POINT PREVALENCE OF GASTROINTESTINAL HELMINTHIASIS IN BUFFALOES (*Bubalus bubalis*) AT THE VICINITY OF JATOI, PUNJAB, PAKISTAN

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ABSTRACT: *In the year 2009, a total of 500 faecal samples from buffaloes from different locations of Tehsil Muzaffar Garh were analyzed to confirm the presence of gastrointestinal parasitic infection. The recovered parasites were five nematodes and two trematodes. The nematodes were Toxocara vitulorum (16.6%), Oesophagostomum radiatum (3.2%), Bunostomum phlebotomum(1.6%), Cooperia spp. (1.6%), Trichostrongylus spp (0.8%). The two trematodes were Fasciola hepatica (8.4%), Paramphistomum cervi (15%). Age wise prevalence was 79.5% and 47% in buffalo calf and adult buffalo, respectively while sex wise prevalence was 78.4% and 50.93% in male and female buffalo, respectively. To know the dependence of helminth's prevalence on sex and age of animals, Chi-square statistical design was applied to data.*

Key words: Buffaloes, Helminths, Prevalence, Jatoi, Pakistan

INTRODUCTION

Helminths are recognized as a major constraint to livestock production throughout the tropics and elsewhere [1, 2]. Helminth infections of water buffaloes are considered common in tropical and sub-tropical countries where they cause huge economic losses as a consequence of deaths of infected animals, reduced rates of weight gains and the condemnation of infected organs after slaughter [3]. Economic losses are caused by gastrointestinal parasitism are in a variety of ways: they cause losses through lowered fertility, reduced work capacity, involuntary culling, a reduction in food intake and lower weight gains, lower milk production, treatment costs, and mortality in heavily parasitized animals [4].

Prevalence of gastrointestinal helminthes in ruminants has been reported from 25 to 92% in different areas of Pakistan at different times [18, 24, 28, 29, 35, 36]. Facioliasis, parasitic gastro enteritis, hydatidosis, coccidiosis, ectoparasitism, theileriosis and babesiosis are the major parasitic problems of ruminants in Pakistan in the order of priority [5]. There are a number of factors that influence the prevalence of helminths. These include age [6], sex [7], breed [8, 9], worm population [10], weather condition [7,11] and husbandry or management practices [12].

Some helminths infecting buffaloes primarily are also transmissible (directly or indirectly) to humans where they can cause significant clinical disease, such as schistosomiasis, cycstic echinococcosis, and fasciolosis [3, 13]. Considering the health implications and the economic potential of water buffaloes (Bubalus bubalis), the issue of investigating parasitic infections in buffaloes is of considerable relevance [14, 15].

MATERIAL AND METHODS

The present study was conducted from January to June 2009 to determine the point prevalence of gastrointestinal helminthiasis in the buffalo under field conditions at the vicinity of Tehsil Muzaffar Garh of District Muzaffar Garh, Southern Punjab, Pakistan.

Study area

From January to June 2009, faecal samples of total 500 buffaloes were brought to District Diagnostic Lab. Muzaffargarh for analyses. District Muzaffar Garh, positioned between latitude 288570 to 308460 N and longitude 708300 to 718470 E, having an area of 8249 km^2 which lies in the form of strip between the rivers Chenab and Indus, which pass along the eastern and western boundaries, respectively, of the district and form a triangle at Alipur tehsil of the district.

Sample collection

One thousand faecal samples of buffaloes were randomly collected in sterile polythene bags directly from rectum of each animal [16]. These faecal samples were brought to District Diagnostic Laboratory Muzaffar Garh and Department of Pathobiology, Faculty of Veterinary Sciences, Bahauddin Zakariya University, Multan for identification of eggs/larvae or adult helminthes.

Sample analyses

Fecal samples were examined for helminthes eggs/larvae by using direct and indirect techniques [16] and for identification of certain nematodes, copro-culture were performed to obtain larval stage. Both eggs and larvae from copro-culture were identified by using standard techniques as described by MAFF [32] and Soulsby, E. J. L [37]. Briefly, one gram of fecal sample was mixed well in a drop of water and a relatively homogenous and transparent preparation was obtained and examined under microscope by placing a drop of suspension on slide with cover slip. At least three direct smears were examined from each sample. All the samples were also examined by concentration techniques, i.e. floatation and sedimentation.

