

IMPACT OF SEASON, SEX, AGE, AND AGRO-ECOLOGY ON THE PREVALENCE OF FASCIOLIASIS IN BUFFALOS OF LADAKH

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ABSTRACT: Studies on fascioliasis of buffalos were undertaken at slaughter houses, household and livestock farms under different climatic conditions existing in Ladakh region of Jammu and Kashmir State in order to find out the various associated factors and their impact on the prevalence of fascioliasis. The study revealed that the infection rate was 62.05%, 34.37%, and 27.77% respectively in slaughtered, livestock farm and household buffalos with an overall prevalence of 42.59%. Significant variations were observed in the prevalence with respect to various factors of the host as well as the study area; of which the most important one was the climate. Overall highest (48.14%) seasonal prevalence in all types of buffalos was recorded during wet season while as only (37.03%) was recorded during the dry season. It was noticed that a higher (45.83%) infection rate was recorded in younger (>3 years) buffalos than in adult ones (40.00%). Sex of the host was also found having an impact on the prevalence wherein females were more infected (46.42%) than males (38.46%). It was also observed that the infection rate was high (44.62%) in comparatively low land areas as compared to high altitudes (40.38%). Therefore it was concluded that the prevalence of fascioliasis is very high in buffalos of this region and season and locality of the region as well as sex and age of the host species plays an important role in the prevalence of fascioliasis and it is a hope that this study will provide necessary information regarding fascioliasis in buffalos of Ladakh (where livestock rearing is one of the important sources of livelihood) for their effective management and hence for a better production which will benefit the resource poor people of this region.

Keywords: Prevalence, Fascioliasis, buffalos, Ladakh

INTRODUCTION

Fascioliasis is a wide spread helminthiasis responsible for immense economic losses in buffalos in terms of livers, decreased milk and meat production, loss of weight and poor carcass quality. Fascioliasis is characterized by sudden death with bloodstained froth at the natural orifices in acute cases. Diarrhea, jaundice and bottle jaw are predominant features in chronic cases. This disease entity causes losses in terms of morbidity and mortality in flukey areas. Surveys in some Asian countries have shown that amongst domestic animals, buffalos suffer more from Fascioliasis.

In developed countries data on various aspects of helminthiasis are published in an efficient manner as an aid to combat infection more effectively. In contrast, in developing countries little published information exists on the epidemiological aspect of helminthic infections, particularly on fascioliasis. Although some work has been carried out from Jammu and Kashmir region but no work has been done on fascioliasis of buffalos in this region which is largely dependent on domestic ruminants including buffalos. Surveys in some Asian countries have shown that among domestic animals, buffaloes are the most suffering animals from fascioliasis (Sandra et al., 2003). The prevalence is high in areas surrounding dams or large ponds in which *Lymnaea auricularia rubiginosa*, the intermediate host of *F. gigantica* is found. An epidemiological study revealed that the disease has a seasonal pattern from which the following conclusion for control of the disease can be drawn. Strategic liver fluke treatment of all cattle and buffaloes which are older than 8 months should be carried out once a year. In addition, animals in poor condition should be treated to prevent severe losses, especially in high prevalence areas or where strategic treatment was missed. Problems of liver fluke control include the lack of knowledge about the parasite at farmers level and the lack of availability of drug supplies at the village level, both of which are important to allow strategic treatment of animals (Srihakim et al., 1991). In the present study an attempt was made to find out the impact of season, sex, age, and agro-ecology on the prevalence of fascioliasis in buffalos of Ladakh to provide a base line data and it was observed that all these factors are associated with prevalence of fascioliasis. This the reason for

this paper, which records the prevalence of fascioliasis in buffalos in the Ladakh (J&K) in relation to climatological factors, host age, sex and agro ecology of the region and is an attempt to bridge the gap in knowledge of these aspects.

MATERIALS AND METHODS

Survey of fascioliasis in slaughter houses

To record the prevalence a systematic survey of various slaughter houses was carried by visiting the abattoirs at weekly intervals during the study. Post-mortem examinations of slaughtered animals were carried out and livers were checked out for the presence of flukes. The date, age, sex and locality were recorded. The number of total and infected animals was also recorded in order to determine the disease prevalence.

Fascioliasis in live animals

Epidemiological and helminthological studies were performed at livestock farms and on household buffalo in both the districts of the study area followed by standard methods of (Urquhart et al., 1988). During the studies the seasonal prevalence was recorded. For this purpose the year was divided into two seasons as follows: wet season and dry season. The prevalence in relation to age, sex and agro-ecology was also defined.

Parasitological techniques

Flukes recovered from each of the livers during the survey in slaughter houses were counted and morphologically identified as *F. hepatica* and *F. gigantica*. Faecal samples were examined by direct smear, flotation and sedimentation techniques for the presence of fluke eggs (Urquhart et al., 1988). The counting of eggs was performed by McMaster egg counting technique (Urquhart et al., 1988). Identification of adult flukes as well as eggs was done on the basis of morphology (Soulsby, 1982).

Meteorological data

The climatological data was provided by government meteorological department Ladakh.

