Prevalence of endoparasites in pig in Chittagong, Bangladesh

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ABSTRACT

The aim of the study is to investigate the prevalence of endoparasites of pigs in Bangladesh. The study was conducted in different areas of Chittagong district from May to August, 2014. Fecal samples were collected from 86 pigs and examined by using direct smear and Stoll’s ova counting techniques. All animals were found infected with one or more species of parasites. Five species were identified, namely Schistosoma sp (24.41 %), Fasciolopsis sp (66.27%), Ascaris sp (70.93%), Strongyloides sp (38.37%) and Balantidium sp (52.32%). The prevalence of gastrointestinal parasites in relation to age and sex were examined. Data showed that there was no significant (p>0.05) difference among piglets, growers and adults. No significant difference was observed in infection rates between male and female (p>0.05). EPG/CPG/OPG was calculated and ranged from 100-1500. It is concluded that gastrointestinal parasites were prevalent in pigs in the study area. However, further investigation is needed to find out possible impact of parasitic infestations of pigs on public health.

Keywords: Prevalence, parasitism, endoparasites, pig, Bangladesh.

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INTRODUCTION

In global perspective, pigs are used for production of meat and bristles (Long et al., 1990). Pork is an important source of protein in western countries (Hossain et al., 2011). In Bangladesh pigs are reared in some areas, such as in Chittagong Hill districts, Narayangonj, Mymensingh, Tangail, Naogaon, Dinajpur and Barisal districts by some ethnic communities for household consumption (Islam et al., 2006).

The indigenous pig predominates to smallholders where it is kept under the free range system and thrives on low planes of nutrition. These pigs are primarily scavengers, utilizing food scraps thrown away by people. The roaming of pigs favors the uptake of internal parasitic eggs, making the pigs particularly susceptible to infestation with internal parasites. Moreover, the warm and humid conditions of the tropics and the inadequate treatment of local pigs against parasitic diseases invariably cause them to carry heavy burdens of gastrointestinal nematodes. Pigs can harbor a range of parasites and diseases that can be transmitted to humans. These include trichinosis, taeniasis, cysticercosis and fasciolosis. Gastrointestinal parasites occur frequently in domestic pigs in all kinds of production systems and all around the world. Because pigs are omnivores and eat any kind of food, including dead insects, worms, tree bark, rotting carcasses, garbage, kitchen waste and even human excreta. Swine raised in intensive operations are less prone to gastrointestinal infection however; the large round worms (Ascaris sp), whipworms (Trichuris sp) and the nodular worms (Oesophagostomum sp) are often found in such operation (Weng et al., 2005; Eijck and Borgsteede, 2005). Nevertheless, they have generally received much less attention than other ruminant endoparasites. The main reason is presumably that most common porcine endoparasites very seldom cause clinical disease.

and therefore remain largely unrecognized by farmers.

The major helminth species in temperate pig production include *Ascaris suum*, *Trichuris suis* and *Oesophagostomum* sp. Despite the common subclinical course of infections, pigs infected with one or more of the above mentioned species have reduced food utilization and growth rate (Hale and Stewart, 1979; Hale et al., 1981, 1985). Sometimes larval migration of *Ascaris suum* results in substantial liver condemnations (reviewed by Roepstorff et al., 2011). They have also been associated with depressed immunity in infected animals leading to decreased ability to fight off infection, thereby predisposing them to concurrent infections with pathogens (Intervet, 2011).

Some porcine parasites can be transferred to humans, especially farmers directly or indirectly. *Ascaris suum* and *Trichuris suis* are zoonotic parasites and closely related to *Ascaris lumbricoides* and *Trichuris trichiura* which infect 1221 and 795 million people worldwide, respectively (De Silva et al., 2003). Pigs infected with gastrointestinal parasites is widely reported from all corners of the world and shown to be influenced by the type of pig management practiced. Poor husbandry practices along with extensive management are reported as risk factors of infection of pigs with GI parasites. In view of the above, it is assumed that helminthiasis is one of the major problems for the pig, but no attention has been paid to study the prevalence in pigs in Bangladesh. Considering the above facts, the present study was undertaken to investigate the prevalence of gastrointestinal parasitic infestations in pigs in Chittagong, Bangladesh.

**Selection of animal**

Eighty six (86) pigs were selected randomly irrespective of age and sex. The age of the pig was determined following the method described by Samad (2008). According to the age, the pigs were divided into three groups such as piglet (<7 month, n=30), growers (7-12 month, n=24), adult (>12 month, n=32). Pigs were grouped into males (n = 25) and females (n = 61).

