VETERINARY SCIENCE RESEARCH JOURNAL
Volume 5 | Issue 1&2 | Apr. & Oct., 2014 | 54-57
DOI : 10.15740/HAS/VSRJ/5.1and2/54-57
e ISSN-2230-942X | Visit us - *www.researchjournal.co.in*

A CASE STUDY

# Prevalence of fascioliasis in district Srinagar of Kashmir valley

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**Key words :** Fascioliasis, Prevalence of fascioliasis

**How to cite this paper :** Akhoon, Zubair Ahmad and Peer, F.U. (2014). Prevalence of fascioliasis in district Srinagar of Kashmir valley. *Vet. Sci. Res. J.*, **5**(1&2) : 54-57.

**Paper History :** Received : 27.08.2014; Accepted : 29.09.2014

## INTRODUCTION

*Fascioliasis* is the most common and important liver fluke disease having cosmopolitan distribution and is of economic importance only in sheep or cattle but may infest all domestic animals, many wild life species including human beings. Lymnaeid mud snails or intermediate hosts and release infective form, the metacercaria on to herbage. Important species in the genus Fasciola include :

*F. hepatica* (Large liver fluke)

*F. gigantica* (Giant liver fluke)

*F. Jaksoni* (Elephant liver fluke)

Among these species, only *F. hepatica* and *F. gigantica* are found in the state while *F. jaksoni* has not been reported in the state (possibly due to non presence of elephant). *F. hepatica* is cosmopolitan in distribution and is the cause of hepatic fascioliasis, liver fluke disease or liver rot in sheep and cattle while *F. gigantica* is common liver fluke of domestic stock in Africa and Asia. Important hosts snails for *F. hepatica* include :

*L. auricularia* in J and K (Dhar *et al.*, 1998)

*L. acuminata* in India and Pakistan

## RESEARCH METHODOLOGY

Although the *Fascioliasis* in herbivores has been recorded from different parts of India, information on the status of infection in the state is scanty rather lacking (Pandit *et al.*, 1988, Dhar *et al.*, 1988). Disease Investigation Centre (CVH) is currently the only place in the district where facilities to diagnose the disease and maintenance of disease records exist.

As per our survey, we studied the full existing record of the disease from 1st Jan., 2001 to 15th Dec., 2002. A total of 693 faecal samples were on record among which 361 samples were positive for liver flukes. Year wise, month wise, season wise distribution of the disease were then compiled by subjecting the record and data to statistical analysis as shown.

## RESULTS AND DISCUSSION

The study revealed that rate of infection starts increasing from spring reaches peak in early summer with lowest in winter, which is in conformity with findings of Dhar *et al.* (1989). The record also indicated that %age infection in different seasons and months of year 2002 was lower than year 2001 which possibly due to mass dosing of the livestock

for prophylactic purposes by common people. The highest month wise prevalence was recorded in May and lowest in the month of January as per the record.

A camp was also organized by Disease Investigation (CVH) at Brane, Nishat and Shalimar on 10th, 12th and 13th of june whereby faecal samples from different areas were collected for parasitological examination. A total of 171 faecal samples were collected mostly from bovines among which 94 samples were positive for liver flukes. On statistical analysis 55% infection was found, which could be possibly due to topographical reasons *i.e*. marshy, low lying and irrigated area. This study also revealed that young animals showed a relatively high infection rate compared to aged animals. This study also revealed that animals treated for fascioliasis were still carrying infections for Fasciola species which could possibly be due to either treatments being faulty or else the animals examined picked up infections after treatment from the field as none of the anthelmintics used against Fascioliasis have been shown to pocess chemoprophylactic and immunomodulatory properties. This obviously calls for frequent treatments at regular intervals and monitoring of animals at periodical interval in all programmes aimed at the control of the diseases of animals in the field.

Fascioliasis in livestock particularly in sheep has assumed on economic importance as heavy losses on inflicted in the form of diseases production, morbidity, mortality, high cost of treatment and possibly of exposure of animals to fatal

**Table 1 : Month wise distribution of *Fascioliasis* in district Srinagar**

| Year | Month | Total dung samples | Positive for Fasciola | Per cent age of infection |
|---|---|---|---|---|
| Year 2001 | January | 12 | 2 | 17 |
| | February | 39 | 12 | 31 |
| | March | 31 | 11 | 35 |
| | April | 27 | 17 | 63 |
| | May | 45 | 36 | 80 |
| | June | 20 | 15 | 75 |
| | July | 27 | 18 | 67 |
| | August | 111 | 60 | 54 |
| | September | 106 | 69 | 65 |
| | October | 32 | 20 | 63 |
| | November | 35 | 16 | 46 |
| | December | 18 | 6 | 33 |
| Year 2002 | January | 8 | 2 | 25 |
| | February | 13 | 5 | 38 |
| | March | 28 | 13 | 46 |
| | April | 20 | 8 | 40 |
| | May | 30 | 15 | 50 |
| | June | 14 | 6 | 43 |
| | July | 30 | 16 | 53 |
| | August | 20 | 8 | 40 |
| | September | 5 | 1 | 20 |
| | October | 10 | 3 | 30 |
| | November | 8 | 2 | 25 |
| | December | 2 | 0 | 0 |

