

EPIDEMIOLOGICAL INVESTIGATION OF PARAMPHISTOMIASIS IN CATTLE AT KOTALIPARA UPAZILA OF GOPALGANJ DISTRICT

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ABSTRACT

The aim of the study was to investigate the Epidemiology of *Paramphistomum* infection in cattle. A total of 330 fecal samples from 113 bulls and 217 cows were collected from different areas of Kotalipara upazila from March 2021 to February, 2022. Fecal samples were collected directly from the rectum of the cattle or immediately after defecation or from the ground when the animals were found in the act of defecation. About 15-25 grams of feces were collected from the animals. Each fecal sample were transferred to a jar containing 10% formalin and labeled properly as per age, sex and breed of the animals. The samples were examined under microscope on the day of collection at BAPARD Laboratory. Out of 330 samples examined, 175 (53.03%) were found infected with *Paramphistomum spp.* During the study period examined animals were categorized into three age groups viz 104,100 and 126 cattle for Growing animals (6 months- 2 years); Young animals (> 2- 5 years); older animals (> 5 years), respectively. Older animals suffered (59.52%) more than growing (44.23%) and young (54.0%) ones. Older animals were 1.35 times more susceptible than growing animals. Furthermore, females were more (58.06%; 1.34 times) susceptible to *Paramphistomum spp.* than males (43.36%). The prevalence of Paramphistomiasis was higher in crossbred (61.9%) animals than that of local (48.89%) cattle. The crossbred cattle were 1.27 times more susceptible than indigenous cattle. The prevalence of Paramphistomiasis in cattle varied depending on the season of the year; being highest in the rainy season (60.91%) followed by the summer (50%) and lowest during the winter (48.18%). A high percentage of paramphistomiasis was recorded in the cattle, grazed on pasture land (63.08%) than of stall feeding (46.5%). The study indicate high percentage of infection found during the winter irrespective of age and genetics of animals and seasons of the year.

KEYWORDS: Cattle breeds, Paramphistomiasis, Prevalence, BAPARD.

INTRODUCTION

Livestock is an important sub-sector considered to be the backbone of agriculture. Parasitism is one of the most vulnerable causes of livestock diseases which are the major obstacle in the growth and development of animal health Mahfooz *et al.* (2008). Parasitism is one of the main causes limiting livestock productions in most of the tropical and sub-tropical countries of the world. In Bangladesh, parasitism has been considered as one of the major constraints of livestock production (Jabbar & Hag, 1983). The incidence of parasitic diseases in the domestic ruminants of Bangladesh is also high and as a result hardly any livestock industry could develop here. In Bangladesh, there are many constrains in cattle production, among them malnutrition and parasitism are the major limiting factors (Jabbar and Green, 1983). The losses due to parasitism take in the form of mortality, lower general health condition, retarded growth, decrease in the production of milk and meat and lower output of work (Faiz, 1972). The geo-climatic conditions together

with the water-logged and low-lying areas in Bangladesh are conducive to parasitic diseases in domestic ruminants. Helminthiasis has long been recognized and still are problems resulting in losses in ruminant production in almost all regions of the world including Bangladesh Alawa *et al.* (2010). Infact, cattle of Bangladesh are affected by various types of helminth parasites (Rahman and Razzak, 1973; Rahaman and Mondal, 1983). Experts from both government and non-government organization in Bangladesh believe that parasitic diseases are of enormous economic importance (Islam, 1985). In ruminants, paramphistomiasis is often associated with diarrhea, loss of body condition, rough hair coat, dullness, weakness, loss of appetite, intestinal haemorrhages, anemia, reduced milk production and intermandibular swelling (Chandrasekharan *et al.*, 1982). The flukes is widespread in Bangladesh (Hosain and Baki, 1987; Rabbani, 1992; Saifuzzaman, 1996). Afazuddin (1985) estimated an annual economic loss of about 1400\$ due to various parasitic diseases in cattle in

military farm, Savar, Dhaka. The paramphistomum is normally present in cattle gastro-intestinal tract but over loading has an adverse effect. However, the epidemiological study of Paramphistomiasis has not yet been investigated properly in cattle at Kotalipara upzilla of Gopalganj district in Bangladesh. The aim of present investigation was to study the prevalence of Paramphistomiasis in cattle at Kotalipara upzilla of Gopalganj district.

