A Survey on Prevalence of Gastrointestinal Parasitic Infection in Cattle of Sylhet Division in Bangladesh

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ABSTRACT

A survey was conducted to determine the prevalence of gastrointestinal parasitism in crossbred and local cattle, Sylhet division, Bangladesh. Fecal samples were collected randomly from 288 local and 144 crossbred cattle of four representative areas in three following seasons. The effects of season and age were tested in both local and crossbred cattle. Frequency of trematodes and nematodes infections was constant in all the survey areas. Incident of gastrointestinal parasitic infections was more frequent in rainy season followed by summer and winter. Significantly higher prevalence of Paramphistomum spp (20.53%) was found in rainy season whereas Haemonchus spp (5.46%) and Moniezia spp (4.18%) were higher in summer (P<0.05). Paramphistomum spp infections were more recurrent in adult while *Toxocara* spp were largest in calf (P<0.05). Prevalence of Haemonchus spp (4.56%) infections was significantly higher in local adult cattle where as *Trichostrongylus* spp (4.41%) infections were largest in local young cattle (P<0.05). It could be stated that season, age were the significant forecaster of gastrointestinal parasitism. It is highest during rainy season followed by cool, cold and hot season.

Keywords: Cattle, Parasitism, Prevalence ages, Seasons.

INTRODUCTION

The infection with various types of gastro- intestinal parasites in cattle is a worldwide problem^{3,4}. Gastrointestinal (GI) parasitic infections may be considered as one of the major constraints in cattle production. The infection causes productivity losses through reduced feed intake and decreased efficiency in feed utilization due to subclinical or chronic infections that are responsible for economic losses¹⁷. Livestock is an important constituent of the mixed farming system practiced in Bangladesh. Cattle rearing in Bangladesh being popular by days because these species are valuable for economic, managerial and biological reasons. Among the multitude of problems hindering the cattle development in Bangladesh, disease problems specially related to parasitism constitute a serious threat. Despite the special emphasis on the rearing ruminants, the development of the industry in Bangladesh is seriously threatened. Gastrointestinal parasitism is a world-wide problem¹⁶. It is thought to be one of the major constraints that hinder the development of livestock population¹⁰ and also adversely affects the health and productivity of animals¹³. The losses caused by parasitic infections are in the form of lowered general health condition, retarded growth rate, diminishing the working efficiency, decrease milk and meat production, abortion, cost associated with preventive measures and reduces the disease resistance capability, which may ultimately lead to higher mortality^{22,13}. On the other hand, the adult cattle are also severely affected by parasitism as they are kept for a longer period of time in breeding or milk production purposes and often supply insufficient feed against their high demand¹⁹ enormous economic resulting losses. Despite significant losses by gastrointestinal

parasitism, the problems are often neglected and overlooked as majority of the infected animals show a number of little obvious clinical signs during their productive life and their effects are gradual and chronic¹⁵. Hence, the present study was undertaken to investigate the prevalence of gastrointestinal parasitism of cattle considering breed, age, seasons at four different areas of Sylhet division. The current investigation will give an overall idea about the distribution of gastrointestinal parasitic infection in the region which will ultimately assist the clinicians forecasting and conscious the farmers to take appropriate control measures against parasitism.

MATERIALS AND METHODS

Survey map

The survey was conducted in four different topographic areas. namely Bianibazar (plane land), Biswonath (plane land), Sylhet sadar (Semi hilly), and Srimangol (hilly area) of Sylhet division in Bangladesh. Holstein Friesian (HF) crossbred (Bos taurus X Bos indicus) and local cattle (Bos indicus) were selected for this survey as objective animals. Selected animals were categorized into three age groups: calves ≤ 1 year, young >1-2.5 years and adult ≥ 2.5 years for HF crossbred and for local cattle age limit differed for young >1-3.5 years and adult \geq 3.5 year's cattle only²⁰. In each season, 96 Holstein Friesian cattle were considered where 40 adult, 21 young and 35 calves were taken from different dairy farms of Beanibazar area. On the other hand, 48 local cattle were taken in each season from household cattle where 16 animals from each mentioned area including 4 from each age group. Samples were collected randomly in three consecutive seasons; summer (March to May), rainy

(June to August) and winter (November to January).

Sample collection

Fresh fecal samples 10gm from each animal were collected directly from rectum and stored in plastic pot. The pot was then filled with 10% formalin after leveling with identification number. The collected samples were carried to the Upazilla livestock hospital, Biswonath where the samples were preserved in refrigerator at 4° C. Three different types of qualitative tests, like direct smear, flotation and sedimentation techniques were used to examine the fecal samples⁸. Sugar salt solution was used as flotation fluid.

Statistical analysis

Obtained data were analyzed by using statistical software 'STATA/IC-11.0'. Chi-Square Test were performed and the result were expressed in percentage with P-value and significance was determined when P<0.05.

RESULT

See table 1 and 2.

