Prevalence of Gastrointestinal Helminths of Dogs: A Retrospective Study

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Prevalence of Gastrointestinal Helminths of Dogs: A Retrospective Study

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Abstract

A total of six hundred and eighty (680) cases of dogs visiting the Abia state veterinary clinic were examined to investigate the influence of age, breed, sex, and season on the prevalence of gastrointestinal helminth parasites (GIHP) of dogs from 2007-2012. It was observed from the results that out of six hundred and eighty (680) cases recorded, the prevalence of GIHP were *Ancylostoma* 217 (31.9%) *Toxocara* 81 (11.9%) tape worm 36 (5.2%). The age of the dogs significantly influenced the occurrence of *Ancylostoma* infections and *Toxocara* infections (p<0.05) while it has no association with tape worm infections. The season as a factor has influence on the infection and it is clear from the study (p<0.05) the influence of sex is not significant (p>0.05) while the influence of breed on the occurrence of ancylostomosis in local breeds was significant (p<0.05).

Keywords: *Ancylostoma*, tape worms, *Toxocara*.
Introduction

Dogs are associated with more than 60 zoonotic diseases among which parasites in particular, helminthosis, can pose serious public health concerns worldwide (Blagburn et al., 1996). Many canine gastrointestinal parasites eliminate their dispersion element (eggs, larvae, oocysts) by the faecal route (Rinaldi et al., 2006). Ascarids (Toxocara canis, T.cati) and hook worms (Ancylostoma species) are common intestinal parasites of dogs unlike Uncinaria species which infect both man and animals (Umoh and Asake, 1982). Hook worms which cause serious blood loss due to its blood sucking activity, acute gastrointestinal haemorrhages and anaemia due to rapidly developing blood loss, especially in pups, may result in death if present with Ascaridia especially Toxocara canis (kagira and kanyari, 2000). Regardless of the availability of effective medications to treat parasites, most parasites of dogs have highly evolved life cycles that makes their elimination impossible especially where the route of infection is through transmammary which ensure that disease may occur in suckled pups reared in a clean environment and nursed by a bitch which may have been recently treated with an anthelmintic and has a negative faecal egg count (Urquhart et al., 1996). Consequent of the fact dogs live in close proximity with human beings, there are zoonotic diseases that can be transmitted to human and cause serious consequences (Ugochukwu and Ejimadu, 1985). Transmission of zoonotic parasites could be through indirect contact with dogs secretions and excretions, infected water and food, and through direct contact with the dogs (Lappin, 2002). The main objective of this research was to determine the prevalence of gastrointestinal helminthes in pet dogs visiting the Umuahia Veterinary clinic in Abia state, Nigeria.

Materials and Methods

The study population used for the work were dogs presented to the Abia state Veterinary clinic Umuahia from 2007 to 2012. Records on these dogs were kept based on findings after routine parasitological faecal examinations for endoparasites, for instance faecal samples from the sampled dogs were collected per rectum or freshly voided faeces were used and the flotation technique was employed for helminth eggs examination. The data collected were analyzed in relation to breed, age, sex and season of the year, these data were subjected to statistical analysis to determine the influence of each of these factors on gastrointestinal helminth parasitic infections of dogs, hence, the prevalence of GIT infections on each of these factors was determined statistically using the chi square tests from the contingency tables. The analysis was done using SPSS (statistical package for social sciences) version 16.0 (Adeniyi and Oguntunji, 2011).

Results

A total of six hundred and eighty dogs (680) of various breeds, sexes and ages in both seasons of the year were examined. Based on the findings, the prevalence of the individual gastro intestinal helminth parasite were as follows.

Influence of Age Group

The prevalence according to age is as in table 1.

Table 1A: Age variations in the prevalence of Ancylostoma infections in dogs presented at the Abia state Vet clinic (2007-2012).

