

## Prevalence of Fasciolosis in Cattle Under Different Managemental Conditions in Punjab\*

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**Abstract.-** Epidemiology of fasciolosis was studied at slaughter houses, livestock farms, veterinary hospital and on household cattle under different managemental conditions. Infection rate was 22.6%, 17.5%, 10.82% and 8.76% respectively in slaughtered cattle, cattle at livestock farms, veterinary hospitals and household cattle. Overall highest seasonal prevalence in all types of cattle was recorded during autumn followed by spring and winter, while the lowest prevalence was recorded during summer. It was noticed that a higher infection rate was recorded in older and male cattle than in youngsters and females.

**Key words:** Epidemiology, economic losses, fasciolosis, cattle.

### INTRODUCTION

**F**asciolosis represents one of the most common liver parasitisms in humans and domestic ruminants and is present throughout the world where the climatic conditions are suitable for snails (*Lymnaea*), the intermediate hosts of *Fasciola gigantica* and *F. hepatica* (Torgerson and Clarton, 1999; Walker *et al.*, 2008). In domestic ruminants, adverse effects of acute or chronic fasciolosis include decreased meat and milk production, decreased fertility and increased veterinary costs (Urquhart *et al.*, 2001; Kithuka *et al.*, 2002; Theodoropoulos *et al.*, 2003; Swai and Ulicky, 2009).

The problem of fasciolosis appears to constitute a serious constraint to the development of cattle industry in Pakistan. Unfortunately, there is no up-to-date information on prevalence, seasonal variation and economic importance of fasciolosis in cattle in different districts of Punjab province. The objective of this study was to examine the status of the disease in Punjab province with the aim of highlighting the total liver condemnation and seasonal variation. Previously, the only work of significance on epidemiology and therapy of fasciolosis in buffaloes and cattle in Punjab is by

Maqbool *et al.* (1994), Maqbool (2002) and Siddiqui *et al.* (2002).

### MATERIALS AND METHODS

#### *Survey of fasciolosis*

To record the prevalence of fasciolosis a survey of 6 slaughter houses in Lahore, Gujranwala, Sheikhupura, Sargodha, Jhang and Faisalabad was carried out at weekly intervals from January to December, 1999. Postmortem examination of slaughtered animals was carried out and livers were checked for the presence of the parasites. The date, the number of total and infected animals along with their age and sex was also recorded as per formula of Thrusfield (1986).

The livestock farms, veterinary hospitals and household cattle in the districts of Lahore, Gujranwala, Sheikhupura, Sargodha, Jhang and Faisalabad were also surveyed for fasciolosis. During the study the month-wise and seasonal prevalence was recorded. For this purpose the year was apportioned into 4 seasons *i.e.*, spring (March-April), summer (May-August), autumn (September-October) and winter (November to February). The prevalence of fasciolosis in relation to age and sex was also noted.

#### *Parasitological techniques*

Flukes recovered from each of infected liver during survey in slaughter houses were counted and morphologically identified as *Fasciola gigantica* and *F. hepatica* (Ross *et al.*, 1966). Infection was

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detected on the basis of identification of eggs in faecal samples by direct smear, floatation and sedimentation techniques (Urquhart *et al.*, 2001). The counting of eggs was performed by McMaster egg counting technique (Kelly, 1974). Trematode eggs were identified on the basis of morphology (Yamaguti, 1975; Soulsby, 1982).

#### *Statistical analysis*

The data was analyzed statistically by using Analysis of Variance (Steel and Torrie, 1984).

### RESULTS

During the study year (January-December 1999) a total of 3056 at slaughter houses, 1280 at livestock farms, 5679 at veterinary hospitals and 5617 household cattle were examined. Of these 691 (22.61%) were slaughtered, 244 (17.05%) at livestock farms, 615 (10.82%) at veterinary hospitals and 493 (8.76%) household cattle were found infected with *Fasciola gigantica*. Overall infection rate was 13.06%. It was noticed that prevalence was higher in slaughtered cattle followed by animals at livestock farms, veterinary hospitals and the household cattle.

Among the slaughtered cattle the highest overall prevalence was recorded during autumn (41.95%) followed by spring (29.52%) and winter (17.8%). The lowest prevalence (14.1%) was recorded during summer. At livestock farm, the highest overall prevalence (29.52%) was recorded during autumn followed by spring (19.73%) and winter (14.03%), while the lowest prevalence was during summer (13.76%). At veterinary hospitals a peak (18.46%) of infection was recorded during autumn followed by spring (13.3%) and summer (8.74%). The lowest infection (7.92%) was recorded during winter. In household cattle two seasonal peaks were recorded, during spring and autumn, with an infection rate of (13.99%) and (13.91%) respectively. The highest infection in cattle was recorded during autumn (22.20%) followed by spring (19.27%) then winter (10.05%), while the lowest (9.20%) prevalence was recorded during summer (Table I).