**Collection and preservation of fecal Sample**

After taking all relevant information, samples (feces) were collected from selected pigs (86). About 10 grams of fecal samples were collected from freshly voided feces, directly from anus taking the hygienic measures to avoid contamination. Each sample was kept in separate polythene bag; tied carefully, numbered properly and the samples were preserved in 10% formalin. The fecal samples (with all required information) were brought to the laboratory and refrigerated at 4 degree celcius and examined as early as possible.

**Examination of fecal samples**

The fecal samples were processed for microscopic examination of egg, ova or cyst by direct smear method as described by Soulsby (1982). The ova / cyst of different parasites were identified according to the morphology and quantitative estimation modified Stoll’s Ova Counting technique for counting the EPG/CPG (eggs /cysts per gram of feces) Following the procedure described by Urquhart et al., 1996; Soulsby, 1982.

**Statistical analysis**

The data were entered into Microsoft Excel and analyzed through SPSS (Version 2007).

**RESULTS AND DISCUSSION**

**Prevalence of gastrointestinal parasites in pigs**

During this study period, a total of 86 fecal samples were examined. All the samples (100%) were found to be infected with one or more species of endoparasites. Five types of endoparasites were...
Table 1
Overall prevalence of gastrointestinal parasites of pig (n=86).

<table>
<thead>
<tr>
<th>Name of parasites</th>
<th>No. Infected</th>
<th>Prevalence (%)</th>
<th>EPG Range</th>
<th>ME ± SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schistosoma sp.</td>
<td>21</td>
<td>24.41</td>
<td>100-300</td>
<td>29.41±6.44</td>
</tr>
<tr>
<td>Fasciolopsis sp.</td>
<td>57</td>
<td>66.27</td>
<td>100-700</td>
<td>103.53±12.80</td>
</tr>
<tr>
<td>Ascaris suum</td>
<td>61</td>
<td>70.93</td>
<td>100-500</td>
<td>120±12.39</td>
</tr>
<tr>
<td>Strongyloides sp.</td>
<td>33</td>
<td>38.37</td>
<td>100-1000</td>
<td>108.24±20.51</td>
</tr>
<tr>
<td>Balantidium coli</td>
<td>45</td>
<td>52.32</td>
<td>100-1500</td>
<td>228.24±33.08</td>
</tr>
<tr>
<td>Overall</td>
<td>86</td>
<td>100</td>
<td>100-1500</td>
<td>117.89±17.04</td>
</tr>
</tbody>
</table>

Table 2
Age related prevalence and burden of eggs of endoparasites in pigs (n=86).

<table>
<thead>
<tr>
<th>Parasites</th>
<th>Piglet (&lt;7 Months, N=30)</th>
<th>Grower (7-12 Months, N=24)</th>
<th>Adult (12 Months, N=32)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of infected (% Prevalence)</td>
<td>EPG (ME±SE)</td>
<td>No. of infected (% Prevalence)</td>
</tr>
<tr>
<td>Schistosoma sp.</td>
<td>11 (36.67)</td>
<td>100-300 (47±13.3)</td>
<td>7 (29.17)</td>
</tr>
<tr>
<td>Fasciolopsis sp.</td>
<td>20 (66.67)</td>
<td>100-1500 (110±22.2)</td>
<td>10 (41.67)</td>
</tr>
<tr>
<td>Ascaris suum</td>
<td>22 (73.33)</td>
<td>100-500 (137±22.2)</td>
<td>18 (75)</td>
</tr>
<tr>
<td>Strongyloides sp.</td>
<td>10 (33.33)</td>
<td>100-1000 (143±46.7)</td>
<td>10 (41.67)</td>
</tr>
<tr>
<td>Balantidium coli</td>
<td>16 (53.33)</td>
<td>100-1500 (223.3±57.3)</td>
<td>13 (54.17)</td>
</tr>
<tr>
<td>Total</td>
<td>30 (100)</td>
<td>100-1500 (132.06±32.34)</td>
<td>24 (100)</td>
</tr>
</tbody>
</table>

P-Value P=0.519
P>0.05=Statistically Non Significant

Table 3
Sex related prevalence and burden of eggs of endoparasites in pigs (n=86).