<table>
<thead>
<tr>
<th>Age (month )</th>
<th>No infected</th>
<th>No uninfected</th>
<th>Total</th>
<th>% prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6</td>
<td>63</td>
<td>47</td>
<td>110</td>
<td>57.2±10.18a</td>
</tr>
<tr>
<td>7-12</td>
<td>96</td>
<td>119</td>
<td>215</td>
<td>44.6±8.36b</td>
</tr>
<tr>
<td>More than 12</td>
<td>58</td>
<td>297</td>
<td>355</td>
<td>16.3 ±3.28c</td>
</tr>
<tr>
<td>Total</td>
<td>217</td>
<td>463</td>
<td>680</td>
<td></td>
</tr>
</tbody>
</table>

We therefore state that there is a strong association (p<0.05) between age and prevalence of Ancylostoma infections in dogs presented at Abia state vet. Clinic (2007-2012).
The age group are: puppies (0-6 months), young dogs (6 months – 1 year) and adults (above 1 year). The prevalence of gastrointestinal helminth parasite infection were as follows:

Puppies 109 (30.6%), young dogs 95 (81; 3%) adults (130 (60.4%). For the individual parasites, the prevalence amongst these age group (puppies, young and adults) were *Ancylostoma* spp (16.3%, 57.2%, 44.6%) *Toxocara* spp (12.9%, 19.05, 6.5%) tape worm (1.4%, 5.1%, 9.3%).

The age of the dog significantly influenced the occurrence of *Ancylostoma*, *Toxocara* and tape worm infections at (p <0.05).

**Table 1B.**  
Age (month) | No infected | No uninfected | Total | % prevalence  
--- | --- | --- | --- | ---  
0-6 | 21 | 89 | 110 | 19.0±5.10a  
7-12 | 46 | 309 | 355 | 12.9±3.18b  
More than 12 | 14 | 201 | 215 | 6.5 ±1.21c  
Total | 81 | 599 | 680 |  

We therefore state that there is a strong association (p<0.05) between age and prevalence of *Toxocara* infections in dogs presented at Abia state vet. Clinic (2007-2012).

**Table 1C.**  
Age (month) | No infected | No uninfected | Total | % prevalence  
--- | --- | --- | --- | ---  
0-6 | 20 | 195 | 215 | 9.3±4.20a  
7-12 | 11 | 99 | 110 | 5.1±3.15b  
More than 12 | 5 | 350 | 355 | 1.4±2.13c  
Total | 36 | 644 | 680 |  

We therefore state that there is a strong association (p<0.05) between age and prevalence of tape worm infection in dogs presented at Abia state vet. Clinic (2007-2012).

**Influence of Sex**

The prevalence according to sex is as in table 2.

Among three hundred and seventy seven (377) males and three hundred and three (303) female examined, there were seventy nine (79) positive cases for the male and seventy four (74) positive cases for the female. The prevalence of GIHP in the males and females were 20.7% and 24.3% respectively, the individual parasites prevalence respectively with males and females were *Ancylostoma* spp (8.4%, 9.2%), *Toxocara* (9.2%, 10.5%) tape worm (3.1 %, 4.6%).

**Table 2A:** Sex variations in prevalence of *Ancylostoma* infections in dogs presented at Abia state vet. Clinic (2007-2012).  
Sex | No infected | No uninfected | Total | % prevalence  
--- | --- | --- | --- | ---  
Male | 32 | 345 | 377 | 8.4±3.06a  
Female | 28 | 275 | 303 | 9.2±3.17a  
Total | 60 | 620 | 680 |  

We therefore state that there is no association (p>0.05) between sex and prevalence of *Ancylostoma* infections in dogs presented at Abia state vet. Clinic (2007-2012).

**Table 2B:** Sex variations in prevalence of *Toxocara* infections in dogs presented at Abia State vet. Clinic (2007-2012).  
Sex | No infected | No uninfected | Total | % prevalence  
--- | --- | --- | --- | ---  
Male | 32 | 342 | 377 | 9.2±3.20a  
Female | 32 | 271 | 303 | 10.5±4.15a  
Total | 64 | 613 | 680 |  

We therefore state that there is no association (p>0.05) between sex and prevalence of *Toxocara* infections in dogs presented at Abia state vet. Clinic (2007-2012).

**Table 2C:** Sex variation in prevalence of tape worm infection in dogs presented at Abia State vet. Clinic (2007-2012).

