Research in
AGRICULTURE, LIVESTOCK and FISHERIES
ISSN : P-2409-0603, E-2409-9325
An Open Access Peer-Reviewed International Journal

Article Code: 0241/2019/RALF
Article Type: Original Research

Res. Agric. Livest. Fish.
Vol. 6, No. 2, August 2019 : 323-328.

CHEMOTHERAPY OF GASTROINTESTINAL PARASITIC DISEASES IN DOMESTIC PIGEONS (*Columba livia)* IN RAJSHAHI DIVISION OF BANGLADESH

Shaziea Rahman*, Rashida Khatun , Lavely Nahar and Tanjila Khanum

Department of Veterinary and Animal Sciences, University of Rajshahi, Rajshahi-6205, Bangladesh.

***Corresponding author:** Shaziea Rahman; E-mail: bshaziea@yahoo.com

ARTICLE INFO

Received
06 August, 2019

Revised
23 August, 2019

Accepted
26 August, 2019

Online
31 August, 2019

Key words

Chemotherapy, Gastrointestinal parasitic diseases, Domestic pigeons

A B S T R A C T

The present study was undertaken to find out the prevalence of gastrointestinal nematodes in pigeon (*columba livia)* at Rajshahi division from 01-01-2016 to 15-12-2016 and to evaluate the comparative efficacy piparazine citrate and levamisole HCL. Total 3 different species of parasites were recorded in this study and those were *Ascaridia columbae, Capillilaria obsignata, Raillietina tetragona.* Out of 263 pigeon, 109 pigeon having ascarid and capillaria positive were treatment with piparazine citrate and levamisole HCL. The pigeon were treated with recommended (10g mixed in 6 litre drinking water for 100 pigeon) dose of Ascarex® and recommended (1gm mixed in 1 litre drinking water) dose of Avinex® orally, respectively. The recovery rate of ascariasis at 7^{th} days was 50.9% and capillariasis was 51.85%. After 21th days the recovery rate of ascariasis was 72.72% and capillariasis was 66.66%. The efficacy of drugs is more in case of young (77.27% at 7^{th} days and 87.36% at 21^{th} days) than adult (44.82% at 7^{th} days and 65.51% at 21^{th} days).In exotic breeds efficacy is good (60.41% at 7^{th} days and 85.41% at 21^{th} days) than indigenous breeds (44.26% at 7^{th} days and 66.65% at 21^{th} days). The recovery rate is more in traditional (65.3% at 7^{th} days and 78.33% at 21^{th} days) than commercial farming system (42.85% at 7^{th} days and 58.33% at 21^{th} days).

To cite this article: S Rahman, R Khatun, L Nahar and T Khanum, 2019. Chemotherapy of gastrointestinal parasitic diseases in domestic pigeons (*Columba livia)* in Rajshahi division of Bangladesh. Res. Agric. Livest. Fish. 6 (2): 323-328.

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. The geo-ecological condition of Bangladesh is suitable for rearing of pigeon (Rahman, 1999). Pigeon rearing is popular in rural areas in this country. Although, a good many households in the rural areas specially middle and large households rear some pigeons but there is no definite statistics of pigeon population in Bangladesh. The pigeon are self-reliant in forage and capable of withstanding with minimal care and management. So, minimum cost required for the rearing of pigeon. Helminth infections have an important role causing hidden economic losses in the production of pigeon. Also, they may have particularly deleterious or debilitating effects on infected pigeons, especially the squabs, causing retarding growth, interfering with healthy development, and making older birds prone to secondary infections (Adang *et al*. 2008).Very few studies have been undertaken so far to determine the prevalence of gastrosintestinal helminth infection in pigeon in Bangladesh. No such studies have been done in Rajshahi region.

The present study was undertaken to find out the prevalence of gastrointestinal helminths infection in pigeon in Rajshahi district and to evaluate the comparative efficacy of piperazine citrate and leamisole HCL against gastrointestinal nematodes. There are many broad spectrum anthelmintics available in market. Among them for assessing the comparative efficacy of piperazine citrate and leamisole HCL are best anthelmintics for treatment of gasrointestinal nematodes in pigeon. These two drugs are relatively safe but highly efficacious broad spectrum anthelmintics to kill most of the gastrointestinal nematodes in pigeon. So these two anthelmintics were choice for the best treatment against the gastrointestinal parasitic diseases of pigeon.