DISCUSSION

Seasonal prevalence

It was manifest that climate play key role in the transmission of parasitic infections¹¹. In this survey, prevalence of parasitic infections were more in rainy season (Table 1) which was in agreement with the reports of^{θ ,5}. It might be due to adequate moisture and optimum temperature which favoured the growth and survival of infective stages in the pasture^{21,16}. On the other hand, subsequent occurrence of gastrointestinal parasitic infections were observed in winter followed by summer season which showed consistency with the observation of^{21,5}. It

might be due to hot humid climate in summer and low temperature in winter season provides unfavourable environment for the survival and development of parasitic larvae¹² which decreased the availability of infective larvae in the pasture¹¹. In all three seasons of this study, gastrointestinal parasitic infections were more prevalent in local than crossbred cattle which might be due to communal grazing by local cattle and never use of anthelmintics. On the other hand, improved husbandry measures along with irregular anthelmintic or sometimes strategic anthelmintic therapy contributed less parasitic infection in crossbred cattle. Paramphistomum spp infection showed significant (P<0.05) seasonal variation in rainy season which was supported by the reports of 9,5 . On the other hand, higher prevalence of Schistosoma spp, Fasciola spp and Toxocara spp infections in rainy season in both local and crossbred cattle might be due to the rainfall and temperature which favours the growth and development of infective stages leading to more contamination of the pasture or feed¹³ In the study population, significantly (P<0.05) higher prevalence of Haemonchus spp infection in summer in local cattle were found in line with the reports of 12,24 who reported that relatively high temperature and humidity in the microclimate required for the larval development and survival.

Age precise prevalence

Age specific prevalence of parasitic infections especially, *Paramphistomum* spp, *Schistosoma* spp, *Haemonchus* spp and *Fasciola* spp were found more in adult cattle which supported the observation of¹⁹ who reported that *Fasciola, Paramphistomum*, *Schistosoma* and *Trichuris* were highest in the age group greater than 36 months and lowest in age group less than 12 months. Findings of⁶ also supported the findings of this study. The earlier findings of this investigation showed disagreement with^{14,16} who recorded

significantly higher worm burden in younger animals than adult. Higher prevalence of parasitic infection in adult cattle might be due to keeping them for a longer period of time in breeding and milk production purposes or supply inadequate feed against their high demand¹⁹. Moreover, stress like lactation, pregnancy, nutritional deficiency which might be accounted for higher prevalence in adult cattle¹³. On the other hand, the highest prevalence of Toxocara spp infection in calf was supported by the reports of 19,2 who recorded such infection in early months of life. Toxocara spp infection in local calf of this study partially supported the findings of¹ who recorded higher prevalence at 0-12 month of age. Higher prevalence of such infection might be due to prenatal infection through transfer of 3rd larval stage (L_3) and post-natal infection by poor hygienic condition^{24,23} stress, genetic resistance of host and insufficient feed supply against their higher needs 15,7 .

CONCLUSION

The explored data of this survey will furnish an overall idea about the distribution of gastrointestinal parasitic infections along with the study areas. Yet, this survey will construct the approach to take further widespread study related to these infections which will help to take obligatory preventive and control measures against parasitism.

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	Local Cattle				Crossbreed cattle			
Parasites	Summer n=48	Rainy n=48	Winter n=48	P value	Summer n=96	Rainy n=96	Winter n=96	P value
Fasciola spp	2.07	3.48	2.08	0.67	0.02	2.78	0.01	0.13
Haemonchus spp	5.46	1.19	0.06	0.005	2.78	0.02	1.39	0.36
Paramphistomum spp	10.43	20.53	8.34	0.054	14.28	13.8	9.0	14.28
Schistosoma spp	4.19	11.11	6.97	0.078	2.72	0.45	6.96	6.91
Moniezia spp	4.21	0.69	0.01	0.018	1.39	1.39	0.0	0.60
Toxocara spp	6.94	8.34	6.25	0.78	5.56	6.94	4.17	0.67
Oesophagostomum spp	2.08	1.39	1.39	0.86	1.39	4.17	1.39	0.44
Trichostrongylus spp	0.68	4.66	1.29	0.03	1.19	2.38	4.44	0.42

Table 1. Seasonal prevalence of gastrointestinal parasitism

	Local cattle				Crossbred cattle			
Parasites	Calf (n=48)%	Young (n=48)%	Adult (n=48)%	P value	Calf (n=96)%	Young (n=96)%	Adult (n=96)%	P value
Fasciola spp	0.73	0.01	0.0	0.0	0.0	0.4	3.21	0.35
Haemonchus spp	0.0	2.08	4.56	0.0023	0.0	0.0	3.33	0.11
Paramphistomum spp	6.84	4.56	4.56	4.56 [*]	4.66	19.05	22.12	0.005
Schistosoma spp	5.56	2.39	2.39	2.39	2.39	7.14	7.78	0.26
Moniezia spp	0.69	0.0	0.0	0.0	0.1	2.38	1.11	0.40
<i>Toxocara</i> spp	17.44	1.09	0.29	0.00*	14.09	0.5	1.12	0.002
Oesophagostomum spp	0.3	1.19	1.19	1.19	1.19	4.76	2.22	0.45
Trichostrongylus spp	0.69	4.41	1.39	0.03*	1.19	2.38	4.44	0.42

 Table 2. Age specific prevalence of gastrointestinal parasitism