RESULTS

During the study year 40 buffalos at slaughterhouses, 32 household and 36 livestock farm buffalos were examined of which 25 (62.5%) slaughtered, 11 (34.37%) at livestock farms and 10 (27.77%) household buffalos were found infected with either of the two species of *F. viz; F. hepatica* or *F. gigantica* or sometimes with both of these two species. It was also noticed that *F. gigantica* was predominant over *F. hepatica*. Overall infection rate was 46 (42.59%). It was noticed that prevalence was higher in buffalos at slaughterhouses (62.07%) followed by livestock farms (33.20%) and household buffalos (25.65%) respectively (Table1).

Table 1. Over all Prevalence of Fascioliasis in buffalos			
Buffalo	Number Examined	Number Positive	Percentage
Slaughtered	40	25	62.5
Livestock	32	11	34.37
Household	36	10	27.77
Total	108	46	42.59

In all the buffalos overall prevalence recorded was higher during wet season (48.14%) as compared to the dry season (37.03%) (Table 2). A positive correlation of disease prevalence to rainfall, morning and evening humidity and minimum temperature has been recorded. Correlation between disease prevalence and other meteorological factors was not significant.

Table 2. Seasonal prevalence (%) of Fascioliasis in buffalos			
Season	Number Examined	Number Positive	Percentage
Wet	54	26	48.14
Dry	54	20	37.03

Table 3. Age wise prevalence (%) of Fascioliasis in buffalos			
Age group	Number Examined	Number Positive	Percentage
Young (>3 Years)	48	22	45.83
Adult (<3 Years)	60	24	40.00

The occurrence of fascioliasis was more frequently recorded in younger buffalos (45.83%) than in adult ones (40.00%) which were above two years of age (Table 3). Similarly differences were found in infection rate with regard to the sex of the host wherein females were more infected (46.42%) as compared to their counter partners (38.46%) (Table 4).

Sex	Number Examined	Number Positive	Percentage
Males	52	20	38.46
Females	56	26	46.42

Furthermore the present study also revealed a correlation of disease prevalence to agro-ecology of the study area; the prevalence was high (44.62%) in low land areas (Kargil) as compared to a comparatively high altitude (Leh), (40.38%) (Table 5).

Agro-ecology	Number Examined	Number Positive	Percentage
Low-land (Kargil)	56	25	44.62
High-altitude (Leh)	52	21	40.38

DISCUSSION

The occurrence of fascioliasis in an area is influenced by a multifactorial system which comprises hosts, parasite, management, and environmental effects. In the natural foci of fascioliasis, The *Fasciola* and their immediate and final host form an association posing a potential epidemiological threat and it is important that the existence and localization of such an association should be recognized beforehand so that the situation can be brought under control.

In the present study, epidemiological data on fascioliasis were collected from buffalos in slaughterhouses, livestock and household of Kargil and Leh districts of Ladakh. When the data on seasonal prevalence in all the three groups of buffalos were analyzed it was observed that a higher prevalence of fascioliasis occurred during wet season as compared to dry season. The higher prevalence in wet season than dry season is in agreement with many reports around the world, (Gupta et al., 1986; Al-Khafaji et al., 2003; Yadav et al., 2007; Ferreria, et al., 1981; Maqbool et al., 1994). This could be due to the existence of a direct relationship between prevalence with the rainfall, humidity and temperature. In this study, the presence of sufficient rainfall and moisture during the wet season favored the survival of infective larvae in the pasture, emergence of cercaria from snails which results in higher probability of uptake of the infective larvae leading to higher prevalence rate (Sissay et al., 2007). Also during the wet season the snails which usually remain under the mud get exposed by rain and float along with the water and are being eaten by the animals along with water which also increase the infection rate.

The study further reveals that sex of the animals showed an association with the prevalence of the parasites, it was observed that females were more infected than their counter partners this statement is in consistent with Dhar et al. (1988) and Dutt et al. (1995). This could be due to some physiological peculiarities of the female animals, which usually constitute stress factors thus, reducing their immunity to infections, and for being lactating mothers, females happen to be weak/malnourished, as a result of which they are more susceptible to the infections besides some other reasons (Blood and Radostists, 2000).

Similarly, the higher prevalence recorded in younger animals as compared to the adult ones is in agreement with Ferreria et al., 1981; Shah-Fischer and Say, 1989; Nganga et al., 2004, from different corners of the world. The reason for which could be the fact that younger animals are more susceptible to infections than adults. Adult animals may acquire immunity to the parasites through frequent challenge and expel the ingested parasite before they establish infection, (Dunn, 1978; Shah-Fischer and Say, 1989).

The study also shows higher prevalence in Kargil district which is comparatively lowland as compared to Leh (high altitudes) this statement is in line with reports from many parts of world (Teklye, 1991; Yildirim et al., 2000; Fikru et al., 2006). These low lands are characterized by a comparatively hot humid environmental situation that is favorable for the survival of the infective larval stage of these parasites. One another possible reason for higher prevalence in Kargil district as compared Leh could be that the water bodies (from where the animals drink water) of Kargil district are comparatively more polluted which leads higher pick up of parasites and therefore high prevalence.

CONCLUSION

Therefore it is evident from the present study that fascioliasis in buffalos of Ladakh is very high and several factors have been found to be associated with it is the need of the present hour to take more steps to gather more

and more information regarding various aspects of helminthoses in this region and it is believed that the present study will provide some sort of help in the same direction.

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