



RESEARCH ARTICLE

Prevalence of *Fasciola sp.* infection in ruminants

M. Al Mamun<sup>1</sup>, M. Jamal Uddin Bhuiyan<sup>1</sup>, M. Ali Zinnah<sup>2</sup>, M. Mahmudul Hassan<sup>3</sup>, Mohammad Atikuzzaman<sup>4</sup>,  
M. Bashir Uddin<sup>4\*</sup>

Özet

**Mamun MA, Bhuiyan MJU, Zinnah MA, Hassan MM, Atikuzzaman M, Uddin MB.** Ruminantlarda *Fasciola sp.* enfeksiyonunun prevalansı. *Eurasian J Vet Sci*, 2011, 27, 4, 241-244

**Amaç:** Araştırmanın amacı farklı tür ve yaşta bulunan ruminantlarda farklı mevsimlerde *Fasciola sp.* enfeksiyonunun prevalansını belirlemektir.

**Gereç ve Yöntem:** Gayta örnekleri Bangladeş'in Kishoregonj bölgesinde dört mevsim (kış, ilkbahar, yaz ve sonbahar) süresince toplandı. Hayvanlar tür ve yaşlarına (<2 yıl ve >2 yıl) ayrıldı. Natif ve sedimentasyon teknikleri kullanılarak yumurtalar belirlendi.

**Bulgular:** 6220 ruminantın 2319 adetinin *Fasciola sp.* ile enfekte (%37) olduğu belirlendi. Enfeksiyon oranı mandalarda (%44.49) sığırlar (%37.90) ve keçilerden (%32) yüksek belirlenirken, en az koyunlarda (%30.91) belirlendi. Enfeksiyon en fazla sonbahar (%47.34) en az yazın (%26.96) gözlemlendi ( $p<0.05$ ). *Fasciola sp.* yaşlı hayvanlarda (%39.63) gençlerden (%33.95) daha fazla belirlendi.

**Öneri:** Araştırma sonucu ruminantlarda hastalığın kontrol edilmesine ve sanitasyon programına ihtiyaç olduğunu göstermektedir.

Abstract

**Mamun MA, Bhuiyan MJU, Zinnah MA, Hassan MM, Atikuzzaman M, Uddin MB.** Prevalence of *Fasciola sp.* infection in ruminants. *Eurasian J Vet Sci*, 2011, 27, 4, 241-244

**Aim:** The objective of the study was to determine the prevalence of *Fasciola sp.* infection in ruminants of different species, age groups and in seasons.

**Materials and Methods:** Faecal samples were collected during four seasons (winter, spring, summer and autumn) from Kishoregonj district of Bangladesh. Animals were divided into species and ages (<2 years and >2 years). Native and sedimentation techniques were used to determine the eggs.

**Results:** Out of the 6220 ruminants, 2319 were infected (37%) with *Fasciola sp.* The infection rate was highest in buffaloes (44.49%) then cattle (37.90%), goat (32%) and lowest was recorded in sheep (30.91%). Maximum rate of infection was recorded ( $p<0.05$ ) in autumn (47.34%) and lowest rate was recorded in summer (26.96%). *Fasciola sp.* was observed higher in older animals (39.63%) than younger (33.95%).

**Conclusion:** This result therefore calls for an improved disease control and adequate sanitation programme for ruminants.

<sup>1</sup>Department of Pathology and Parasitology, <sup>2</sup>Department of Microbiology and Hygiene, <sup>4</sup>Department of Medicine and Surgery, Sylhet Agricultural University, Sylhet, <sup>3</sup>Department of Physiology, Pharmacology and Biochemistry, Chittagong Veterinary and Animal Sciences University, Chittagong, Bangladesh

Received: 22.05.2011, Accepted: 19.07.2011  
\*bashir\_vet@yahoo.com

Anahtar kelimeler: *Fasciola sp.*, prevalans, ruminant

Keywords: *Fasciola sp.*, prevalence, ruminant

## ► Introduction

Bangladesh is a subtropical country with subsistence agro based economy. Livestock is considered to be the backbone of agriculture (Anonymous 1985). There are about 44.835 million ruminants (cattle, buffalo, goat, sheep 26.828, 0.544, 16.242, 1.221 million respectively) in Bangladesh (BBS 2010) which plays an important role in the rural economy (Kamaruddin 2003). It is reported that more than 20% of the rural population of our country are engaged in this sub sector for their subsistence (Samad 1996).

