RESEARCH PAPER

Study on Prevalence of Bovine Fascioliasis at Mirzaganj Upazilla of Patuakhali District in Bangladesh

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ARTICLE HISTORY

ABSTRACT

A study was conducted during the period from October, 2016 to January, 2017 to determine the prevalence of bovine fascioliasis at Mirzaganj upazilla under the Patuakhali district in Bangladesh. A total no. of 92 bovine cases was recorded as study population for the present study. Tentative diagnosis of fascioliasis was made on the basis of history, clinical signs, physical examination findings; whereas confirmatory diagnosis was made on the basis of coprological examination. The overall prevalence of fascioliasis was 44.57%. The age of the study population (cattle) were divided into three groups i.e. ≥1-2 years; 2-4 years; 4-6 years and their prevalence (%) of fascioliasis were found 47.83%, 41.37% and 41.17% respectively. The higher prevalence of fascioliasis was recorded in female 52.83% followed by male 33.33%. Among the study population, the highest prevalence was recorded in cross breed (60%) cattle than local or indigenous (42.68%) cattle.

Key words: Age, breed, Fascioliasis, prevalence, sex.

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). 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). Fascioliasis is recognized as one of the most important helminth diseases of the domesticated ruminants Lessa *et al.* (2000). Fascioliasis is an economically important parasitic disease of herbivorous mammals caused by trematodes of the genus *Fasciola* that migrate in the hepatic parenchyma and establish in the bile ducts Troncy (1989). It is an emerging parasitic infection, having significant impacts on both veterinary and human health throughout the world Lazara *et al.* (2010). The development of fascioliasis involves the presence of an intermediate host (Lymnaea sp.), suitable habitats for mollusks and environmental factors such as high humidity, adequate temperature and rainfall. In livestock, fascioliasis is important for losses caused by either mortality in acute cases or weight loss, infertility and reduced production in chronic cases Siddiki *et al.* (2010).

Bangladesh has a tropical monsoon climate characterized by wide seasonal variations in rainfall, high temperatures, and humidity. The geo-climatic conditions of Bangladesh are highly favorable for the growth and multiplication of parasites. Due to the tropical climate, the causal agent *Fasciola gigantica* is prevalent in this part of the world (Amin & Samad 1988). The prevalence of fascioliasis may differ in cattle. Earlier reports suggest around 19-53% prevalence of fascioliasis in cattle in various districts of Bangladesh (Rahman & Mondal 1983); Chowdhury *et al.* (1994); Affroze *et al.* (2013). Considering the economic importance and pathological effects of liver fluke infection several researchers have emphasized and worked to quantify the prevalence and the economic losses in the various parts of Bangladesh (Rahman & Mondal 1983). Fascioliasis is an economically important parasitic disease as it causes huge economic losses in terms of reduction of milk and meat and high morbidity in all ages of animals Saleha (1991). Apart from the reductions in milk and meat yield, it also involved in losses due to decreased fertility Abunna *et al.* (2010). Considering all those fact, the objective of the present study was set to- detect the prevalence of fascioliasis in cattle at Mirzaganj upazilla under Patuakhali district in Bangladesh.

Materials and Methods

This study was conducted during the period 9th October, 2016 to 8th January, 2017 in the upazilla veterinary hospital Mirzaganj, Patuakhali. A total no. of 92 cattle was brought to upazilla veterinary hospital during the study period for treatment purposes. Those animals were considered for the present study as study population. Study population was divided into three age groups i.e. ≥1-2 years; 2-4 years; 4-6 years. Epidemiological data were collected from the owners by cross-questioning and clinical data were recorded after physical and clinical examinations.

History, Physical and Clinical Examination

History along with other necessary information's was taken from individual farmers by cross questioning. History included – Age, breed, clinical signs and location of cattle pen and previous history of fascioliasis. Physical examination was done for each cattle attending at the upazilla veterinary hospital, Mirzagonj, Patuakhali. Simultaneously faecal sample was collected from suspected cattle for confirmatory diagnosis by coprological examination.

