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Research Article
Prevalence of Gastro-intestinal Parasitic Infestation of Pigeon at Sylhet District in Bangladesh

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Abstract

Background and Objective: The gastrointestinal tracts of pigeon harbor a variety of helminthes, which cause clinical and sub clinical parasitism of pigeon. Epidemiological pattern of the helminthes diseases would provide a basis for evolving strategic and tactical control of different diseases. This study aimed at providing information on pigeon species composition, prevalence and distribution at Sylhet district in Bangladesh. **Materials and Methods:** The study was conducted from the period of 1st July, 2016-31st December, 2016. For the purposes, total 50 pigeon's feces were collected and examined coprologically in the laboratory, Department of Medicine, Sylhet Agricultural University, Sylhet. All the collected data were entered to MS excel sheet and analyzed by using SPSS version 13. **Results:** A total three species of gastro-intestinal (GI) parasites were *Ascaridia* sp., *Capillaria* sp. and *Raillietina* sp., were identified. The prevalence of *Ascaridia* sp., *Capillaria* sp. and *Raillietina* sp., were 30, 10 and 28%, respectively. The overall prevalence of GI parasites was 68%. From the epidemiological survey it was revealed that the prevalence of GI parasitic infestation was relatively high in year round. The age, sex and season were highly enhancing the prevalent rate. The temperature and humidity become optimum for larval development of parasites. **Conclusion:** It is an important study for the identification and factors analysis for the occurrence of GI parasites in Sylhet. Only routine anthelmintics practices and hygienic management can minimize the parasitic load of pigeons in this area. Therefore, more epidemiological studies are necessary to know the exact situation of parasitic infestation in pigeon of Sylhet district in Bangladesh.

Key words: Helminths, prevalence, anthelmintics, strategic, tactical, larvae, epidemiology

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Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Bangladesh is a developing nation where poultry industry is a rising sector. Being an integrated part of the livestock sector, poultry farming plays an important role in the agro-based economy of Bangladesh. Pigeons of the order Columbiformes are ubiquitous species of birds and can be found in virtually every town and city around the world[1]. The affiliation of pigeons with human has been reported from 3000-5000 BC. They live side by side with human as a source of food, hobby and experimental purposes[2]. 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[3]. Like other microbes, it also harbors various parasitic diseases, among these, gastrointestinal helminths are the most deleterious parasites responsible for occurrence of clinical and subclinical parasitic conditions[4] . There are a large number of problems related to parasitic infestation in birds. Clinical and sub-clinical parasites lead to anemia as a result of continuous suckling of blood by parasite. Such complications in young pigeon lead to death[5]. The close contact of pigeons with other domestic birds increases risk of parasitic infestation in birds and carrier of a possible zoonotic potential for transmission of disease to human. Various diseases are mainly spread through fecal dust from cages contaminated with dry droppings and urine. Several problems are associated with pigeon health. In the last few decades, large number of pigeons death have been reported and necropsy finding revealed occurrence of parasitic infestation[2]. There are majority of countries suffer from shortage of animal protein. The inadequate supply of animal proteins for human consumption in underdeveloped countries is further aggravated by many prevalent factors limiting animal productivity within the affected countries. All over the country the demand of pigeon is increasing day by day. Poor husbandry system, hazardous seasonal variation such as heat stress, disease, various parasitic infestations causes great loss both for the owner and country. There are many endo and ectoparasites which causes great loss of pigeon health and production[6]. Domestic pigeon 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. 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. They can also serve as a source for different zoonotic diseases for humans[4]. Keeping in view the economic importance of the parasitic infestations of the development of profitable poultry industry, the present work was designed to identify the GI parasites and also know the prevalence of parasitic infestation of pigeon at Sylhet district. In Sylhet, peoples are very crazy to rear pigeon in their roof of the building or in front of the house with a view to economic or esthetic purposes, but huge economic losses due to over parasitic load. The study will help to identify the parasites and also discover the effective anthelmintic drugs usable for proper control of these diseases for helping the pigeon owner expanding their pigeon business and contribute to the national economy.