The temperature, humidity and rainfall of the country are highly favorable for parasites. In Bangladesh parasitism has been considered as one of the major constraints of livestock production. Among the parasitic diseases, fascioliasis is an economically important of livestock particularly in cattle, buffalo, goats and sheep. This disease causes enormous economic losses all over the world and these losses are due to reduction in milk and meat production, condemnation of liver, loss of draught power, reproductive failure and mortality (Rahman and Rahman 1972, Fabiyi 1986, Diaw et al 1998). Failure to control the disease was mainly due to lack of information about its epidemiology. In recent years, however, a substantial amount of information has become available to understand the environment-host-parasite interrelationships.

Present study has been undertaken in Bajitpur and Austagram Upazilla of Kishoregonj district in Bangladesh to find out the prevalence of fascioliasis in ruminants with the influence of species, season and age.

## ► Materials and Methods

The data was collected from the Bajitpur and Austagram upazilla Veterinary Hospital under Kishoregonj district of Bangladesh. All the animals were recorded in the daily patient register book and faecal samples were collected. During the year of 2007 a total of 4145 cattle, 681 buffalo, 1284 goat, and 110 sheep were drawn to the Hospitals by the owners for diagnosis of different diseases including fascioliasis. In geographical considerations, study area are low lying area and there are four distinct seasons i.e. winter (Nov.-Feb.), spring (Mar.-April), summer (May-Aug.) and autumn (Sep.-Oct.) and the animals were alienated into four separate groups according to the species. Animals were also separated into two groups according to their age (<2 years and >2 years). Age of the animal was determined by estimation of dentition (Andrew et al 1990) as well as owner's complaint.

A total of 6220 animals were examined for fascioliasis. Fecal samples (approximately 10 g) were collected directly from the rectum of the animal using polythene gloves and then stored in small plastic container. Gross examination of fecal samples (color, odor, consistency etc) two different types of qualitative analysis, namely direct & simple sedimentation method were followed

to detect the parasitic eggs in the fecal materials. The direct smear method for fecal examination were performed as described by Samad (1996) and Hossain and Ali (1998). At least three smears were prepared for each sample and eggs were identified on the basis of their morphological features (Thienpont et al 1980). In addition to native technique, all the faecal samples were further analysed using sedimentation technique (Soulsby 1986). This method usually recovers most liver fluke eggs. *Fasciola* sp. eggs were identified on the basis of morphology (Soulsby 1986).

The data were recorded in the separate log book. Descriptive statistic as provided by the STATA and MS Excel 2007 software used to represent ensuing data. Irrespective of the gender issue, season and age relatedness to disease prevalence were explored with the chi square test of significance ( $p < 0.05$ ). Prevalence was expressed as the percentage of animals infected.

## ► Results

A total of 6220 ruminant animals were examined and 2319 (37%) were positive for *Fasciola* sp. infection (Table 1). Total number of 4145 cattle, 681 buffalo, 1284 goat and 110 sheep were examined, and the highest infection rate was found in buffaloes (44.49%) then cattle (37.90%), goat (32.0%) and sheep (30.91%). Season wise prevalence rates of *Fasciola* sp. is presented in the Table 2. Among the ruminants, the overall highest prevalence was found during autumn (47.34%) followed by winter (43.07%), spring (27.62%) and summer (26.96%). Age related distribution of *Fasciola* sp. in ruminants is shown in Table 3. Out of 3646 adult ruminants (>2 yrs) examined, 1445 (39.63%) were infected, while out of 2574 young animals (<2 yrs), 874 (33.95%) were infected.

Table 1. Prevalence of *Fasciola* sp. infection in different species.

	Examined	Infected	% prevalence
Cattle	4145	1571	37.90%
Buffalo	681	303	44.49%
Goat	1284	411	32.00%
Sheep	110	34	30.91%
Overall	6220	2319	37.28%

## ► Discussion

Fascioliasis has been implicated as the cause of morbidity and mortality in the production of ruminants (Okoli 2001). Out of the 6220 ruminants, 2319 were infected with *Fasciola* sp. The overall prevalence rate (Table 1) was correlated with the findings of Islam and Taimur (2008), Kanyari et al (2009), Keyyu et al (2005), Adhikari et al (2003) and Chaudhry et al (1993). The heavy rainfall in the summer and autumn, deep fog in the winter and also low lying region might be the causes of higher prevalence of the disease in the area where this study was carried out. Kabir et al (2010) reported a relatively low prevalence of *F. gigantica* in cattle (27.26%) and buffaloes (10.00%).

Table 2. Seasonal prevalence of liver fluke (*Fasciola sp.*).

