

Pakistan Journal of Life and Social Sciences

www.pjlss.edu.pk

RESEARCH ARTICLE

Prevalence of Bovine Fascioliasis in Different Commercial and Non-commercial Dairy Farms of District Rajanpur, Punjab, Pakistan

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ARTICLE INFO

Received: Apr 20, 2014

Accepted: Dec 03, 2014

Online: Dec 15, 2014

Keywords

Bovine fascioliasis
Prevalence
Rajanpur
Punjab-Pakistan

ABSTRACT

Among different animal diseases which hinder the animal health, parasitic infections have a big economic impact, especially in developing countries. Fascioliasis is one of the most common economically important parasitic diseases of domestic animals, particularly in cattle. The present study was carried out from June, 2012 to October, 2013 at different commercial and non-commercial dairy farms of district Rajanpur, Punjab, Pakistan to assess the prevalence of bovine fascioliasis. Out of total faecal samples examined, 27.0% (n=64/237) were positive for *Fasciola* (*F.*) species. The prevalence of bovine fascioliasis was found to be significantly affected ($P<0.05$) by the age of animal, in which young animals were affected more than adult animals. Sex of the animal was not found as a significant factor ($P>0.05$) affecting the prevalence of this disease. With respect to specie-wise prevalence, *F. hepatica* was found to be dominant in study area with a prevalence rate of 16.45% causing bovine fascioliasis; whereas, the prevalence of *F. gigantica* in study area was 8.43%. Moreover, mixed infection was also detected in this area with a prevalence rate of 2.11%. In conclusion, age is a major factor which influences the rate of prevalence of fascioliasis in cattle. Results of this study provide baseline for the animal health planners to formulate control strategies against fascioliasis.

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INTRODUCTION

Livestock is an important sector in Pakistan's economy and contribute about 11.8% in the GDP of Pakistan. It is considered to be a net source of invariable income for rural and middle grade agri-business holders and it plays a major role in poverty alleviation in rural areas of Pakistan (Anonymous, 2014). Cattle are not only main source of animal proteins but their products like bones, skin and goods made from their fetch are also of great importance for the human beings. The livestock industry is threatened by various parasitic organisms which cause watery diarrhea, weakness, weight loss, decrease in milk production, reduced product quality, mortality and other secondary infections in affected animals. Helminths parasite especially trematodes caused enormous loss to the livestock wealth. In most parts of the world, liver flukes are considered as one of

the major reasons behind production losses (Alawa et al., 2010).

The liver flukes are recognized as one of the most important herbivores helminthic parasites which are found in many parts of the world (Kantzoura et al., 2011). *Fasciola* species are common liver flukes in Pakistan (Lashari and Tasawar, 2011). The principal definitive hosts of these parasites are cattle, sheep and goat. However, certain other mammals, including humans, may also be infected (Onceição et al., 2004; McCann et al., 2010). Due to the increasing number of human cases, the liver flukes should be considered as an emerging threat of public health concern (Nguyen et al., 2009). On the other hand, they cause major diseases of livestock that produce important economic losses due to mortality, liver condemnation, reduced production of meat, milk and wool and expenditures on medication/anthelmintics (Alawa et al., 2010).

The prevalence of helminthes in different species of animals has been reported ranging from 21.41 to 92% in Pakistan (Iqbal et al., 2007; Lashari and Tasawar, 2011). Fascioliasis, parasitic gastro enteritis, hydatidosis, coccidiosis, ectoparasitism, theileriosis and babesiosis are the major parasitic problems of ruminants in Pakistan in the order of priority (Iqbal et al., 2002). The problem of fascioliasis has been diagnosed in all areas of the Punjab but is a main problem in swampy areas enriched with the intermediate hosts, like snails and is one of the main constraints in development of a profitable livestock industry. All the ungulates are invariably susceptible to this infection. A limited number of studies have been conducted to provide information on the prevalence of *Fasciola species* in cattle in different agro-climatic zones (Lashari and Tasawar 2011; Qureshi et al., 2012). Keeping in view the lack of such information, this study was designed to rule out the prevalence of fascioliasis in traditional cattle farming system of Rajanpur, Punjab, Pakistan. The information will provide a baseline for the animal health planners to formulate control strategies against fascioliasis.

MATERIALS AND METHODS

The present study was conducted during June, 2012 to October, 2013 to determine the prevalence of fascioliasis in cattle. A total of the 237 fecal samples were collected randomly from male and female cattles of different age groups. The samples were collected from commercial and non-commercial dairy farms and house-hold animals of district Rajanpur, Punjab, Pakiatan. The faecal samples (10g, each) were collected separately in wide-mouthed screw capped glass bottles containing 10% formalin as a preservative. All the samples were properly labeled. Fecal samples were examined for the presence of *Fasciola* eggs by sedimentation techniques and direct microscopic examination of faecal material.