MATERIALS AND METHODS

Study area and Duration

This study was conducted during the period March, 2021 to February, 2022. A total no. of 330 samples were collected from different Beneficiaries of 12 union of Kotalipara upzilla on random basis. The samples were examined at BAPARD Parasitology Laboratory on the day of collection. Epidemiological data were collected from the owners by cross-questioning and clinical data were recorded after physical and clinical examinations. Morphological examination of eggs was conducted in BAPARD Parasitology Lab. Cattle at 6 months or older ages were selected. The age of the animal were determined by observing teeth eruption and taking history from owner. During collection of samples data on the age, sex, breed, place of farming and season of the year carefully recorded by interrogating the farmers. The cattle were grouped into three groups: Growing animals (6 months- 2 years); Young animals (> 2- 5 years); older animals (> 5 years). Faecal samples were in every season summer (March to June), rainy (July to October) and winter (November to February) from different villages of the Kotalipara upzilla. Faecal sample was collected from suspected cattle for confirmatory diagnosis by coprological examination.

Coprological Examination

A total of 330 numbers of cases of cattle were recorded randomly during the study period. Fecal samples were collected directly from the rectum of the cattle or immediately after defecation or from the ground when the animals were found in the act of defecation. About 15-25 grams of feces were collected from the animals. . Each fecal sample were transferred to a jar containing 10% formalin and labeled properly as per age, sex and breed of the animals. The fecal sample was examined using standard direct smear method of fecal sample examination described by Soulsby (1982).

Table 1: Overall prevalence of Paramphistomiasis in cattle.

Total No. of Sample	Positive	Prevalence
330	175	53.03%

Effects of breed on paramphistomiasis

The prevalence of Paramphistomiasis was higher in crossbred cattle (61.9%) than that in indigenous cattle (48.89%) (Table 2). Thus effect of Breed for paramphistomiasis was very similar with Paul *et al.* (2011). The higher prevalence of Paramphistomiasis in

Technique of total egg count per gram of feces (EPG) (Solusby 1982)

The fecal sample was first well mixed and then 3 gm were weighed and put in 100 ml beaker containing 45 ml of water. Some glass beads were added. The feces were thoroughly mixed with a magnetic stirrer. The mixture was strained through a coffee strainer. The strained mixture was again shaken and 0.15 ml of the mixture was taken with a 1ml syringe and put on a slide and covered with a cover slip. The slide was then placed under a microscope and the *Paramphistomum* eggs were identified on the basis of their characteristics morphological features as described by Soulsby (1982) and then counted. The counted total number of eggs found in one slide was multiplied by 100 to get the EPG. (Egg per gram feces).

Data analysis

All the data were processed, summarized and prevalence percentage was calculated by Microsoft office- 2007 Program. A descriptive analysis was performed to interpret the data.

RESULTS AND DISCUSSION

Prevalence of Paramphistomosis

The overall prevalence of Paramphistomiasis in cattle of the Kotalipara upzila of Gopalganj district with regards to age, sex, and breed of animals and feeding system in three seasons are shown in the Table 1. The present investigation revealed a high percentage of Paramphistomiasis (53.03% in faecal sample) in cattle. However, faecal examination of cattle and buffaloes from some limited areas of Bangladesh have also suggested that the prevalence of Paramphistomiasis is very much common in Bangladesh. (Afazuddin, 1985; Rahman and Mondal, 1983; Rabbani, 1992 and Saifuzzaman, 1996). This study strongly support the prevalence (53.1%) of paramphistomiasis at selected area of Sirajgonj district (paul *et al.* 2011). The overall Prevelence of Paramphistomiasis recorded in cattle was very similar with, Saifuzzaman (1996), 52.2%; Sahay *et al.* (1989), 58.3% and slightly lower than the reports of Rahman & Razzak (1973), 62.6%; and higher than the reports of Rahman and Mondal (1983), 21.6%; Islam & Samad (1989), 46.3%. This variation in the prevalence of Paramphistomiasis in cattle may be due to agro ecological conditions, animal husbandry practices and breeds of animal.

crossbred cattle may be due to their lower resistance to tropical diseases than indigenous animals.

Table 2: Breed related prevalence of Paramphistomiasis in cattle.

Breed	No. of Sample	Positive case	Prevalence (%)
Cross Breed	105	65	61.9%
Indigenous	225	110	48.89%

Effects of age of the cattle on paramphistomiasis

The prevalence of Paramphistomiasis varried depending on their age in cattle (Fig. 1). Highest rate of infection was found in the older cattle (59.52%). The lower rate of infection was found in the young animals (54.0%) and the lowest rate of infection was recorded in the growing calves (44.23%). This result is in agreement with the earlier findings of paul *et al.* (2011) and Okafor *et al.*

(1988) who reported that there was an age limit in the prevalence of Paramphistomiasis. They also reported that heavy infection was found in cattle more than five years of age. The reason for this variation in the prevalence of infection in different age groups in cattle is difficult to explain but it might be due to an age related variation in resistance to disease and grazing habit (Okafor *et al.*, 1988).