Species	Winter			Spring			Summer			Autumn		
	Examined	Infected	%									
Cattle	1290	577	44.73	631	173	27.42	1267	338	26.67	957	483	50.47
Buffalo	257	116	45.14	73	23	31.51	126	43	34.12	225	121	53.77
Goat	397	144	36.27	172	45	26.16	393	101	25.69	322	121	37.58
Sheep	27	12	44.44	11	4	36.36	13	3	23.07	59	15	25.42
Overall	1971	849	43.07	887	245	27.62	1799	485	26.96	1563	740	47.34

A significant difference between various seasons was recorded (cattle:  $\chi^2=187.0720$ ,  $p<0.001$ ; buffalo:  $\chi^2=18.3639$ ,  $p<0.001$  and goat:  $\chi^2=17.7926$ ,  $p<0.001$  but non significant in sheep:  $\chi^2=3.6743$ ,  $p>0.299$ ).

Table 3. Age related distribution of *Fasciola sp.* infection in ruminants.

Species	<2 years			>2 years		
	Examined	Infected	%	Examined	Infected	%
Cattle	1512	543	35.91	2633	1028	39.04
Buffalo	70	30	42.85	611	273	44.68
Goat	911	279	30.63	373	132	35.39
Sheep	81	22	27.16	29	12	41.38
Overall	2574	874	33.95	3646	1445	39.63

A non significant difference between various age groups was observed (cattle:  $\chi^2=3.9985$ ,  $p<0.046$ ; buffalo:  $\chi^2=0.0846$ ,  $p<0.771$ ; goat:  $\chi^2=2.7587$ ,  $p<0.097$  and sheep:  $\chi^2=2.0217$ ,  $p>0.155$ ).

Sarder et al (2006), Maqbool et al (2002), Hossain et al (2011), Selim et al (1997), Islam and Taimur (2008) also reported a relatively low prevalence in cattle, buffaloes, sheep and goat. The variation may be due to geoclimatic condition because the study area is the low lying area of Bangladesh and most of the animals graze on the low land where the intermediate host snail is available.

By the data analysis, we observed that cattle ( $p<0.001$ ), buffalo ( $p<0.001$ ) and goat ( $p<0.001$ ) were significantly different than sheep ( $p<0.299$ ) among the four seasons. We also found that the maximum prevalence of liver fluke was found after the summer season when the snail prevalence was maximum. This observation appeared in agreement with the earlier reports of Maqbool et al (2002) and Sarder et al (2006). The reason for the more prevalence of *Fasciola sp.* after summer season may be due to conductive factors like presence of marshy places with grass at the canal banks (to which cercariae attach) and presence of snails in the area. These findings are in accordance with Tahir (2002), Dipeolu et al (2000). Yuling and Zang (1997) reported that outbreaks of fascioliasis occurred after flooding. Climate conditions particularly rainfall were frequently associated with differences in the prevalence of the fasciola infection because this was suitable for intermediate host like snails to reproduce and to survive longer under moist conditions (Ahmed et al 2007).

On investigation, it was discovered that overall highest prevalence (39.63%) in age group of >2 years and lowest (33.95%) in age group of <2 years but there were no statistical significant differences ( $p>0.05$ ). These findings were similar with the study of Hossain

et al (2011) and Tasawar et al (2007). The higher infection rate in older animals could be due to long time exposure to disease entity and their grazing habit close to submerge areas. This finding may be due to the more exposure of animals with *Fasciola sp.* infection and lack of anthelmintic treatment.

### ► Conclusions

This study therefore gives an initial overview on the prevalence and distribution of fascioliasis in the Bajitpur & Austagram Upazilla at Kishoregonj district of Bangladesh. It furthermore suggests the need for a specific area as well as nationwide baseline data on the prevalence and distribution of *Fasciola sp.* infection to prevent the infections of animals and ensure maximizing the animal production.

### ► References

- Adhikari B, Shrestha B, Shrestha RM, 2003. A study on the prevalence and diversity of *Fasciola spp.* in buffaloes and cattle in areas of Kathmandu Valley. Central Veterinary Laboratory Technical Annual Report, 1, 59-66.
- Ahmed EF, Markvichtr K, Tumwasorn S, Koonawootrittriron S, Choothesa A, Jittapalapong S, 2007. Prevalence of *Fasciola spp.* infections of sheep in the middle awash River Basin, Ethiopia. Southeast Asian J Trop Med Public Health, 38, 51-57.
- Anonymous, 1985. Asian Livestock Society, Volume X, 5, pp: 49.
- Andrew CE, Milles BM, Ettunne S, 1990. A survey of the intestinal nematodes of business in Namibia. J Trop Med Hyg, 42, 243-247.
- Bangladesh Bureau of Statistics (BBS), 2010. Report of the Household-based Livestock and Poultry Survey 2009.
- Chaudhry SS, Gupta RP, Kumar S, Singh J, 1993. Epidemiology and control of fascioliasis in cattle and buffaloes in