**Table 2 : Season wise distribution of *Fascioliasis* in district Srinagar**

| Year | Season | Total dung samples | Positive for Fasciola | Per cent age infection |
|---|---|---|---|---|
| Year 2001 | Spring | 103 | 64 | 62 |
| | Summer | 158 | 88 | 56 |
| | Autumn | 173 | 105 | 61 |
| | Winter | 69 | 28 | 40 |
| Year 2002 | Spring | 78 | 36 | 46 |
| | Summer | 64 | 30 | 47 |
| | Autumn | 23 | 6 | 26 |
| | Winter | 23 | 7 | 30 |

diseases due to lowered body resistance. It has been difficult to assign reliable figures to economic losses in district Srinagar because livestock rearing is done mainly by nomadic herdsmen who drive their stock through vast distances in response to seasons and search at pasture's and water. Slaughtering and selling of meat is still largely done privately by individual owners with very limited supervision from health authorities. Then there is possibility that the full effect of Fascioliasis is masked by the practice of livestock owners culling their infected animals prematurely before the full effect of disease becomes apparent. Thus it is extremely difficult to estimate what losses occur specifically due to Fascioliasis.

**Table 3 : Mean of year wise and season wise distribution**

| Year 2001-02 | Spring | Summer | Autumn | Winter |
|---|---|---|---|---|
| 45.5 | 54 | 51.5 | 43.5 | 35 |

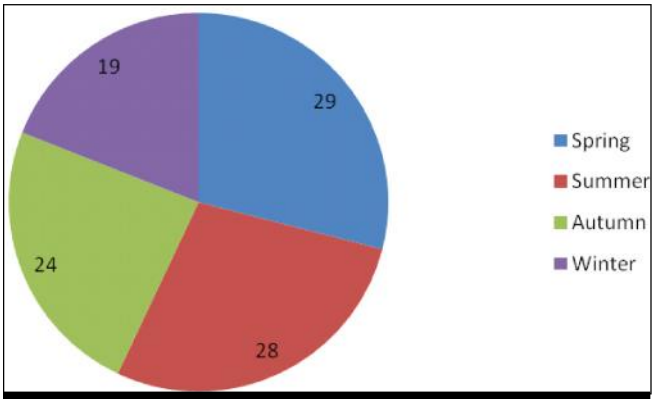


**Fig. 1 :**

The risk of hepatic fascioliasis is determined by the number of infected Lymnaeid snails in the grazing area. The disease has a predictable seasonal pattern in regions where snails are active for only part at the year. All Lymnaeid snails are restricted to dump and wet environment. In general they prefer non acidic low lying swampy areas. Snails barrow into the soil to survive periods to release cercariae when free water is present.

A simple approach to estimate the national impact of fasciolosis is to estimate prevalence in different systems and determine the loss caused by infestation per animal per year. Prevalence may vary from 0% to 100% over a comparatively short distance (Suhardono *et al.*, 2006). The occurrence of fascioliasis in an area is influenced by a multifactorial system which comprises hosts, parasite and environmental effects. Therefore, the national prevalence may cover certain areas of high risk and high prevalence and hence loss.

In the present study, a higher prevalence of fascioliasis was observed in the three groups of cattle 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, Firreria *et al.*,1981 and 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.*, 2006).The study further reveals that animals sex showed an association with the prevalence of the parasites, it was observed that females were more infected than their counter partners this is in consistent with Dhar *et al.* (1988); Fatima *et al.* (2008). This could be due to the physiological peculiarities of female animals, which usually constitute stress factors thus, reducing their immunity to infections and for being lactating mothers. Females are usually weak and malnourished and consequently are more susceptible to infections besides some other reasons (Blood and Radostitis, 2000). Similarly, a higher prevalence rate recorded in younger animals as compared to adult ones is in agreement with Firreria *et al.* (1981); Shah-Fischer and Say (1989); Kiyyu (2003); Nganga *et al.* (2004) from different countries of the world. The reason behind this observation may be the fact that younger animals are more susceptible to infections than adults. Adult animals may acquire immunity to parasites through frequent challenge and expel the ingested parasite before they establish infection (Shah-Fischer and Say,1989, Dunn, 1978). Ours findings are in agreement with others who have reported fascioliasis in different ruminants from same and different study areas. Yadav *et al.* (2004) reported a maximum prevalence of *Fasciola* spp. (5.15%) from bovines of R.S. Pura, Jammu. Khajuria and Kapoor (2003) from Kathua region of Jammu reported 8.11% and 5.83% as a prevalence of *Fasciola* spp. from sheep and goat, respectively. Yadav *et al.* (2006) from Jammu reported prevalence of *Fasciola* spp. as 3.08%. Pandit *et al.* (1989) studied the epidemiology of ovine fascioliasis in sheep of Jammu and Kashmir State and observed that 30% of sheep examined were positive for *Fasciola hepatica*. The overall prevalence of *Fasciola hepatica* was 28.75%. Sheikh *et al.* (2007) reported prevalence of bovine fascioliasis in Kashmir valley as 29.38±7.51%. The highest prevalence of *Fasciola hepatica* in spring and summer are in agreement with the findings of Khajuria and Kapoor (2003), Yadav *et al.* (2004), Pandit *et al.* (1989) who have reported maximum infection in summer and spring instead of winter and autumn. Environmental factors equally affect the fluke prevalence in all the host species. Rainfall, humidity and minimum temperature could possibly have positive relationship with fluke population while bright sunshine and maximum temperature causes evaporation faster and whatever the thin film of water on vegetation may

get dried off decreasing the survival of cercaria. Rainfall helps in increasing the fluke prevalence (Tamloorkar *et al*., 2002). When the animals cross one year of age the major part of their infection is eliminated because of development of self cure phenomenon and tend to remain relatively resistant to reinfection; however, constant exposure of some level of infection is required to maintain their resistant status.

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