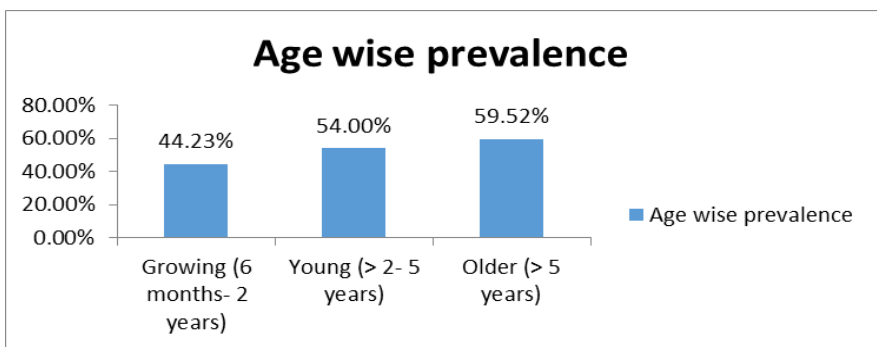


Fig: 1 Age related prevalence of Paramphistomiasis in cattle.

Sex related prevalence rate: The prevalence of Paramphistomiasis in female animals was 58.06% and in male animals was 43.36% (Table 3). Saifuzzaman (1996) reported that the percentage of paraphistomum infection in male and female cattle was 45.5% and 55.6%, respectively. Paul *et al.* (2011) also reported that the percentage of paraphistomum infection in male and

female cattle was 45% and 59.5%, respectively. The higher percentage of infection in the females may be due to the alteration in the physiological condition of the animals during pregnancy and lactation (production activity) and also the lack of feed supplement for production, which may lead to the lowering of body resistance of the females.

Table 3: Sex related prevalence of Paramphistomiasis in cattle.

Sex	No. of Sample	Positive	Prevalence
Male	113	49	43.36%
Female	217	126	58.06%

Seasonal effect on prevalence of paraphistomiasis in cattle: The prevalence of pramamphistome infection in cattle during the rainy, winter and summer seasons were 60.91%, 48.18% and 50%, respectively (Fig. 2). This result is closely related to the reports of Paul *et al.* (2011); Petkov *et al.* (1988); Dakshinker and Sandy (1982) and Okafor *et al.* (1988). However, Manna *et al.*

(1994) reported that the highest incidence of Paramphistomiasis was in the summer season. This variation might be due to different climatic factors such as temperature, rainfall and humidity which influence the availability of intermediate host, other agro- climatic condition and ecology of the vector and host.

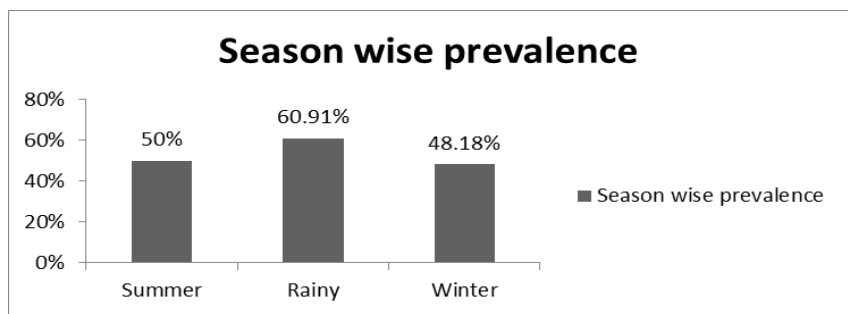


Fig 2: Season wise prevalence of Paramphistomiasis in cattle.

Feeding habit related prevalence of paramphistomiasis in cattle: The prevalence of Paramphistomiasis was higher in grazing cattle (62.5%) than that of stallfed cattle (46.5%); (Table 4). In another study of Paul *et al.* (2011) indicates stall feeding cattle

show lower infection (45.5%) to paramphistomiasis than Grazing one (62.5%). The higher percentage of infection in the Grazing cattle due to pasture on low land area and snail affected grass.

Table 4: Feeding habit related prevalence of Paramphistomiasis in cattle.

Feeding Management	No. of Sample	Positive case	Prevalence
Grazing	130	82	63.08%
Stall Feeding	200	93	46.5%

CONCLUSION

This study showed that the prevalence of *Paramphistomum Spp.* in cattle is common in Kotalipara upazila of Gopalganj district in Bangladesh. Female, crossbred and older cattle were more susceptible to paramphistomum infection. From our clinical and field experiment it is observed that the disease is diagnosed throughout the year, but its prevalence is more in rainy season than that of other seasons. Further study should be needed to develop an effective control strategy based on findings of this study to protect the domesticated animals from the harmful effects of paramphistomiasis infection in this area.