The prevalence of fasciolosis was higher in adult cattle (16.06%) than youngsters less than 2

years of age (9.90%). It was also noted that prevalence was higher (13.7%) in males than in females (12%) (Table II).

It was also noted that the highest prevalence (18.29 %) was recorded at Gujranwala followed by Lahore (16.41%), Sargodha (11.67%), Sheikhpura (10.62%), Jhang (8.67%) while the lowest (1.45%) at Faisalabad.

### DISCUSSION

The landscape of Punjab is amongst the most heavily irrigated on earth and canals can be found throughout the province. Besides that Punjab receives abundant rainfall.

Temperature and humidity are favourable for the growth and multiplication of *Fasciola* and snail so incidence is high during autumn followed by spring and lowest during summer. These findings are closely related to those of Soesety (1975); Cringoli *et al.* (2000); El-Shazly *et al.* (2002) and Pfukenyi and Mukaratirwa (2003).

Infection was the highest at Gujranwala followed by Lahore, Sargodha, Sheikhpura, Jhang while the lowest was at Faisalabad. This may be due to the fact that high level of infection was thought to be associated with the extension of the canal system providing additional areas of swamp and marsh where the cattle were exposed to infective larvae and metacercariae of helminths as was also noted by Mishra *et al.* (1997), Oyeduntan *et al.* (2008), (Arindam and Santra, 2009) and Nuraddis *et al.* (2010). They reported that the two most important factors influencing the incidence of fasciolosis are temperature and moisture, for they affect the hatching of fluke ova, the viability of encysting cercariae and population of snails (Walker *et al.*, 2008).

In the present study, majority of the slaughtered animals were harbouring mature flukes in their liver while in clinical ill animals the incidence of infection was based on identification of eggs in the faeces. Therefore, the recorded incidence of the infection was mainly due to mature parasites.

It was also noticed that during the year 1999 rains started during June changing environmental temperature and humidity, thus favouring the emergence of cercariae from snails. Due to this,

**Table I.- Seasonal prevalence (%) of fasciolosis in cattle.**

Places	Season wise Prevalence (%) of Fasciolosis				Overall
	Spring	Summer	Autumn	Winter	
Slaughter houses	691/3056 (22.67%)	142/1007 (14.1%)	219/522 (41.95)	183/1027 (17.8%)	691/3056 (22.6%)
Livestock farms	45/288 (19.73%)	61/443 (13.76%)	62/210 (29.52%)	56/399 (14.03%)	244/1280 (17.05%)
House hold	121/868 (13.99%)	118/1942 (6.07%)	118/901 (13.91%)	136/1906 (7.13%)	493/5617 (8.76%)
Veterinary hospitals	123/933 (13.3%)	166/1898 (8.74%)	176/956 (18.46%)	150/1892 (7.92%)	615/5679 (10.82%)
Overall	980/5085 (19.27%)	487/5290 (9.20%)	575/2589 (22.20%)	525/5224 (10.05%)	2043/15632 (13.06%)

**Table II.- Age wise & sex wise prevalence (%) fasciolosis in cattle.**

Factors	Slaughtered	Livestock farm	Household	Veterinary	Overall
<b>Age</b>					
Below 2 years	296/1627 (18.2%)	124/753 (16.46%)	154/2333 (6.6%)	210/3206 (6.55%)	784/7919 (9.90%)
Above 2 years	395/1429 (27.64%)	100/527 (18.98%)	339/3284 (10.32%)	405/2473 (16.37%)	1239/7713 (16.06%)
<b>Sex</b>					
Male	17320 (26.01%)	740 (20%)	2319 (8%)	3604 (10%)	8383 (13.7%)
Female	1336 (19%)	540 (14%)	3298 (9%)	2075 (12%)	7249 (12%)

metacercariae may show their existence in July after ingestion which produces fasciolosis with advancing age (Pfukenyi and Mukaratirwa, 2003). In the present study, higher infection rate was recorded in older animals as in other laboratories (Maqbool *et al.*, 1994; Mage *et al.*, 2004; Phiri *et al.*, 2005; Arindam and Santra, 2009). Though the explicit cause of the high incidence of the disease in adult animals can not be explained fully, it seems to be related to faulty management. It is also possible that the higher infection rate in older animals might have resulted due to relaxation of resistance because of environmental factors at parturition or during lactation. 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.*, 1994; Phiri *et al.*, 2005; Keyyu *et al.*, 2009).

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