MATERIALS AND METHODS

Study areas: The study was conducted at the local small holding farm and domestic pigeon at Sylhet district in Bangladesh. Identification and other experimental works were conducted in the laboratory of Department of Medicine, Faculty of Veterinary, Animal and Biomedical Sciences, Sylhet Agricultural University, 3100 Sylhet.

Home territory: Sylhet district with an area of 3490.40 km^2, is bounded by the Khasia-Jainta hills of India on the North, Maulvi bazaar district on the South, Kachhar and Karimganj districts of India on the East, Sunamganj and Habiganj districts on the West. The climate of Sylhet is humid subtropical with a predominantly hot and humid in summer and a relatively cool[7]. Annual maximum temperature is 33.2EC and minimum is 13.6EC, annual rainfall 3334 mm.

Study period, study population and sample collection: The study was conducted about 50 samples that were collected from domestic pigeon at Sylhet district in Bangladesh, aimed at providing information on their species composition, prevalence and distribution at Sylhet district in Bangladesh. Identification and other experimental works were conducted in the laboratory, Department of Medicine, Faculty of Veterinary Animal and Biomedical Sciences, Sylhet Agricultural University, 3100 Sylhet, during the period from 1st July, 2016-31st December, 2016. During these periods about 2 g of feces were collected and examined.

Laboratory examination: Fecal materials were collected and examined in laboratory by following methods.

Simple flotation method: Intestinal contents are thoroughly emulsified with a flotation fluid in a narrow tall cylinder. More

flotation fluid is added to the upper menisci of the fluid till at the brim of the cylinder. This is then allowed to stand for half an hour, a cover glass is applied to the surface of the fluid, is removed and placed with the wet side down on a clean slide for examination[8].

Direct smear method: A pin head drop of fecal material was put on a microscopic slide, mixed well with a drop of saline 0.9% by the aid of a wooden stick, covered with a cover glass slip and examined under high power 40× of light microscope for detection of egg in feces[8].

Statistical analysis: All the collected data were entered to MS excel (Microsoft Office 2007, USA) and analyzed by SPSS version 13 using F-test ($p>0.5$) and determined the prevalence of the parasitic infestation[9].

RESULTS

Occurrence of pigeon diseases is very common in Sylhet which is shown in Table 1. The present study was carried out 50 pigeons throughout Sylhet district of Bangladesh during the period from the period of 1st July, 2016-31st December, 2016. During the study period, both healthy and sick pigeon's feces were collected from small holding farmer's houses who reared pigeon as economic or esthetic purpose and examined in the laboratory. The laboratory examination includes simple flotation methods and direct smears methods. Symptoms of worms consist of weight loss as well as emaciation and in the case of severe multiple worm infestation diarrhea were seen in the pigeon. Infected young birds grow slower. Some of the birds were singly infected while others had multiple infections.

Out of 50, a total 34 samples were found to be infested with GI parasites with one or more species. This study did not show age wise prevalence or season wise prevalence but only show the individual prevalence and overall prevalence of GI parasites. The parasites have been identified in this study consisted of *Ascaridia* sp., *Capillaria* sp. and *Raillietina* sp., Among them 2 species were nematode namely *Ascaridia* sp., *Capillaria* sp. and one species was cestode namely *Raillietina* sp. Overall prevalence of GI parasite in pigeon is moderate in year round. The prevalence of *Ascaridia* sp., *Capillaria* sp. and *Raillietina* sp., were 30, 10 and 28%, respectively. This results revealed that among nematodal infection, *Ascarida* is very common in pigeon than *Capillaria*, but both were very harmful for pigeon health though it causes diarrhea and ultimate causes weight loss of pigeon sometime causes death which did not deserved by farmer. Cestode namely *Raillietina* is also harmful and causes the similar problem of nematode. The predilection site for cestodes was the small intestine while the nematodes were found in the small intestine and also caeca. The high prevalence among the parasitic infestation is *Ascaridia* sp., (30%) while less prevalence species is *Capillaria* sp., (10%). As a result the overall prevalence of parasitic infection is 68% (Table 1).

