



PREVALENCE OF FASCIOLIASIS IN CATTLE AT DINAJPUR DISTRICT OF BANGLADESH

A.A. Ali, M.H. Ali, M.G. Azam, M.M. Islam, and A.A. Omar

Department of Pathology and Parasitology, Hajee Mohammad Danesh Science and Technology University, Dinajpur-5200, Bangladesh

ABSTRACT

Fascioliasis is a common hindrance in livestock development in Bangladesh and the present research experiment was carried out to investigate the prevalence of fascioliasis in cattle at Dinajpur district of Bangladesh during July to December, 2018 using history, clinical signs, physical and coprological examinations. A total of 100 cattle (62 male and 38 female) were recorded as study population. Out of 100 cattle 17 cattle were found positive. All experimented animals were divided into three age groups such as young (6 month-1year), adult (1-2 years) and old (2- above years). The overall prevalence of fascioliasis was 17% among which the highest prevalence was recorded in older animals (24.14 %) followed by adults (8.7 %) and young (5.26 %), respectively. As per sex-based sectary, higher prevalence of fascioliasis was found in female (28.95 %) followed by male (9.68 %). The higher prevalence of fascioliasis was recorded in poor healthy (22.39 %) followed by healthy ones (6.06 %). This study was preliminary one considering small population of cattle.

Key words: Fascioliasis, Cattle, Prevalence, *Fasciola gigantica*

INTRODUCTION

Fascioliasis is recognized as one of the most important helminth diseases of the domesticated ruminants (Lessaet *al.* 2000). The disease is usually characterized by a chronic, sometimes acute or subacute inflammation of the liver and bile ducts, accompanied by submandibular oedema, anaemia, anorexia, general intoxication, and death (Ogunrinade and Ogunrinade 1980). Fasciolosis also known as fascioliasis, distomatosis and liver Rot is an important disease of cattle caused by trematodes *i.e.* *Fasciola hepatica* and *Fasciola gigantica* (common liver flukes). This condition of internal parasitism is one of the major problems that lower the livestock productivity throughout the world (Veracruz and Claerebont 2001). Fascioliasis, a serious infectious parasitic disease infecting domestic ruminants and humans, tops all the zoonotic helminthes worldwide (Haridy *et al.* 2002). The disease is predominantly caused by *F. hepatica* and/or *F. gigantica* (Soulsby 1965).

*Corresponding Author: Email: haydar.dvm03@gmail.com , Cell Phone: +8801737545098

J. Sci. Technol. (Dinajpur) 20 (June 2022): 1-8

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). Therefore the present study was conducted to observe the overall prevalence of fascioliasis in relation to age, sex and nutritional status.

MATERIALS AND METHODS

Study Area and Duration

This study was conducted at the Sadar Upazila of Dinajpur District during July to December 2018 and the experiment plan was prepared in the Department of Pathology and Parasitology, Hajee Mohammed Danesh Science and Technology University (HSTU), Dinajpur, Bangladesh.

Selection and grouping of animal

A total of 100 cattle were selected purposefully from Uttar Sadipur, Nandoir, Kornai, and Vatapara in Sadar Upazila of Dinajpur district of Bangladesh. Those animals were considered for the present study as study population. Study population was divided into three age groups i.e. young (6 month-1 year); adult (1-2 years); old (2- above years) on the basis of owner information and dental formula. Their sex was divided into (62 Male and 38 Female) and also their nutritional status was divided into healthy or poor healthy on the basis of body condition score (BCS), under BCS cachectic, poor and overweight considered as poor healthy, while medium and slightly fatty considered as healthy ones. Epidemiological data were recorded after history, physical, clinical and coprological examination.

RESULTS AND DISCUSSION

Overall prevalence of fascioliasis

A total number of 100 faecal samples were examined and out of 100 samples, 17 samples were positive. The result of the present study revealed that the overall prevalence of fascioliasis was 17%. (Table 1).

The overall prevalence of fascioliasis was 14.8% (Chakraborty and Prodhan 2015); the overall prevalence of fascioliasis in the Nile Delta region of Egypt was 9.77% (El-Tahawy *et al.* 2017); the overall prevalence of fascioliasis in cow was 25% (Haleem *et al.* 2016); the overall prevalence of fascioliasis in cattle was 51.0% (Yadav *et al.* 2015); the prevalence of fascioliasis in cattle was 44.8% (Abraham *et al.* 2014) and the overall prevalence of fascioliasis was 66.14% (Karim *et al.* 2015).