<table>
<thead>
<tr>
<th>Sex</th>
<th>No infected</th>
<th>No uninfected</th>
<th>Total</th>
<th>% prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>12</td>
<td>365</td>
<td>377</td>
<td>3.1±1.24(^a)</td>
</tr>
<tr>
<td>Female</td>
<td>14</td>
<td>286</td>
<td>303</td>
<td>4.6±2.19(^b)</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>651</td>
<td>680</td>
<td></td>
</tr>
</tbody>
</table>

We therefore state that there is no association (p>0.05) between sex and prevalence of tape worm infections in dogs presented at the Abia state vet. Clinic (2007-2012).

**Influence of Breed**

The prevalence according to breed is as in table 3. Three breeds of dogs were examined namely, local, exotic and cross. The prevalence of GIHP among these breeds were 46.1%, 32.7%, 39.3%.

**Table 3A:** Breed variations in the prevalence of *Ancylostoma* infections in dogs presented at Abia state vet. Clinic (2007-2012).

<table>
<thead>
<tr>
<th>Breed</th>
<th>No infected</th>
<th>No uninfected</th>
<th>Total</th>
<th>% prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>121</td>
<td>264</td>
<td>385</td>
<td>31.4±10.14(^a)</td>
</tr>
<tr>
<td>Exotic</td>
<td>30</td>
<td>98</td>
<td>128</td>
<td>23.4±4.18(^c)</td>
</tr>
<tr>
<td>Cross</td>
<td>43</td>
<td>124</td>
<td>167</td>
<td>25.7±6.13(^b)</td>
</tr>
<tr>
<td>Total</td>
<td>194</td>
<td>486</td>
<td>680</td>
<td></td>
</tr>
</tbody>
</table>

We therefore, state that there is a strong association (p<0.05) between breed and prevalence of *Ancylostoma* infections in dogs presented at Abia state vet. (2007-2012).

**Table 3B.**

<table>
<thead>
<tr>
<th>Breed</th>
<th>No infected</th>
<th>No uninfected</th>
<th>Total</th>
<th>% prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>34</td>
<td>351</td>
<td>385</td>
<td>8.8±5.10(^a)</td>
</tr>
<tr>
<td>Exotic</td>
<td>8</td>
<td>120</td>
<td>128</td>
<td>6.2±2.34(^c)</td>
</tr>
<tr>
<td>Cross</td>
<td>12</td>
<td>155</td>
<td>167</td>
<td>7.1±4.13(^b)</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td>626</td>
<td>680</td>
<td></td>
</tr>
</tbody>
</table>

We therefore state that there is no association (p>0.05) between breed and prevalence of *Toxocara* infections in dogs.

**Table 3C.**

<table>
<thead>
<tr>
<th>Breed</th>
<th>No infected</th>
<th>No uninfected</th>
<th>Total</th>
<th>% prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>23</td>
<td>362</td>
<td>385</td>
<td>5.9±4.16(^b)</td>
</tr>
<tr>
<td>Exotic</td>
<td>4</td>
<td>124</td>
<td>128</td>
<td>3.1±2.11(^c)</td>
</tr>
<tr>
<td>Cross</td>
<td>11</td>
<td>156</td>
<td>167</td>
<td>6.5±4.08(^a)</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>642</td>
<td>680</td>
<td></td>
</tr>
</tbody>
</table>

We therefore state that there is no association (p>0.05) between local and cross breeds presented at the Abia state vet. Clinic (2007-2012).

**Influence of Season**

The prevalence according to season is as in table 4. The prevalence of GIHP among rainy and dry seasons were 48.3% and 34.9%.

The individual GIHP prevalence in local, exotic and cross breeds were *Ancylostoma* (31.4%, 23.4%, 25.7%) *Toxocara* (8.8%, 6.2%, 7.1%) tape worm (5.9%, 3.1%, 6.5%) respectively.
Table 4A: Seasonal prevalence of *Ancylostoma* infection in dogs presented at.

<table>
<thead>
<tr>
<th>Season</th>
<th>No infected</th>
<th>No uninfected</th>
<th>Total</th>
<th>% prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainy season</td>
<td>138</td>
<td>285</td>
<td>423</td>
<td>32.6±9.16a</td>
</tr>
<tr>
<td>Dry season</td>
<td>56</td>
<td>201</td>
<td>257</td>
<td>21.7±4.10b</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>194</strong></td>
<td><strong>486</strong></td>
<td><strong>680</strong></td>
<td></td>
</tr>
</tbody>
</table>

We therefore state that there is strong an association (p<0.05) between season and *Ancylostoma* infections in dogs surveyed.