Table1: Gastro-intestinal parasitic infestation of pigeon in different region of Sylhet

Name of parasites	Positive (N = 50)	Prevalence (%)	Overall prevalence (%)
Ascaridia sp.,	15	30	68
Capillaria sp.,	5	10	
Railletina sp.,	14	28	

DISCUSSION

In the present study high parasitic infestation (68%) was recorded and it might be due to constant source of infested droppings or infested intermediate hosts. Endoparasites in birds cause debilitation, retarded growth and hidden economic losses to the farmers[10].This overall prevalence (68%) is slightly higher than 57% which is studied by Basit *et al.*[5]. Similarly the overall prevalence of helminthes was found slightly lower (74.14%) than that studied by Marques *et al.*[1]. The earlier observation was lower than the report of Parsani and Momin[11] who found 88.88% of overall prevalence. Senlik *et al.*[12] found helminthes infestation in 74 out of 100 necropsied domestic pigeon. Similarly, the overall prevalence of helminthes was found much higher (74.14%) according to the necropsy findings of Marques *et al.*[1]. 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 feces, proglottids of cestodes were found. It was not possible to identify cestodes as scolices were missing. Due to presence of these cestodes birds were in lethargic state and proglottids were passed in feces, diagnosis should be made at necropsy, where mucosal scrapings were examined microscopically to detect the cestode species[13]. In the present study *Raillietina* sp., showed moderate prevalence (28%) while Al-Barwari and Saeed[14] recorded 36.5% infect the pigeon. The prevalence of *Raillietina* sp., of this study was lower compare with the other studies conducted by the Musa, Msoffe. and Foronda, who recorded the 50, 63 and 44%, respectively[15-17] but almost similar to the study conducted by Abed *et al.*[18]. *Ascaridia* sp., is one of the most common (30%) helminth species in the present study. Heavy infection of the *Ascaridia* sp., causes mild catarrhal enteritis, obstruction, dilation and necrotic ulcers in small intestine. The prevalence of *Ascarida* sp., is

slightly similarity with the observation of Rabbi *et al.*[19] and much higher that recorded in India observed by Sivajothi and Reddy[20]. The low prevalence of *Capillaria* sp., infection (10%) was in consonance with the previous findings[2]. Similarly, occurance of *Capilaria* sp., was much lower than the observation by the Rabbi *et al.*[19]. In the present study Ascaridia and Capillaria infection were 30 and 10%, respectively which is higher than Adang *et al.*[10] and almost similar with Borghare *et al.*[21]. Prevalence of Ascaridia and Capillaria infections were in association with the previous study who recorded the occurrence of Ascaridia (32%) and Capillaria (26%) infections in pigeons[4]. 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[22]. 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[23].

CONCLUSION AND RECOMMENDATION

The result of this study showed that the situation of the gastro-intestinal parasitic infestation of pigeon was moderate. The prevalence of *Ascaridia* sp., *Capillaria* sp. and *Raillietina* sp. were 30, 10 and 28%, respectively. So, the main threat of intestinal nematode of pigeon is *Ascaridia* sp. The threat of *Capillaria* sp., is lower than *Ascaridia* sp. and *Raillietina* sp. in the experimental area. These parasitic infections may cause great loss in production of poultry industry. This study revealed that the preliminary situation of the gastro-intestinal parasitic infestation of pigeon in Sylhet district. It should be helpful for the Department of Livestock Service of Bangladesh for designing fruitful control programmed against parasitic disease of pigeon.

My recommendation for controlling the protozoan infestation of pigeon is to maintain the sufficient hygienic measure taken of the flock, provide fresh feeds to the pigeon. For the treatment of parasitic infestation of pigeon needs to be using many antiparasitic drugs. After all it is said that, further studies should be conducted to identify protozoa, but it would be better if a sero-surveillance could be conducted. Result of sero-surveillance would give an idea about the endemic stability.

SIGNIFICANCE STATEMENT

This study will help the potential scientists who have charm to reveal the undiscovered area of parasitism in pigeon. It also helps to develop effective anthelmintics drugs against the identified species of parasite of pigeon.

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