REFERENCES

- Alawa CBI, Adamu AM, Gefu JO, Ajanusi OJ, Abdu PA and Chiezey NP (2010) *In vivo* efficacy of *Vernonia amygdalina* (compositae) against natural helminth infection in Bunaji (*Bos indicus*) calves. *Pakistan Veterinary Journal*, 30: 215-218.
- Afazuddin, M. 1985. General incidence and therapeutic measures of parasitic diseases in cattle of saver Military Dairy Farm. M. S. Thesis. Submitted to the Department of Medicine, Bangladesh Agricultural University, Mymensingh.
- Chandrasekharan, K. Radhakrishnan, K. Jacob, V. and Cheeran, 1982. Efficacy of Distodin in the treatment of amphistomiasis in Indian elephants. *Kerala Journal of Veterinary Science*, 13: 55-58.
- Dakshinker, N.P, and Sandy, M.R. 1982. Incidence of helminth in ruminants of Nasgpur region. *Livestock adviser*, 7: 49-50.
- Faiz, M.A. 1972. Report on "Investigation in to the epidemiology of parasitic disease in East Pakistan". In: Activities on the Research sections of Directorate of Livestock Services Bangladesh.
- Hosain, M.I. and Baki, M.A. 1987: Pathological studies on intestinal amphistomiasis in buffaloes. *The Bangladesh Veterinarian*, 4: 29-33.
- Islam, K.S.1985. Present situation of livestock and poultry diseases in Bangladesh. In: Jabbar MA (ed) Bangladesh poshusampad unnayun-Neeti O Kowshal BARC, Dhaka and ADC NY., 84-128.
- Jabber, M. and Green, D.A.G. 1983. The status and potential of livestock within the context of agricultural development policy in Bangladesh. The University of wales. Aberystwyth, United Kingdom, 113.
- Manna, A.K. Pramanik, S. and Mukherjee, G.S. 1994. Incidence of paramphistomiasis in west Bengal. *Indian Journal of Animal Health*, 33: 87-89.
- Mostafa, M.G. 1989. *Methods of statistics*, Karim press and Publication, Dhaka, Bangladesh.
- Mahfooz A, Masood MZ, Yousaf A, Akhtar N and Zafar MA (2008) Prevalence and anthelmintic efficacy of Abamectin against gastrointestinal parasites in horses. *Pakistan Veterinary Journal*, 28: 76-78.
- Okafor, F.C. Mbata, G. and Anosike, J. 1988. Studies on *Patamphistomum cervi* (Schrank, 1790) infection of ruminants in Imo state, Nigeria with special reference to the role played by *Bulinus b. forskalii* (Ehrenberg) in their transmission. *Bulletin of Animal Health and Production in Africa*, 38: 142-146.
- Paul, A.K. Talukder, M. Begum, K. and Rahman M.A. 2011. Epidemiological investigation of Paramphistomiasis in cattle at Kotalipara upzilla of Gopalganj district. *Journal of Bangladesh Agricultural University*, 9(2): 229-232.
- Petkov, A. Rusev, I. Ignafov, G. Toncheva, V. and Mikhailov, Z. 1988. Epidemiological control, early chemoprophylaxis and treatment of ovine fascioliasis *Veterinarnal Sbirka*, 86: 42-44.
- Rabbani, S.M.B. 1992. Studies on the prevalence of Buffalo diseases. M S Thesis, submitted to the Department of pathology, Bangladesh Agricultural University, Mymensingh.
- Rahman, M.H. and Mandal, M.H. 1983. Helminths parasites of cattle (*Bos indicus*) in Bangladesh. *Indian Journal of Parasitology*, 7: 173-174.
- Rahman, M.H. and Razzak, A. 1973. Incidence of helminth parasited infecting cattle. Kotwali Thana of Comilla, First Bangladesh Veterinary Conference, Agricultural University Campus, Mymensingh, 25.
- Sahay, M.N. Sahai, B.N. Singh, S.K. 1989. Survey of paramphistome infection in bovine. Its seasonal and regional variations in the state of Bihar (India). *Indian Journal of Animal Health*, 28: 91-92.
- Saifuzzaman, A.B.M. 1996. Incidence and seasonal variation of helminth parasites of cattle of Chandina Thana in Comilla district. MS Thesis. Submitted to the Department of parasitology, Bangladesh Agricultural University, Mymensingh.
- Soulsby, E.J.L. 1982. Helminths, Arthropods and protozoa of Domesticated Animals. 7th edn. ELBS, Bailliere, Tendal, 70-71.