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PREVALENCE AND CHEMOTHERAPY OF HELMINTHIASIS IN PARROTS AT LAHORE ZOO, PAKISTAN

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ABSTRACT

A total of 130 faecal samples were collected from various breeds of parrots. Eighty eight samples were found positive for single or mixed infection of *Heterakis gallinae* and *Ascardia galli.* Faecal samples were examined for counting of egg/gram of faeces using McMaster egg counting technique having overall prevalence of 67.70 % with individual relative percentage as 73.86 and 26.14 respectively.The birds were divided into four groups; group A, B, C and D. Group A was treated with albendazole, group B with Levamisole, Group C was kept as untreated infected control and group D was untreated and uninfected control. Albendazole was found to be highly effective (96.33%) as compared to levamisole (84.90%) against gastro-intestinal nematodes in parrots.

Key words: Helminthiasis, Enteritis, Chemotherapy, Albendazole, Levamisole

INTRODUCTION

Helminthiasis in birds produces pathogenic conditions ranging from dilations of gut and nodule formation to severe enteritis. It adversely affects the health of birds during heavy infestation.

Parrots are beauty of nature and contribute a lot in eco-system and are commonest fancy game birds through out the world. Parasitic infestation although are not acute in nature but are cause of continuous and sustained economic losses in birds. The gastro-intestinal tract of parrots harbors a wide variety of helminths, of which nematodes and cestodes are the most deleterious parasites and are responsible for clinical and sub clinical parasitism. Cestodes or tapeworm infections are not uncommon in *Psittacus* species, such as *Timneh* and *Congo greys*. Nematode infections are sometimes found in birds housed outdoors and are invariably roundworms (*Ascardia galli*) and *Capillaria spp* infections (Darrel, 1996). These helminths also damage the host by consuming nutrients and vitamins, decreasing feed utilization by the host causing intestinal obstruction, producing toxins in the host, exposing to various types of pathogen. etc.

Several cases of helminthiasis have been reported in various breeds of parrots by different scientists like *Ascaridia platyceri* (Weekes, 1981) in masked lovebird; *Hymenolepis macrorchida* (Spasskii, 1988); *Ascaridia*, tapeworm, microfilaria, *Hexamita,* and *Spiroptera* (Tsai *et al*., 1992) in psittacine and passerine birds, *Dispharynx nasuta* (Bolette, 1998) and in princess parrot, *Pterothominx moraveci* (Barus *et al*., 2005)

A broad range of anthelmentics have been used against helminth parasites such as albendazole and fenbendazole for their effectiveness in the treatment and prevention of histomonosis (blackhead) in turkeys (Hegngi *et al.,* 1999) levamisole against gastro intestinal tract nematodes by (Ihsanullah, 1999) levamisole HCl and oxfendazole against gastro-intestinal nematodes in common peafowl (*Pavo cristatus*) (Ashraf, *et al*., 2002) in different climatic areas.

This study will help the game bird owners about helminthiasis, its treatment and control, to minimize the parasitic infestation.

MATERIALS AND METHODS

A total of one hundred and thirty (130) faecal samples were collected in clean sterile prelabelled polythene bags. All the samples were examined using direct smear method.

Procedure: A small amount of fresh faecal material was placed on a clean glass slide, one or two drop of water was mixed thoroughly, forming a homogenous mixture. A cover slip was placed on the smear and examined under low power of microscope. As a result 67.7 percent faecal samples were found positive for various helminth infections.

Treatment trials: Out of 88 infected birds, 72 were randomly divided into 3 groups A, B and C, each comprising of 24 birds, While 24 uninfected birds were kept in group D. Group A (24 birds) consisted of love birds peach face breed and these birds were treated with albendazole (Farbenda, Farvet) @ 0.1ml/kg body weight. Group B (24 birds) consisted of budgerigar ring necked breed which were treated with levamisole (Nilverm drench, ICI) @ 5ml/litre of water. Group C (24 birds) consisted of Alexandrine parrots, Blossom headed parakeet and Blue fronted amazon breeds which were

kept as untreated infected control. Group D (24 birds) comprised of Cockatiel, Blue ring necked parakeet, Eclectus parrot and African grey parrot breeds which served as uninfected and untreated control.

The fecal samples were pre treatment and called as day 0 sample. After collection of fecal samples the birds in group A and B were given treatment. The dose rate for individual bird was calculated on body weight as per manufacturer recommendations. Drugs were administered orally to each bird using crop needle. All the fecal samples were examined through McMaster egg counting technique (Soulsby, 1982)**.** Further fecal samples of birds in all the groups were collected on day 3, 7 and 10 post medications. Two gram of faeces placed in a small screw capped plastic bottle containing glass beads. 60ml of saturated sodium chloride solution was added in the bottle. The contents were shaken gently to break up the faeces. The mixture was then poured through a 100-mesh sieve in to a small beaker and the mixture was allowed to stand or 15-20 minutes. The supernatant was withdrawn using Pasteur pipette to fill one chamber of the McMaster egg counting slide. After focusing a corner, the eggs were counted by moving the chamber up and down. The counting was repeated for the second chamber. The total number of eggs counted two chambers was multiplied by 50 to get the number of eggs per gram (EPG) of faeces.

E.P.G = N x 50

Where N = No. of eggs counted into two chambers.

Drug Efficacy*:* Controlled test was conducted for efficacy of drugs (Moskey and Harwood, 1941) on the basis of reduction in EPG (egg per gram) pre and post medication using the following formula:-

Percent efficacy = a - b/a × 100.

Where

a =EPG- pre-medication.

b =EPG- post-medication.