Ali *et al.* / Prevalence of fascioliasis in cattle

This findings nearly supported by Chakraborty and Prodhan (2015), El-Tahawy *et al.* (2017) and Haleem *et al.* (2016). On the other hand, the findings of Yadav *et al.* (2015), Abraham *et al.* (2014), and Karim *et al.* (2015) are in disagreement with the present study results.

Table 1. Overall prevalence of fascioliasis in cattle

No. of cases recorded	<i>Fascioliasp.</i> Negative cases	<i>Fascioliasp.</i> Positive cases	Prevalence (%)
100	83	17	17

The variation with the findings of the present study was very high; it might be due to location, use of anthelmintic, season 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 *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).

Prevalence of fascioliasis on the basis of age

Study population of cattle was divided into three age groups i.e. young (6 month-1 year), adult (1-2 years) and old (2 and above years). It is found that age had significant ($P < 0.05$) effect on the prevalence of fascioliasis in cattle. The highest prevalence of fascioliasis was observed in the cattle group ages among old (24.14%) followed by adults (8.7%) and young (5.26%). In the present study, the odd ratio of Adult vs. Young (1.5) implied that the adult was 1.5 times more susceptible than young. Also the odd ratio of Old vs. Young (5.1) implied that the old was 5.1 times more susceptible than young. The odd ratio of Old vs. Adult (3.34) implied that the old was 3.34 times more susceptible than adult.

(Table 2).

The bovine fasciolosis was significantly ($p < 0.01$) higher in old cattle (76.43%) compared to adult (68.69%) and young (48.62%) (Karim *et al.* 2015). 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%), (Bhutto *et al.* 2012). The prevalence of *Fasciolagigantica* was highest in cattle of more than 36 months of age and lowest in the age of less than 12 months. Khandaker *et al.* (1993). The prevalence of *F. gigantica* was 7.2% in adult cattle; where 3.9% in young (Haleem *et al.* 2016). Young (6 to 18 months) are more infected compared to adult animals (Nathet *et al.* 2016) and the highest prevalence was observed in <2 age group (10.91%), and the lowest was >3 age groups (8.35%), (El-Tahawy *et al.* 2017). The result of the present study was nearly similar to the study of Karim *et al.* (2015), Bhutto *et al.* (2012), Khandaker *et al.* (1993) and Haleem *et al.* (2016). All of those agree that the old cattle are higher prevalence than

young and adult. But the results of Nath *et al.* (2016) and El-Tahawy *et al.* (2017) disagree the present study.

Table 2: Age wise prevalence of fascioliasis

Age groups	No. of Observed	No. of infected	Prevalence (%)	Odd ratio
Young (6 month-1year)	19	1	5.26	Adult vs. Young=1.5
Adult (1-2 years)	23	2	8.7	Old vs. Young = 5.1
Old (2 and above years)	58	14	24.14	Old vs. Adult = 3.34
Total	100	17	17	
Chi-square Value		8.244		
P-value		0.016*		

* means significant at 5% of level of significance (P<0.05)

The findings of the present study were varying from previous study findings. In present study old (2 and above years) cattle was found more susceptible to fascioliasis, this might be due to old are comparatively more susceptible than the young and adult to be infected with intestinal parasite, it might because old cattle are frequently graze on the field so they have much more exposure on circulating cercariae and metacercariae.

Prevalence of fascioliasis on the basis of sex

The present study revealed that the prevalence of fascioliasis was significantly (P<0.05) affected by sex. In the present study the prevalence of fascioliasis of cattle in female was higher (28.95%) than in males (9.68%). In the present study, the odd ratio of female vs. male (3.80) implied that the female was 3.8 times more susceptible than male. (Table 3).

This study revealed that the prevalence of fascioliasis of cattle in female was higher (28.95%) than in males (9.68%). The higher prevalence of fascioliasis in female 52.83% followed by male 33.33% (Howlader *et al.* 2017); The female cattle 41.36% are highly susceptible than male 13.85% (Affroze *et al.* 2013); The female cattle 70.3% are highly susceptible than male 55.23% (Karim *et al.* 2015); The infestation of *Fasciolasp.* is more in female cattle 52.2% than male 47.8% (Nath *et al.* 2016); and the male 14% is highly susceptible than females 9.8% (Haleem *et al.* 2016).

The present study is similar to the findings of Howlader *et al.* (2017); Affroze *et al.* (2013), Karim *et al.* (2015); Nath *et al.* (2016). All of those agree that the female is higher prevalence than male. But Haleem *et al.* (2016) disagree with the present findings. Female cattle were more susceptible to *Fasciola* infection than males, the exact cause of this is still beyond questionable, 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).

