
</table>

NS: Statistically not significant (P > 0.05)
*: Statistically significant (P < 0.05)
**: Statistically highly significant (P < 0.01)

### Discussion

In the present study, high (72.2 %) parasitic infection was recorded and it might be due to constant source of infested droppings or infested intermediate hosts in the present location of study. Endoparasites in birds cause debilitation, retarded growth and hidden economic losses to the farmers [11].

In the present study, trematode parasitic ova were not detected. It might be due to presence of lower number of intermediate hosts. Upon gross examination of faeces, proglottids of cestodes were found in 12 samples. It was not possible to identify the cestodes as scolecis were missing. Due to presence of these cestodes birds were in lethargic state and proglottids were passed in faeces, diagnosis should be made at necropsy, where mucosal scrapings were examined microscopically to detect the cestode species [12]. In the present study *Raillietina* showed low prevalence (11.50%). It was lower compared with the other studies conducted by the Musa et al. and Msoffe et al. who recorded the 50% and 63% respectively [13,14].

*Ascaridia columbae* is one of the most common (33.3 %) helminth species in the present study. Heavy infection of *Ascaridia columbae* causes mild catarrhal enteritis, obstruction,
dilation and necrotic ulcers in small intestine. The low prevalence of *Capillaria* spp. infection (17.4%) was in consonance with the previous findings [1]. Prevalence of *Ascaridia* and *Capillaria* spp. infections were in association with the previous studies who recorded the occurrence of *Ascaridia* (32%) and *Capillaria* spp. infections (26%) in pigeons [15]. In the present study, young pigeons were more affected with *Capillaria*, when compare with the adult birds. It is due to lack of acquired immunity in the young pigeons. Infection can also occur in older birds and they can act as carriers, and an important source of infection for other birds [10].

Coccidia are common pathogenic parasites in pigeons. In the present study, coccidiosis is most commonly seen in young pigeons than in adult birds. Coccidiosis usually runs without clear clinical manifestations. Coccidiosis affected pigeons look like healthy, but have dullness and occasional watery diarrhoea [16].

Mixed parasitic infections were also recorded in the present study. This might be attributed to food preference at a particular time which determines the establishment of mixed or single infection [17]. In the present study there is a relation between the occurrences of gastrointestinal parasitic infections with the age of the pigeons which showed that high prevalence in adults (75%) when compared to squabs (64.2%) but it was not statistically significant (P > 0.05). A nestling also infected with parasitic infection which indicates early age infection [18].

Parasitic infection in pigeon can be affected by food supply, geographic location, climatic conditions and the availability of intermediate hosts. Usually pigeon are reared in semi-scavenging or scavenging system in our country. Due to constant contact with the soil these birds serve as reservoir for soil transmitted helminthes [19]. The gastro-intestinal parasites recovered from this study are common parasites of domestic chicken [20]. It might be due to the sharing of same food and water along with chicken. Based on the present study, different preventive and control measures can be formulated against infections.

**Conclusion**

The present study identified the overall prevalent parasite is *Ascaridia columbae* in all the birds. But, *Eimeria* spp. was higher in squabs than compare with adults.

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**References**