RESULTS AND DISCUSSION

Eighty eight out of 130 samples were found positive for single or mixed infection of *Heterakis gallinae* and *Ascardia galli* showing over all prevalence of 67.7 % while relative prevalence was recorded as 73.86 and 26.14 percent respectively**.** (Table-1, Fig-1)

Coprological examination of birds on day 0, 3, 7 and 10: The average numbers of nematode eggs in birds treated with albendazole (group A) were 1800 on day "0", pre-medication. The number reduced to 1066, 566 and 66 post medication on day3, 7 and 10 respectively.

The average faecal egg count in birds of group B treated with levamisole Hcl was 1100 pre-medication. This number reduced to 966, 566 and 166 post-medication on day 3, 7 and 10 respectively.

CHEMOTHERAPY

Comparative Antihelmintic Efficacy: Albendazole treatment reduced the faecal egg count of group A from 1800 (40.78 %), at day "0" to 1066 (68.56%), 566 and 66 on day 3, 7 and 10 of medication, with percentage efficacy of 40.78 %, 68.56% and 96.33 %, respectively. Levamisole treated Parrots of group B were found to have the reduction of EPG from 1100 on day "0" to 966, 566 and 166 on day 3, 7, and 10 of medication with percent efficacy of 12.18%, 48.55%, and 84.90%, respectively.

The average faecal egg count of untreated group C birds were found to have 1900 on day "0" (pre-medication) to 1966, 2066 and 2270 on day 3, 7, and 10 with 3.36%, 4.84% and 8.98% increase respectively.Albendazole was found to be highly effective (96.33%) as compared to levamisole (84.90%) which was less effective against gastro-intestinal nematodes in parrots.

Table – 1: Number and Percentage of Helminths species present in Parrots at Lahore Zoo

Helminth spp.	No. of positive birds (infected)	Relative Prevalence (%)
Heterakis gallinae	65	73.86
Ascardia galli	23	26.14
Total	88	(67.70)

n = 130

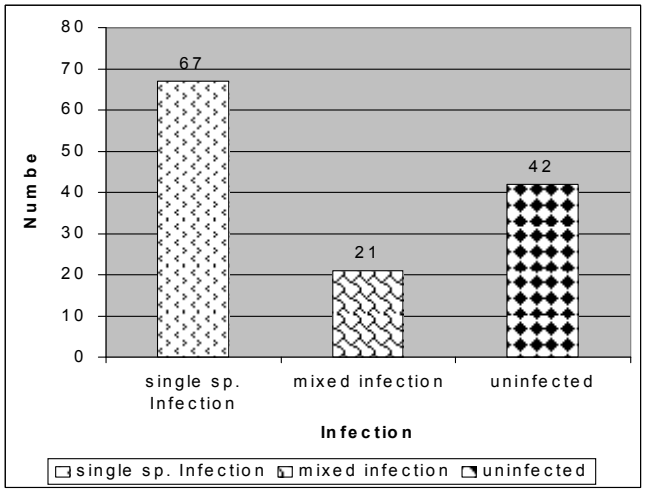

Fig-1: Overall infection rate of Helminthiasis at Lahore Zoo

During this study, two different species of nematodes were identified after examination of 130 bird's feacal samples. The data collected revealed 88 birds positive for helminth infection, with overall prevalence of 67.70 % and relative prevalence was

recorded as 73.86 and 26.14 percent of *Heterakis gallina and Ascardia galli* respectively.

The over all prevalence of gastrointestinal helminths (67.70 Percent) in the present study is closely related with the results of Mukaratirwa *et al*. (2004), Lierz *et al.* (2002), Fallacara *et al.* (2001), Wojcik *et al.* (1999) and Varghese (1987) who also reported 72.7 58.3, 66, 68, and 35.6-67.3 percent prevalence of gastrointestinal helminths respectively, whereas Ashraf *et al.* (2002), Ihsanullah (1999) and Gassal and Sehmaschke (2006) reported much higher incidence rate i.e, 80.77, 78.89, and 96.7 percent respectively. The difference in managemental conditions may be the cause of present variation in the prevalence.

The results are not in agreement with Ehlers (1985) who performed a survey to study the parasitic helminths in domestic fowl in Thailand and collected data from alimentary tract and trachea of 133 birds obtained from five provinces. The parasites recovered were: *A. galli* 64.35 percent, *H. gallinae* 37.12 percent, *Acuaria spiralis* 12.87 percent, and *Capillaria anulata* 5.84 percent. The variation in the intensity of infections may be due to many factors like breed differences, seasonal variations, and managemental practices, ecological conditions in the area and anthelmentic treatment.

The efficacy of albendazole (0.1ml/kg) against nematode infection in group A indicated that the efficacy was 40.78, 68.56 and 96.33 percent on day 3, 7 and 10 post medication, respectively. These finding are in close agreement with results of Ashraf *et al. (*2002) who observed 95.60 percent efficacy post medication. Where as Albendazole was highly effective against different helminths used in 29 brown pelicans by Grimes *et al. (*1989).

In the present study, the efficacy does not correlate with percent efficacy described by the Jiang and Li (1985) as they observed 100 percent efficacy. This variation can be attributed to genetic based resistance.

Result of the present study corroborate with the findings of Ihsanullah (1999) who reported 84.38% reduction in faecal egg count on day 07 post medication and Colglozier (1975) who observed that levamisole was highly effective against *Ascardia* and *Heterakis* and moderately effective against Capillaria in turkey. The present results are slightly in disagreement with Sharma *et al. (*1989) and Clarkson and Beg (1970) who reported that levamisole completely inhibited malate dehydrogenase activity in the parasites showing the 100 percent efficacy of levamisole. It also do not correlate with the results of Ashraf *et al. (* 2002) who observed 97.93 percent efficacy of gastro-intestinal nematodes in common peafowl (*Pavo cristatus*) at Lahore Zoo

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