MATERIALS AND METHOD

Total 3 different species of parasites were recorded in this study. Those were *Ascaridia columbae,Capillilaria obsignata,Raillietina tetragona*. The project was designed to observed the gastrointestinal nematodes in domestic pigeon (*Columba livia)* in Rajshahi devision of Bangladesh. Different types of anthelmintics had been used for the specific diseases according to their treatment groups .The diagnosed pigeon diseases was treated with two different drugs for their evaluation of comparative efficacy at recommended dose rate. For this purposes 263 fecal samples were collected from affected pigeon in clean polythene bags to prevent moisture. The following drugs were used to control the pigeon gastrointestnal parasitic diseases. Piperazine citrate in generally used for the paralisation of parasites, which allow the body to easily remove or expel the invading organism. Ascarex^{R} powder was administered 10gms to 100 pigeons mixed with 6 liters drinking water. Levamisole is a broad-spectrum anthelmintic that acts on both mature and immature stages of many important gastrointestinal nematodes and lungworms in cattle, sheep, pigs, poultry and pigeons. In susceptible nematodes Levamisole inhibits the neuromuscular transmission of stimuli. Immediately after administration, Levamisole causes the neuromuscular paralysis of the parasite that the host expels within 24 hours. Avinex^{R} 1 liter drinking water 1 gm powder for 50 pigeons was administered.

RESULTS AND DISCUSSION

The overall efficacy of piparazine citrate (47.14%at 7th day and 70% at 21th days) was higher than the lemamisole HCL (58.97% at 7th days and 69.23% at 21th days) during the time of experimental trial (Table 1).

Table 1. Overall efficacy of drugs

Drugs	Parasites	7 days	21 days
Piperazine citrate	Ascariasis = 40	21 (52.5)%	32 (80)%
	Capillariasis = 30	12 (40)%	17 (56.66)%
	Total = 70	33 (47.14)%	49 (70)%
Levamisole HCL	Ascariasis = 15	7 (46.66)%	8 (53.33)%
	Capillariasis = 24	16 (66.66)%	19 (79.16)%
	Total = 39	23 (58.97)%	27 (69.23)%
Grand Total	109	56 (51.37)%	76 (69.72)%

The study was also shown that the grand total of the rate of parasitic infections 51.37% at 7th and 69.72% at 21th day.

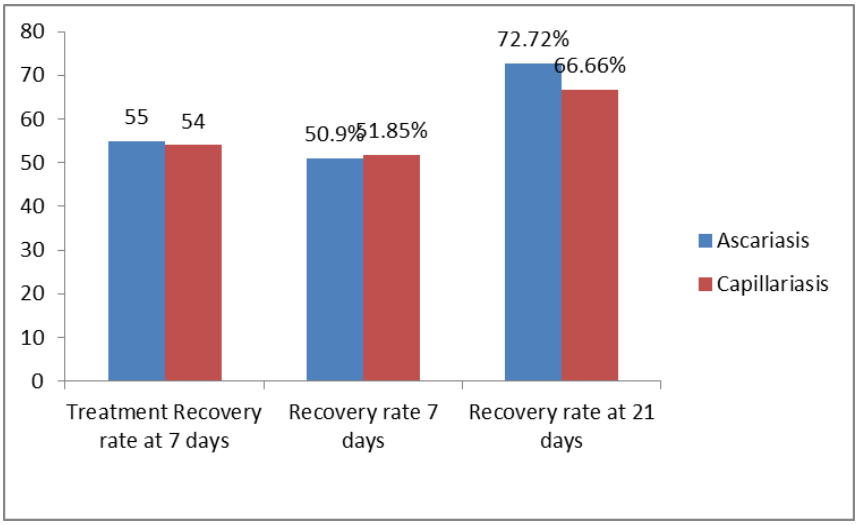

Figure 1. Overall efficacy of drugs

Recovery rate of ascariasis at 7 days is 50.9% and capillariasis is 51.85%. Recovery rate 21 days of ascariasis is 72.72% and capillariasis was 66.66% (Figure 1). During the period of trial with piparazine and levamisole drug in young pigeon at 7th day is 77.14% and 21th day is 87.36% and in case of adult pigeon the rate of infection is 44.82.97% in 7th day and 65.52% at 21th day (Figure 2).