For floatation technique, five grams of feces was mixed in 30-50 ml of water and strained through a sieve to remove the course material. The mixture was allowed to sediment for half an hour. The supernatant was poured off and sediment was mixed in a saturated solution of common salt. The suspension was centrifuged at 1000 rpm for two minutes. The upper 0.1 ml of centrifuged suspension was transferred to a glass slide and examined under microscope at 10 X for the presence of helminthes eggs. More over a relatively new

technique for "a single slide positive sample" was developed as micro-floatation technique [16].

For sedimentation technique, five grams of faeces was mixed in 30-50 ml of water and strained through a sieve to remove the course material. The mixture was allowed to sediment for half an hour. After centrifugation, the supernatant was decanted and washing was continued until supernatant became clear. A drop was taken from sediment with Pasteur's pipette on slide and was examined under microscope at 10 X for the presence of helminthes eggs.

Copro-culture

Fecal cultures provide an environment suitable for hatching and development of helminthes eggs**.** Feces found positive for nematode eggs but confusing for exact identification were broken up finely, using either a large pestle and mortar or spatula and were placed in a glass jar or petri-dish which was closed and incubated at a temperature of about 26°C for 7 days. After incubation, samples were examined for the presence of larvae. Larvae were identified with the help of keys given by [32].

Statistical analyses

Data on the prevalence of helminthiasis was analyzed using Chi-square statistical design on the basis of sex and age. Graphical representation of data was also done.

RESULTS

The present study was undertaken from January to June 2009 to determine the prevalence of gastrointestinal helminthes in buffaloes. Overall Age wise and sex wise prevalence was 60% and 57.8%, respectively in buffalo. The highest prevalence (119/500; 23.2%) was recorded for nematodes followed by trematodes (117/500; 23.4%) and mixed helminthes infections (52/500; 12.4%). A total of seven species of helminths including five nematodes, i.e. *Toxocara vitulorum, Oesophagostomum radiatum, Bunostomum phlebotomum, Cooperia* spp., *Trichostrongylus* spp.; two trematodes, i.e. *Fasciola hepatica, Paramphistomum cervi* were recorded. The prevalence of different species of helminthes was as; *Toxocara vitulorum* was the most prevalent species of helminthes followed by *Paramphistomum cervi, Fasciola hepatica, Oesophagostomum radiatum, Bunostomum phlebotomum, Cooperia* spp and *Trichostrongylus* species. The mixed helminthes infections (52/500; 12.4%) was often composed of 07 species including *Toxocara vitulorum, Oesophagostomum radiatum, Bunostomum phlebotomum, Cooperia* spp., *Trichostrongylus* spp., *Fasciola hepatica* and *Paramphistomum cervi* were recorded.

Table I. Prevalence of different species of helminths in buffaloes

Species of helminth	Number of Faceal Samples Examined	Number of Faecal Samples Positive	Per cent Infected %age
Toxocara vitulorum	500	83	16.6
Paramphistomum cervi	500	75	15
Fasciola hepatica	500	42	8.4
Oesophagostomum radiatum	500	16	3.2
Bunostomum phlebotomum	500	8	1.6
Cooperia spp.	500	8	1.6
Trichostrongylus spp.	500	4	0.8

The prevalence of helminthes was higher in buffalo (Table-II) calves as compared to adult buffalo. A total of 12.4% buffalo (62/500) had mixed infection comprising 16% (32/200) in calves and 10% (30/3000) in adult buffalo.

Table II. Age-wise prevalence of different species of helminths in buffaloes in Tehsil Muzaffar Garh, District Muzaffar Garh

Species of helminth	**Calf**	**Adult**
Toxocara vitulorum	60/200; 30%	23/300; 7.67%
Paramphistomum cervi	40/200; 20%	35/300;11.67%
Fasciola hepatica	16/200; 8%	28/300; 9.33%
Oesophagostomum radiatum	4/200; 2%	12/300; 4.00%
Bunostomum phlebotomum	4/50; 2%	4/300; 1.33%
Cooperia spp.	2/200; 1%	6/300; 2.00%
Trichostrongylus spp.	1/200; 0.5%	3/300; 1.00%
Mixed infection	32/200; 16%	30/300; 10.00%
Overall prevalence	159/200; 79.5%	141/300; 47.00%

Table III. Sex-wise prevalence of different species of helminths in buffaloes in Tehsil Muzaffar Garh, District Muzaffar Garh