Table 4B.

<table>
<thead>
<tr>
<th>Season</th>
<th>No infected</th>
<th>No uninfected</th>
<th>Total</th>
<th>% prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainy season</td>
<td>49</td>
<td>374</td>
<td>423</td>
<td>11.5±6.15a</td>
</tr>
<tr>
<td>Dry season</td>
<td>23</td>
<td>234</td>
<td>257</td>
<td>8.9±3.81b</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>72</strong></td>
<td><strong>608</strong></td>
<td><strong>680</strong></td>
<td></td>
</tr>
</tbody>
</table>

We therefore state that there is a strong association (p<0.05) between season and *Toxocara* infections in dogs surveyed.

Table 4C: Seasonal prevalence of tape worm infections in dogs presented at Abia state vet. Clinic (2007-2012).

<table>
<thead>
<tr>
<th>Season</th>
<th>No infected</th>
<th>No uninfected</th>
<th>Total</th>
<th>% prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainy season</td>
<td>18</td>
<td>405</td>
<td>423</td>
<td>4.2±2.33w</td>
</tr>
<tr>
<td>Dry season</td>
<td>11</td>
<td>246</td>
<td>257</td>
<td>4.3±3.21x</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>29</strong></td>
<td><strong>651</strong></td>
<td><strong>680</strong></td>
<td></td>
</tr>
</tbody>
</table>

We therefore state that there is no association (p>0.05) between season and tape worm infections in dogs presented at Abia state vet. Clinic (2007-2012).

Discussion

It was observed that the most predominant and reported gastrointestinal helminth parasites (GIHP) infesting dogs presented at the Abia state veterinary clinic umuahia were *Ancylostoma, Toxocara* and tape worms in descending order, in contrast Roberson and Cornelius (1980) observed that Ascarid nematodes are the most common parasite of dogs.

The survey revealed an overall prevalence of GIHP infection to be (81.3%) which was in line with the findings of Umoh and Asake (1982) (83.3%) in zaira, Bobade and Olufemi (1979) (77.4%) in Ibadan and ugochukwu and Ejimadu (1985) (86.9%) in Calabar.

In this study, the significantly higher prevalence of intestinal helminthes in dogs was higher in pups under 12 months than in dogs over 1 year old (p<0.05). The same aspect occurred with the specific prevalence of the three predominant GIHP which coincides with other studies (kirk Patrick, 1988, Pullola et al., 2006, Ramirez-Barrios et al., (2004). The significantly higher prevalence of nematode infection, specifically with *Ancylostoma* and *Toxocara* in young dogs as compared to adult is consistent with previous studies (Haralabidis et al., 1988, Overgaauw (1997). The higher prevalence of these nematodes in younger dogs could be due to the mode of transmission of the parasites and puppies could be infected transplacentally and transmammary, which increase the occurrence of the parasites at an early age where as adult dogs may develop immunity which decreases the establishment as well as the fecundity of the parasites (Soulsby 1982, Urquhart et al., 1996).

The study showed that there was no significant difference (p>0.05) in frequency of intestinal helminthes of dogs between male and female dogs.

The results are consistent with previous findings reported by Yacob et al., 2007. Despite the higher frequency in female (24.3%) compared with
male, (20.7%), there was no significant difference between sex and the GIHP though this findings is not in agreement with Nnaji (1992) which could be due to depressed resistance resulting from physiological condition due to lactation or periparturient rise in faecal egg count.

The result showed a high prevalence of GIHP infection in local breeds, which is not in agreement with Bobade and Olufemi (1977), this variation may be due to differences in management system, health care and degree of environmental contamination with infective stages and exposition to natural infection

(Yagoob, 2011). The result showed high prevalence of GIHP infection during the rainy season, this is in agreement with Okon et al., (1977) in Calabar that rainfall rather than temperature played a major role in the development and survival of the third stage larva (L3), this was confirmed by Okafor (1987) that development and survival of L3 occurred more during the rainy season.

References


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