Coprological Examination

A total of 92 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. The fecal sample was examined using standard direct smear method of fecal sample examination described by Soulsby (1982).

Diagnosis of Fascioliasis

Tentative diagnosis was made on the basis of history, physical and clinical signs (depression, dullness, in appetite, rough hair coat, diarrhea, emaciation, bottle Jaw appearance formation). Confirmatory diagnosis was made on the basis of coprological examination findings; *Fasciola* eggs were confirmed by the characteristics of oval shaped, eccentric morulla, operculum present, yellow brown in color. Presence of single eggs of *Fasciola sp. in one microscopic focus* during coprological examination was recorded as positive for fascioliasis.

Data analysis

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

Results and Discussion

A total 92 cases were recorded as infected case based on history physical and clinical examinations.

Overall Prevalence of Fascioliasis

The result of the present study revealed that the overall prevalence of fascioliasis was 44.57% (Table 1) the findings is supported by Yadav *et al.* (2015); Karim *et al.* (2015).

The result of the present study was similar to the study of Yadav *et al.* (2015) who reported overall prevalence

Table 1. Overall prevalence of fascioliasis in cattle

No. of cases recorded	*Fasciola* sp. positive cases	Prevalence (%)
92	41	44.57

of fascioliasis in cattle is 51.0%. Abraham *et al.* (2014), is stated that the prevalence of fascioliasis is 44.8%. Karim *et al.* (2015) also found the overall prevalence of fascioliasis is 66.14%. But Sumbal Haleem *et al.* (2016) reported the overall prevalence of fascioliasis in cow was 25%. Chakraborty and Prodhan (2015) found the prevalence of fascioliasis is 14.8%, those results disagree with the present study results. The variation with the findings of the present study was very high; it might be due to location, use of anthelmintic, session and duration of the study. Prevalence of fasciolosis in cattle is attributed by multi-factorial risk factors which comprise host, parasite and environmental effects. High-rainfall areas favour development and survival of both the intermediate host snail and the developmental stages of the parasite Affroze S. *et al.* (2013). This variation might be due to the variation on sample size and sampling, nutritional status, geographical location such as grazing on low lying areas is an important predisposing cause of Fasciola infestation Khatun *et al.* (2015); Tembely *et al.* (1995).

Clinical Fascioliasis Associated with Age

Study population of cattle was divided into three age groups i.e. ≥1-2 years, 2-4 years and 4-6 years. The highest prevalecne of clinical fascioliasis was observed in the cattle group ages between ≥1-2 years (47.83 %) followed by 2-4 years (41.37%) and 4-6 years (41.17 %) (Table 2).

Table No. 2. Age wise prevalence of clinical fascioliasis

Age group (year)	No. of cattle	No.of cattle affected	Prevalence (%)
≥1-2	46	22	47.83
2-4	29	12	41.37
4-6	17	07	41.17
Total	92	41	44.57

The findings of the present study was supported by a recent research work Nath *et al.* (2016). Nath *et al.* (2016) reported young (6 to 18 months) are more infected compared to adult animals. This might be due to adult are comparatively more resistant than the young to be infected with intestinal parasite. Sumbal Haleem *et al.* (2016) reported the prevalence of F. gigantica was 7.2% in adult cattle; where 3.9% in young. This finding was disagreed by the statement of Sarder *et al.* (2006); Khandaker *et al.* (1993) who reported that, the prevalence of *Fasciola gigantica* were highest in cattle of more than 36 months of age and lowest in the age of less than12 months. Karim *et al.* (2015) stated that bovine fasciolosis was significantly (p<0.01) higher in old cattle (76.43%) compared to adult (68.69%) and young (48.62%). Bhutto *et al.* (2012) is also reported that the highest level of infection was found in older

group i.e., above 6 years (62.62%) followed by in age groups of 4-6 years (57.28%), 2-4 years (42.56%) and up to 2 year (17.87%). The findings of the present study were varying from previous study findings. In present study young (≥1-2 years) cattle was found more susceptible to clinical fascioliasis, it might because calves and young cattle are frequently graze on the field so they have much more exposure on circulating circariae and metacercariae . Farmers are like to rear animal for fattening purposes and most of the cattle consider for beef fattening farm are in between ≥1-2 years of age, farmers used to bring their cattle in the hospital for treatment purposes at the very beginning of the fattening program. It is easier to transport younger animals than older. So most of the young cattle were expose to the veterinary hospital for treatment purposes. On the other hand this might be due to adult are comparatively more resistant than the young.