RESULTS AND DISCUSSION

The overall prevalence of fascioliasis was 27% (n=64/237) in study area (Fig. 1). The prevalence of *F. hepatica* was significantly ($P<0.05$) higher (16.45%) as compared to those of *F. gigantica* (8.43%) and mixed infection of these *Fasciola* species (i.e. *F. hepatica* & *F. gigantica*) (2.11%). Table 1 shows the prevalence of bovine fascioliasis between the two sexes in the current study. Results revealed significant difference ($P<0.05$) in the prevalence of fascioliasis in males (29.88%) as compared to females (25.33%). Age-wise analysis revealed a statistically non significant difference ($P>0.05$) in the prevalence of fascioliasis in different age groups. Bovine fasciolosis exists in almost all

regions of Pakistan. However, the prevalence, epidemiology and *Fasciola* species involved vary with locality. It is mainly attributed to the variation in the weather and ecological condition such as altitude, rainfall, temperature and livestock management system (Graber, 1978). The result of present study indicated that bovine fasciolosis relatively spread with moderate prevalence rate of 27.0% in the study area as compared to high prevalence of 74.5 % in Iraq (Al-Khafajy, 2011), 42.06% in Sindh province of Pakistan (Bhutto et al., 2012) and 70.62% in different district of Punjab, Pakistan (Iqbal et al., 2007). The reported prevalence is relatively lower and this variation might be attributed to the difference in the infestation and agro-climatic variations of study area. The result of the present study is similar with the prevalence of bovine fascioliasis reported in Quetta, Balochistan (Kakar et al., 2011) but higher than that of Khan and Maqbool (2012) from slaughter houses (22.6%) livestock farms (17.5%), veterinary hospital (10.82%) and on household cattle (10.82%) under different management conditions. This is probably due to the ecological and climatic difference between the two localities.

A slightly higher incidence was observed in males than females. The reason for which seems to be related more to be social practice of keeping females under better management and feeding conditions in comparison to males which are generally being let loose to graze freely in pastures (Chaudhri et al., 1993; Maqbool et al., 2002; Phiri et al., 2005; Keyyu et al., 2009).

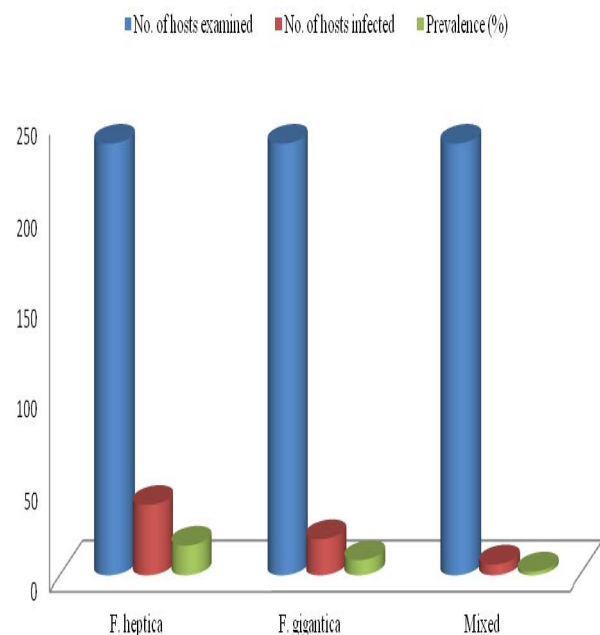


Fig. 1: The overall prevalence of *Fasciola* species in cattle in district Rajanpur during the year 2012-13.

Table 1: Relationship between age, sex of hosts and *Fasciola* species in district Rajanpur during year 2012-13

| | No. of samples examined | No. of positive samples | Prevalence (%) |
|--|-------------------------|-------------------------|----------------|
| Age-wise prevalence of bovine fascioliasis | | | |
| 1- 24 | 87 | 29 | 33.33 |
| 25-48 | 61 | 18 | 29.50 |
| 49-72 | 58 | 13 | 22.41 |
| >72 | 31 | 4 | 12.9 |
| Sex-wise prevalence of bovine fascioliasis | | | |
| Male | 78 | 26 | 29.88 |
| Female | 150 | 38 | 25.33 |

Prevalence of fascioliasis was recorded to be highest in 1-24 months age group after which prevalence goes on decreasing gradually with advancement in age in descending order of 25-48 months, 49-72 months and >72 months, respectively. Decrease in prevalence of at age higher than 72 months is due to the fact that cattle present that resistance to challenge infection. Hillyer et al. (1999) stated that adult cattle are more resistant to infection or they may self cure. There are some reports that resistance is not totally immunologically based. Rather it is suggested that hepatic fibrosis resulting from primary infection may be the reason for resistance to reinfection (Mulcahy et al., 1999). Similar results were reported by Keyyu et al. (2005) who associated higher infection rate in older animals with age and consequently longer exposure time.

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