- Harayana, India. *Indian J Anim Sci*, 63, 600-605.
- Dipeolu MA, Dipeolu AO, Eruvbetine D, 2000. The Prevalence of fascioliasis in South Western Nigeria (1986 – 1991). *Int J Anim Sci*, 15, 151-152.
- Diaw DT, Seye M, Sarr Y, 1998. Epidemiology of trematodiasis in livestock in the Kolda region, Casamance. *Rev Elev Med Pays Vet Trop*, 41, 257-264.
- Fabiyi JP, 1986. Production losses and control of helminthes in ruminants of tropical regions. *Parasitology*, 17, 435-442.
- Hossain MM, Paul S, Rahman MM, Hossain FMA, Hossain MT, Islam MR, 2011. Prevalence and economic significance of Caprine fascioliasis at Sylhet district of Bangladesh. *Pak Vet J*, 31, 113-116.
- Hossain MA, Ali KM, 1998. Effects of anthelmintics on the body weight of goat naturally infected with fasciolosis and gastrointestinal nematodiasis. *Bangladesh Vet J*, 32, 41-46.
- Islam KBMS, Taimur MJFA, 2008. Helminthic and protozoan internal parasitic infections in free ranging small ruminants of Bangladesh. *Slov Vet Res*, 45, 67- 72.
- Kabir MHB, Eliyas M, Hashem MA, Mohiuddin, Miaz OM, 2010. Prevalence of zoonotic parasitic diseases of domestic animals in different abattoir of Comilla and Brahman Baria region in Bangladesh. *Univ J Zool Rajshahi Univ*, 28, 21-25.
- Kamaruddin KM, 2003. Goat farming as a means of poverty alleviation. In: Proceedings of BSVER symposium. Goats farming in Bangladesh; Problems and prospects. BAU. Bangladesh Society for Veterinary Education & Research. BSVER Publications, 25, pp: 26-34.
- Kanyari PWN, Kagira JM, Mhoma RJ, 2009. Prevalence and intensity of endoparasites in small ruminants kept by farmers in Kisumu Municipality, Kenya. *Livestock Research for Rural Development*, 21, 11, 202.
- Keyyu JD, Monrad J, Kyvsgaard, NC, Kassuku AA, 2005. Epidemiology of *Fasciola gigantica* and *Amphistomes* in Cattle on Traditional, Small-scale Dairy and Large-scale Dairy Farms in the Southern Highlands of Tanzania. *Trop Animal Health Prod*, 37, 303-314.
- Maqbool A, Hayat CS, Akthar T, Hashmi HA, 2002. Epidemiology of fascioliasis in buffaloes under different managemental conditions. *Vet Archive*, 72, 221-228.
- Okoli IC, 2001. Analysis of abattoir records for Imo State, Nigeria, 1995-1999: 1: Disease incidence in cattle, sheep and goats. *Intl J Agr Rural Dev*, 2, 97-103.
- Rahman MA, Ali AK, Rahman A, 1972. Incidence of diseases of cattle in Mymensingh. *Bangladesh Vet J*, 6, 25-30.
- Samad MA, 1996. *Poshu palon o chikissavidya* [In Bengali], 1<sup>st</sup> edition, LE Publications, Dhaka, Bangladesh.
- Sarder SA, Ehsan MA, Anower AKMM, Rahman MM, Islam MA, 2006. Incidence of liver flukes and gastrointestinal parasites in cattle. *Bangl J Vet Med*, 4, 39-42.
- Selim M, Sen MM, Rahman A, 1997. An abattoir survey on the liver diseases of Black Bengal goats. *Bangladesh Vet J*, 31, 113-114.
- Soulsby EJJ, 1986. *Helminths, Arthropods and Protozoa of Domesticated Animals*, 7th edition, The ELBS and Baillier Tindall, London, UK.
- Tahir M, 2002. Epidemiology of Fascioliasis in Pakistan with special reference to southern Punjab. *Pak Vet J*, 12, 134.
- Thienpont D, Rochette F, Vanparijs OFJ, 1980. Diagnosing helminthiasis through coprological examination. *Amer J Trop Med Hyg*, 29, 1021.
- Tasawar Z, Minir U, Hayat CS, Lashari MH, 2007. The prevalence of *Fasciola hepatica* in goats around Multan. *Pak Vet J*, 27, 5-7.
- Yuliang J, Zang B, 1997. Epidemiological survey of Fascioliasis in Pakistan. *Trop J Parasitol*, 48, 302-303.