Clinical Fascioliasis associated with breed
The prevalence of fascioliasis between the local (Indigenous) and cross breeds were determined for this study (Fig. 01). The highest incidence was recorded in cross breed (60%) followed by indigenous cattle (42.68%). Cross breed cattle were highly susceptible than that of local cattle. Present findings are strongly fitted with the previous study of Khatun *et al.* (2015) and Hoque *et al.* (1998). Khatun *et al.* (2015) conducted a research in Chittagong district of Bangladesh and reported the occurrence of fascioliasis is higher in cross breed (64.29%) cattle than local (35.71%). Hoque *et al.* (1998) who reported that the mortality rate of cross breed calves is more than that of indigenous calves due to fascioliasis. Most of the farmers of our country cannot fulfill the nutrient requirements of cross breed animal due to lower resistance capacity to fascioliasis.
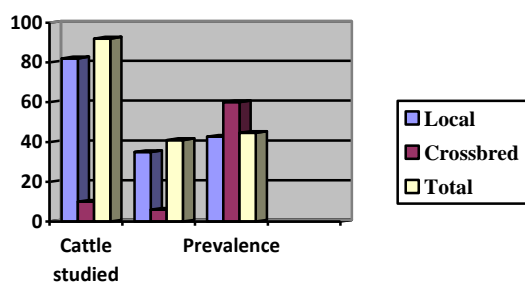

Figure 1. Breed wise prevalence of fascioliasis

Prevalence of Fascioliasis on the basis of Sex
In the present study, the prevalence of fascioliasis (Table 3) in female was higher (52.83%) than in males (33.33%) the findings is similar to the findings of Affroze S. *et al.* (2013)**;** Karim *et al.* (2015); Nath *et al.* (2016). This findings is supported by the findings of Affroze S. *et al.* (2013)**,** who reported that female cattle (41.36%) are highly susceptible than male (13.85%). Karim *et al.* (2015) reported that female cattle (70.3%) are highly susceptible than male (55.23%). Nath *et al.* (2016) reported infestation of fasciola sp is more in

Table No. 3. Sex wise prevalence of clinical fascioliasis in cattle

Sex group	No. of cattle handled	No.of cattle affected	Prevalence (%)
Male	39	13	33.33
Female	53	28	52.83
Total	92	41	44.57

female cattle (52.2%) than male (47.8%). Bhutto *et al.* (2012) reported incidence of fasciola in female (45.08%) as much as double in comparison of male (20.89%). But Sumbal Haleem *et al.* (2016) disagree with the present findings who reported male (14%) is highly susceptible than females (9.8%). Females cattle were more succeptible to fasciola infection than males, the exact cause of this is still beyond quentionable, but females are physically and immunologically weaker than male cattle probably make them more prone to fasciola infection Molina *et al.* (2005) and Chowdhury *et al.* (1994).

Conclusion
In conclusion bovine fasciolisosis is one of the major constrains for cattle development in Bangladesh. The geo-climatic conditions together with water-logged and low laying areas in Patuakhali district of Bangladesh are conductive to parasite in domestic ruminants. The hot and humid climates in fact make this country a paradise for parasitic animals. Epidemiological investigation of fascioliasis is considered as tools for controling bovine parasitic infection. In Bangladesh there is lack of epidemiological record regarding fascioliasis. Although the present study results have some limitation because low sample size, limited study area and duration of the study may lead improper diagnosis. Further epidemiological study is strongly recommended. Despite of all constrains the present study findings will help researchers for further epidemiological study of bovine fascioliasis.

Acknowledgement

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