Species of helminth	Male	Female
Toxocara vitulorum	25/125; 20%	58/375; 15.47
Paramphistomum cervi	30/125; 24%	45/375; 12
Fasciola hepatica	13/125; 10.4%	29/375; 7.73%
Oesophagostomum radiatum	8/125; 6.4%	8/375; 2.13%
Bunostomum phlebotomum	5/125; 4%	3/375; 0.8%
Cooperia spp.	2/50; 1.6%	6/375; 1.6%
Trichostrongylus spp.	0/125; 0%	4/375; 1.07%
Mixed infection	15/125; 12%	38/375; 10.13%
Overall prevalence	98/125; 78.4%	191/375; 50.93%

In Table II and III,The prevalence of helminthes was higher in young animals compared with the older ones and the prevalence of helminthes was higher in males compared with the females.

Table IV. Prevalence of different species of helminths in animals in Tehsil Muzaffar Garh, District Muzaffar Garh

Species of helminthes	Buffaloes
Nematodes	
Toxocara vitulorum	+
Oesophagostomum radiatum	+
Bunostomum phlebotomum	+
Cooperia spp.	+
Trichostrongylus spp.	+
Trematodes	
Fasciola hepatica	+
Paramphistomum cervi	+
Cestodes	-
Total Number of Helminths Spp.	7

In Table IV, a total of seven species of helminthes (five nematodes and two trematodes) were recorded.

Table V. Age-wise and sex-wise prevalence of different species of helminths in buffalo in Tehsil Muzaffar Garh, District Muzaffar Garh

Species of animal	Calf	Adult	Overall prevalence
Buffaloes	159/200; 79.5%	141/300; 47.00%	300/500;60%
Species of animal	**Male**	**Female**	**Overall prevalence**
Buffaloes	98/125; 78.4%	191/375; 50.93%	289/500; 57.8

In Table V, The prevalence of helminthes was higher in young animals/ calves (79.5%) compared with the older ones (47%) while sex-wise the prevalence of helminthes was higher in males (78.4%) as compared with the females (50.93%).

DISCUSSION

Helminthiasis is one of the major problems which affect the productivity of buffaloes. Losses caused by helminthes invariably depend on the prevalence, nature and intensity of infection and the management practices. In this investigation, the prevalence of helminthes was higher in young animals compared with the older ones, and higher in males compared with the females in this study. In buffaloes, a total of seven species of helminthes including five nematodes, i.e. i.e. *Toxocara vitulorum, Oesophagostomum radiatum, Bunostomum phlebotomum, Cooperia* spp., *Trichostrongylus* spp.; two trematodes, i.e. *Fasciola hepatica, Paramphistomum cervi* were recorded. The most prevalent nematode recovered in this study from buffaloes were *T. vitulorum. T. vitulorum* was also reported to be the most frequently occurring nematode in cattle and buffaloes [18, 25, 26, 33, 34].

The higher infection in young animals than that in older ones may be attributed to lesser resistance because of lesser exposure to different species of helminthes compared with the older animals. It was, however, interesting to note that prevalence was higher in males compared with females. Normally, females are assumed to be more infected due to stress of pregnancy and parturition. This may be due to the practice of stall feeding females around pregnancy and thus lesser exposure to pasture contamination. Most of the researchers have observed higher rates of nematode infection/worm burden in female hosts compared with the males [7, 17, 18, 19, 20, 21]. Higher prevalence of nematode parasites in females compared with males may be because of lowered resistance of female animals due to their reproductive events and insufficient/unbalanced diet against higher needs. In contrast to the current results, [27] Gullrand 1992 reported that prevalence and intensity of infection (faecal egg counts) were higher in males than females, except during the lambing periods, and decreased with age in both sexes. Effect of reproductive cycle has been reported to affect the worm burdens in animals, which has an important epidemiological significance. For example, Lyons *et al.* (1987, 1992) and reported a progressive increase in the egg per gram and

number of helminths in ewes during and after the parturition period. This phenomenon has been attributed to a variety of reasons like seasonal changes, host factors, activation of hypobiotic larvae, parturition stress, poor nutritional status, peri-parturient relaxation in immunity (PPRI), hormonal changes around parturition, breed differences etc. etc. In many parts of the world, parturition of grazing animals is synchronized to occur with the climate favorable to pasture growth and also suitable for development and survival of free-living stages of most helminths [22].

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