Ali et al. / Prevalence of fascioliasis in cattle

Table 3: Sex wise prevalence of fascioliasis in cattle

Sex group	No. of observed	No. of infected	Prevalence (%)	Odd Ratio
Male	62	6	9.68	Female vs. Male=3.80
Female	38	11	28.95	
Total	100	17	17	
Chi-square Value		6.20		
P-value		0.013*		

* means significant at 5% of level of significance (P<0.05)

Prevalence of fascioliasis on the basis of nutritional status.

Study population of cattle was divided into two nutritional status groups (healthy and poor healthy). The present study revealed that the prevalence of fascioliasis was significantly (P<0.05) affected by nutritional status. The prevalence of fascioliasis in poor healthy was higher (22.39%) than in healthy (6.06%). In the present study, the odd ratio of poor healthy vs. healthy (4.47) implied that the poor healthy were 4.47 times more susceptible than healthy (Table 4).

Nutritional status was divided into two groups (healthy and poor healthy). The prevalence of fascioliasis in poor healthy was higher (22.39%) than in healthy (6.06%). The present study revealed that the prevalence of fascioliasis was significantly (P<0.05) affected by nutritional status. It was difficult to get enough secondary data related to this parameter, since many researchers talk to this in many ways, which may be mostly related to humans but not in cattle. The relationship between fascioliasis and nutritional status in 400 Mexican schoolchildren was investigated. More than half of the children in the study showed fascioliasis. The prevalence of fascioliasis infections was significantly (P < 0.05) affected by nutritional status (Quihui-Cota *et al.* 2004).

Table 4: Nutritional status wise prevalence of fascioliasis in cattle

Nutritional status groups	No. of observed	No. of infected	Prevalence (%)	Odd Ratio
Healthy	33	2	6.06	Poor vs Healthy=4.47
Poor healthy	67	15	22.39	
Total	100	17	17	
Chi-square Value		4.177		
P-value		0.041*		

* means significant at 5% of level of significance (P<0.05)

J. Sci. Technol. (Dinajpur) 20 (June 2022): 1-8

Mostly poor healthy can cause the cattle to become thin, lose muscle and be prone to infection, and also poor health can lead to many symptoms, including skin rash, depression, hair loss, tiredness, brittle bones and bleeding gums which makes the poor healthy cattle more susceptible than healthy.

CONCLUSION

This study confirms that fascioliasis is higher in the Sadar Upazila of Dinajpur district of Bangladesh. A complete anthelmintic programme should be taken to prevent fascioliasis in this region which will improve overall cattle health status. The present study results have some limitation due to small sample size, large study area and low duration of study may lead improper diagnosis. So, further detail epidemiological study is strongly recommended for proper diagnosis and control strategy of bovine fascioliasis in that area.

ACKNOWLEDEMENTS

This study was funded by Institute of Research and Training (IRT), Hajee Mohammad Danesh Science and Technology University, Bangladesh.

REFERENCES

- Abraham JT and Jude IB. 2014. Fascioliasis in cattle and goat slaughtered at Calabar abattoirs. *Journal of Biology, Agriculture and Healthcare*. 4: 34-40.
- Affroze S, Begum N, Islam MS, Rony SA, Islam MA and Mondal MMH. 2013. Risk factors and gross pathology of bovine liver fluke infection at Netrokona district, Bangladesh. *Journal of Animal Science Advances*. 3 (2): 83-90.
- Bhutto B, Arijo A, Phullan MS and Rind R. 2012. Prevalence of fascioliasis in buffaloes under different agro-climatic areas of Sindh Province of Pakistan. *International Journal of Agriculture and Biology*. 14(2): 241-245.
- Chakraborty P, and Prodhan MA. 2015. Coprological prevalence of bovine fascioliasis, its epidemiology and economic significance in Chittagong district, Bangladesh. *Livestock Research for Rural Development*. 27: 11-14.
- Chowdhury SM, Mondal MM, Islam FM, Taimur MJ, Biswas HR and Ershaduzzaman M. 1994. Prevalence of fascioliasis in cattle in Saver, Dhaka. *Indian Veterinary Journal*. 71(2): 121-123.
- El-Tahawy AS, Bazh EK and Khalafalla RE. 2017. Epidemiology of bovine fascioliasis in the Nile Delta region of Egypt: Its prevalence, evaluation of risk factors, and its economic significance. *Veterinary World*. 10(10): 1241-1249.