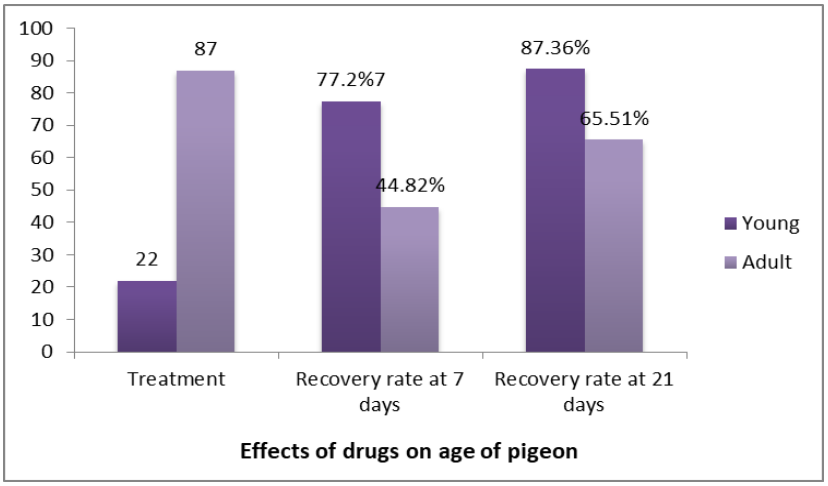

Figure 2. Effects of drugs on age of pigeon

Recovery rate of young at 7 days is 77.27% and adult at 44.82% and 21 days of young is 87.36% and adult is 65.51%. In exogenous breed the recovery rate of infection is lower than indigenous breed. In indigenous breeds the efficacy of anthelmintics was lower than exotic breeds. The rate of efficacy is 44.26% in 7th day and 66.66% in 21th day in indigenous breed. In exotic breed the efficacy is 60.41% in 7th day and 85.41% in 21th day (Figure 3).