<table>
<thead>
<tr>
<th>Name of parasites</th>
<th>Male (25)</th>
<th>Female (61)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of infected (% Prevalence)</td>
<td>EPG (ME±SE)</td>
</tr>
<tr>
<td>Schistosoma sp.</td>
<td>3 (12)</td>
<td>100-300 (20±12.9)</td>
</tr>
<tr>
<td>Fasciolopsis sp.</td>
<td>16 (64)</td>
<td>100-700 (112±29.6)</td>
</tr>
<tr>
<td>Ascaris suum</td>
<td>16 (64)</td>
<td>100-300 (120±22.4)</td>
</tr>
<tr>
<td>Strongyloides sp.</td>
<td>9 (36)</td>
<td>100-700 (116±40.3)</td>
</tr>
<tr>
<td>Balantidium coli</td>
<td>14 (56)</td>
<td>100-1500 (276±75.1)</td>
</tr>
<tr>
<td>Overall</td>
<td>25 (100)</td>
<td>100-1500 (128.8±36.06)</td>
</tr>
</tbody>
</table>

P-Value P=0.562
P>0.05=Statistically Non Significant
Figure 1
Prevalence of different parasitic eggs in the study population. T= Error Bar

Figure 2
Age related prevalence in pigs. T= Error Bar.
Figure 3
Sex related prevalence of gastrointestinal parasitic infection in pigs. T= Error Bar

Figure 4
Egg of endoparasite of pig. a) egg of *Schistosoma* sp. b) Egg of *Fasciolopsis* sp c) Egg of *Ascaris* sp. d) Egg of *Strongyloides* sp. e) Cyst of *Balantidium* sp; view at 40X.
detected. Among them two species were trematode namely, Schistosoma sp. (24.41%) and Fasciolopsis sp. (66.27%); two species were nematode Ascaris suum (70.93%) and Strongyloides sp. (38.37%); one species of protozoa, Balantidium coli (52.32%). In this study, EPG/CPG was ranged from 100-1500. The highest CPG was observed in Balantidium coli (1500) followed by Strongyloides sp., Fasciolopsis sp., Ascaris suum and lowest in case of Schistosoma sp. (300). Mean EPG/CPG ± SE, count was also higher in case of Balantidium coli followed by Ascaris suum, Strongyloides sp., Fasciolopsis sp. and lowest in case of Schistosoma sp. (Table 1).

During the investigation, all pigs were found infected with one or more species of parasites. Similar results were reported by Islam et al., (2013) and Ruta et al., (2009), who reported that 100% pigs were found to be infected with endoparasites in Bangladesh and Italy, respectively. On the other hand, more or less similar results were found by Dey et al., (2013), and Tamboura et al., (2006) who reported 96.4%, 94.8% and 91% prevalence, in Bangladesh, Uganda and Burkina Faso, respectively. But in the present study the value was higher than reported by Tomass et al., (2013) in Ethiopia (72%) and Tiwari et al., (2009) in Grenada (68.78%). In this study, irrespective to age and sex, overall prevalence of Ascaris sp. was 70.93%. The lower prevalence from the present study was found by Tomass et al., (2013) in Ethiopia (25.9%). The differences in the prevalence might be due to the differences in geographical distributions, climatic conditions, deworming status, breeds and husbandry practice in the study area.

Age related prevalence of endoparasites

In this study, all age groups were equally infected with gastrointestinal parasites. The prevalence among the age groups were statistically insignificant (p>0.05). The prevalence of parasites in different age group is shown in Table 2. It was revealed that, age of pig had no significant (p>0.05) effect on endoparasitic infection. All age groups were equally infected with endoparasites. The present study was supported by Pam et al., (2013), Tiwari et al., (2009) and Nsoso et al., (2000) who reported that the prevalence had no significant (p>0.05) effect on age groups in Plateau State, Grenada and Botswana, respectively. The present finding disagreed with Dey et al., (2013) who reported that there was significant (p<0.05) difference in age group in Mymensingh district of Bangladesh. The differences between the present and previous studies might be due to husbandry practices, number of animal examined, acquired resistance by the older group and geographical location of study area.

Sex related prevalence of gastrointestinal parasite infection

In the present study, there was no significant difference in respect of (p>0.05) sexes. The prevalence of identified parasites according to the sex of animals is presented in Table 3. It was recorded that the sex difference has no significance on the prevalence of the endoparasites. Pigs in both sexes were equally infected. The present study was supported by Dey et al., (2013), Pam et al., (2013) and Nsoso et al., (2000), who reported insignificant difference between sexes in Bangladesh, Plateau State and Botswana, respectively. This finding differed from the earlier study of Tamboura et al., (2006) and Sowemimo et al., (2012), who reported that the prevalence of endoparasites in relation to sex had significant effect (p<0.05) in Burkina Faso and Nigeria, respectively. The differences might be due to rearing system, feed habit number of animal examined etc.

CONCLUSION

It can be concluded that the identified endoparasites were prevalent in pigs in the study area. There was no significant effect of prevalence in relation to age and sex. Because there was at least one or more species of parasites found in each sample. The intensity of endoparasitic prevalence was very high in scavenging pigs. Further study is needed to determine the topographical variation, seasonal pattern of the diseases as well as different breeds of pigs.

REFERENCES