Ali et al. / Prevalence of fascioliasis in cattle

- Haleem S, Shadab F, Niaz S, Rehman HU, Sajad S, Qureshi NA and Kabir M. 2016. Prevalence of fascioliasis in cows and sheep in district Mardan (KPK), Pakistan. *Journal of Entomology and Zoology Study*. 4(3): 330-334.
- Haridy FM, Morsy TA, Gawish NI, Antonios TN and Abdel Gawad AG. 2002. The potential reservoir role of donkeys and horses in zoonotic Fascioliasis in Gharbia Governorate, Egypt. *Journal of the Egyptian Society of Parasitology*. 32(2): 561–570.
- Howlader BC, Rahman MM, Alam KJ, Moonmoon M and Howlader R. 2017. Study on Prevalence of Bovine Fascioliasis at Mirzaganj Upazilla of Patuakhali District in Bangladesh. *International Journal of Innovative Research*. 2(1): 09–12
- Karim MR, Mahmud MS and Giasuddin M. 2015. Epidemiological study of bovine fasciolosis: prevalence and risk factor assessment at Shahjadpur upazila of Bangladesh. *Immunology and Infectious Diseases*. 3(3): 25-29.
- Khandaker MU, Chanda PK and Rahman E. 1993. Hepatic changes of cattle naturally infected with *Fasciola gigantica*. *Bangladesh Veterinary Journal*. 3: 33-44.
- Khatun MS, Assaduzzaman M, Pallab MS and Chakraborty P. 2015. Risk factors analysis of fascioliasis in two geo-climatic regions of Bangladesh. *International Journal of Scientific Research*. 4 (11): 41-43.
- Lessa CS, Scherer PO, Vasconcelos MC, Freire LS, Santos JA and Freire NM. 2000. Registro de *Fasciola hepatica* equines (*Equus caballus*), caprinos (*Capra hircus*) ovinos (*Ovis aries*), no município de Itaguaí, Rio de Janeiro, Brasil. *Revista Brasileira de Ciência Veterinária*. 7: 63-64.
- Molina EC, Gonzaga EA and Lumbao LA. 2005. Prevalence of infection with *Fasciola gigantica* and its relationship to carcass and liver weights, and fluke and egg counts in slaughter cattle and buffaloes in Southern Mindanao, Philippines. *Tropical Animal Health and Production*. 37(3): 215-221.
- Nath TC, Islam KM, Ilyas N, Chowdury JK and Bhuiyan JU. 2016. Assessment of the prevalence of gastrointestinal parasitic infections of cattle in hilly areas of Bangladesh. *World Scientific News*. 59: 74-84.
- Ogunrinade A and Ogunrinade BI. 1980. Economic importance of bovine Fascioliasis in Nigeria. *Tropical Animal Health and Production*. 12 (3): 155–160.
- Quihui-Cota L, Valencia M, Crompton D, Phillips S, Hagan P, Diaz-Camacho S and Triana Tejas A. 2004. Prevalence and intensity of intestinal parasitic infections in relation to

J. Sci. Technol. (Dinajpur) 20(June 2022): 1-8

nutritional status in Mexican schoolchildren. Transactions of the Royal Society of Tropical Medicine and Hygiene. 98 (11): 653-659.

Siddiki AZ, Uddin MB, Hasan MB, Hossain MF, Rahman MM, Das BC, Sarker MS and Hossain MA. 2010. Coproscopic and haematological approaches to determine the prevalence of helminthiasis and protozoan diseases of Red Chittagong Cattle (RCC) breed in Bangladesh. Pakistan Veterinary Journal 30 (1): 1-6.

Soulsby E.J.L. 1965. Textbook of Veterinary Clinical Parasitology. Helminths. Blackwell Scientific Publications, Oxford. PP: 995-1022.

Tembely S, Coulibaly E, Dembele K, Kayentao O and Kouyate P. 1995. Intermediate host populations and seasonal transmission of *Fasciola gigantica* to calves in central Mali, with observations on nematode populations. Preventive Veterinary Medicine. 22 (1-2): 127-136.

Vercruyse J and Claerebout E. 2001. Treatment vs. non-treatment of helminth infections in cattle: defining the threshold. Veterinary Parasitology, 98: 195–214.

Yadav SK, Ahaduzzaman M, Sarker S, Sayeed MA and Hoque MA. 2015. Epidemiological survey of fascioliasis in cattle, buffalo and goat in Mahottari and Dhanusha, Nepal. Journal of Advance Parasitology. 2 (3): 51-56.