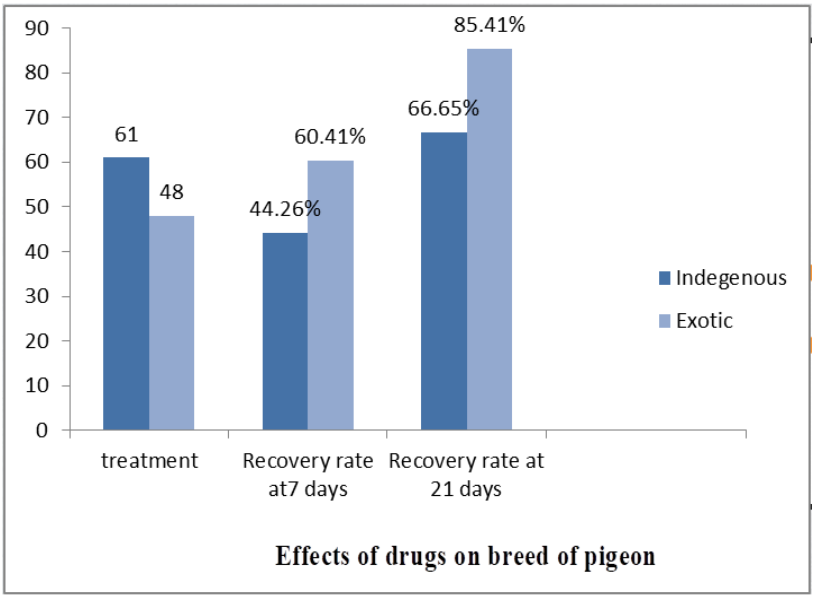

Figure 3. Effects of drugs on breed of pigeon

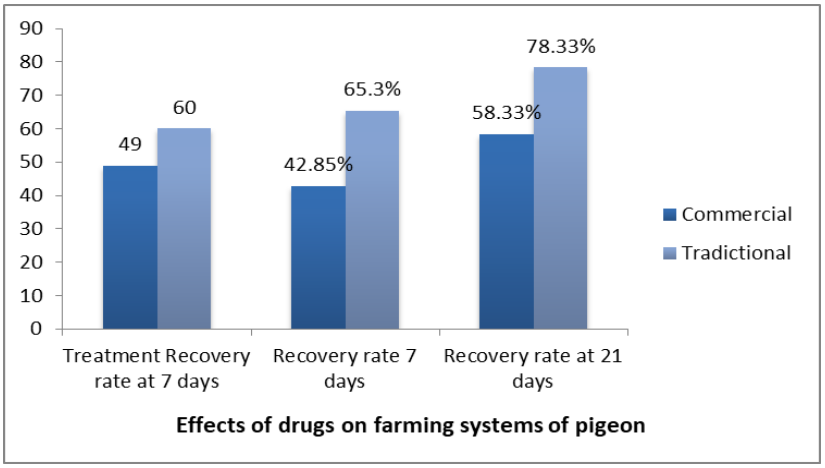

Figure 4. Effects of drugs on farming system of pigeon

Recovery rate of Indigenous breed at 7 days is 44.26% and Exotic breed is 60.41% and recovery rate at Indigenous breed is 66.65% and exotic breed was 85.41%. It was 44.26% in 7th day and 66.65% 21th in indigenous breed and 60.41% in 7th day and 85.41% in 21th day in exotic breed by the treatment with piparazine and levamisole. Our results with piperazine citrate which showed excellent activity (100%) against adult *Ascaris dissimilis* and no significant activity against *Heterakis spp,* confirm the numerous reports on the activity of piperazine compounds against poultry helminths (Alicata, et al.,1958 and others). Also, the results suggest significant activity against Capillaria, but no activity against immature Ascaridia.Thus, piperazine citrate is primarily useful against adult *Ascaris spp*. in turkeys. Prior to the development of tetramisole, only two anthelmintics showed significant activity against capillariasis in birds, i.e., Chevis R.A.F.*et al.,* 1980 and Robertson, *et al*. 2017. Several investigators have demonstrated the anthelmintic effects of levamisole HCL against nematode infestation in poultry and fowls. Our findings agree with those of Altaf (1972), who reported 99% reduction in fecal egg count by using levamisole at 40 mg/kg body weight in chicken.

In commercial farming system recovery rate of infection is lower than traditional farming. It is 42.85% in 7th day and 58.33% 21th in commercial farming and in traditional farming the rate is 65.3% in 7th day and 78.33% in 21th day by the treatment with levamisole and 52.63% in 7th day and 70% 21th in commercial farming and in traditional farming the rate is 65% in 7th day and 90.2% in 21th by the treatment with levamisole.

Recovery rate of commercial farming at 7 days is 42.85% and traditional farming is 65.3%. In 21 days recovery rate of commercial is 58.33. From this study it can be concluded that domestic pigeon do harbour gastro-intestinal nematodes and treatment with the piparazine citrate and levamisole HCL is a drug of choice in domestic and wild pigeons which are more effective.

ACKNOWLEDGEMENT

The authors are grateful to the authority and all concerned technical staffs of the Department of Veterinary and Animal Sciences, Faculty of Agriculture, University of Rajshahi, Rajshahi, Bangladesh for efforts in providing data for this study.

CONFLICT OF INTEREST

There is no conflict of interest in this study.

REFERENCES

1. Adang KL, SJ Oniye, OJ Ajanusi, AU Ezealor and PA Abdu, 2008. Gastrointestinal helminths of the domestic pigeons (*Columba livia domestica* Gmelin, 1789 Aves: Columbidae) in Zaria, Northern Nigeria. The Scientific World Journal, 3: 33-37.
2. Altaf KI, 1972. Comparative evaluation of efficacies of tettramosole and piparazine against Ascaridia galli in chicken. Amer. Journal of Veterinary Research, 33(7): 1547-1549.
3. Alicata JE, 1959. The Effect of Piperazine Citrate on Egg Production Ernest Ross, Poultry Science, 38(1): 230–231.
4. Chevis R.A.F.,Eva-MariaBennet,CarolynBehm,C.Bryant,1980.Synergistic action of mebendazole and levamisole in the treatment of a benzimidazole-resistant *Haemonchus contortus* in sheep, Veterinary Parasitology, 7(3): 207-214.
5. Robertson CJ, W Love, LA Kelly, HE Lester, I Nanjiani and MA Taylor, 2017. Investigating anthelmintic efficacy against gastrointestinal nematodes in cattle by considering appropriate probability distributions for faecal egg count data, International Journal for Parasitology: Drugs and Drug Resistance, 7(1): 71-82.
6. Rahman MA, 1999. Pigeon world 1st Published, Khatun, A. A. Savar Dhaka, Bangladesh.