

Retrospective Study of Fasciolosis in Slaughtered Sheep and Goats in Tirupati, Andhra Pradesh

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Abstract

This study was undertaken to derive the prevalence rate of fasciolosis disease in sheep and goats by collection of data regarding condemnation of liver samples due to fasciolosis from municipal slaughter house of Tirupati, over a period of one year from September 2012 to August 2013. During the study period a total of 35899 sheep and 25644 goats were slaughtered and 3278 (9.13%) and 2090 (8.15%) livers of sheep and goats respectively were condemned due to fasciolosis. Of the slaughtered sheep and goats a significantly ($p < 0.05$) higher prevalence of fasciolosis was recorded in sheep than in goats. Sex wise occurrence of fasciolosis in sheep and goats revealed that fasciolosis was significantly more prevalent in females than in males. Seasonal fluctuations were recorded on occurrence of liver fluke infection and highest percent of liver condemnations were observed during the rainy season followed by summer and winter. The overall high frequency of fasciolosis infection causes considerable economic losses and also poses a public health risk to meat consumers because of its zoonotic nature.

Keywords: Fasciolosis; Condemnation of Liver; Zoonotic Disease.

Introduction

The liver flukes are recognized as one of the most important trematode parasites that are being found in many parts of the world. *Fasciola spp.* has an indirect life cycle. Domestic and wild herbivorous mammals and humans act as definitive hosts and the freshwater gastropods of the family Lymnaeidae act as intermediate hosts (Soulsby E.J.L. 1986). The parasites cause considerable economic loss to livestock sector due to mortality, liver condemnation, reduced meat, milk, and wool production and expenditures on control and treatment of the disease.

Due to the increasing number of human cases, the liver flukes should be considered as an emerging public health concern (Nguyen *et al* 2005).

Food animals are rich source of high quality protein but on the other hand they serve as vehicles of disease transmission. The purpose of the present study was to investigate the occurrences and prevalence of Fasciolosis affecting the liver of slaughtered small ruminants in Tirupati during one year period.

Materials and Methods

The study was carried out to ascertain fasciolosis incidence in slaughtered sheep and goats based on data collected from municipal slaughter house in Tirupati. It is a retrospective survey done over a period of one year from September 2012 to August 2013. Daily condemnation records for sheep and goats in municipal slaughter house, Tirupati were

used. Every slaughtered animal is examined thoroughly and the reasons for the condemnation of organs including liver with flukes are recorded daily on prepared data sheets. Diagnosis of flukes is done macroscopically based on gross appearance (Soulsby E.J.L. 1986). The prevalence was collated on a sex and on seasonal bases. Analysis of data was done using Chi-square test.

Results

During one year period, 61543 animals were slaughtered in the study abattoir. The overall prevalence is recorded as 8.72 per cent. Incidence in sheep is 9.13 per cent followed by goats (8.15%). Sex and Seasonal variations based analysis in the occurrence of fasciolosis are summarized in the Table 2 & 3.

Table 1: Species wise prevalence of fasciolosis in slaughtered sheep and goats

Species	Total slaughtered	No. infected	Percentage
Sheep	35899	3278	9.13
Goat	25644	2090	8.15
Total	61543	5368	8.72

Table 2: Sex wise prevalence of fasciolosis in slaughtered sheep and goats

	Sheep		Goat		Total
	Male	Female	Male	Female	
No. slaughtered	19564	16335	13234	12410	61543
No. infected	1741	1537	992	1098	5368
Percentage	8.89	9.40	7.49	8.84	8.72

Table 3: Season wise prevalence of fasciolosis in slaughtered sheep and goats

	Winter (Nov-Feb)		Summer (March-June)		Rainy (July-Oct)		Total
	sheep	goat	sheep	goat	sheep	goat	
No. slaughtered	15192	9951	10886	6883	9821	8810	61543
No. infected	1001	782	916	543	1361	765	5368
Percentage	6.58	7.85	8.41	7.88	13.85	8.68	8.72

Discussion

In the current study, the prevalence of *Fasciola* spp. in sheep and goats was 9.13% and 8.15% respectively. Sreedevi *et al* found *fasciola* infection in buffaloes in and around Tirupati which also indicates that the *fasciola* infection in sheep goat is due to mixed grazing of small ruminants along with large ruminants. Similarly Singh, R. *et al* reported 6.40 percent in goats in Ranchi, Bihar.

In a study in 2004 at Amol city abattoir, Iran, fasciolosis rate was 5.8% for sheep and 0.5% for goats (Moghaddam *et al*). On the other hand, Oryan *et al*. in 2011 reported that the infection rate due to *Fasciola* spp. was 0.35% in the sheep and 0.2% in the goats in Northeastern Iran (Oryan *et al*). As with the development of the intermediate host, temperature (>9.5 °C), rainfall and soil moisture are important factors influencing the development of the parasite from egg to miracidium. With regard to host species, fasciolosis was significantly more prevalent in sheep than goats. Both sheep and goats are susceptible and have no resistance to re-infection (Issia *et al*). Higher prevalence in sheep may be due to the ground grazing habits of the species. Goats graze on leaves and branches on bushes and trees

but sheep graze on plants on the ground where metacercariae are mostly found. So, the possibility of infection with metacercariae is higher in sheep than goats (Theodoropoulos *et al* 2011). However, *fasciolosis* was significantly more prevalent in female animals. It is assumed that sex is a determinant influencing prevalence of parasitism and females are more prone to infections during pregnancy and peri-parturient period due to stress and decreased immune status (Khan *et al*, 2014).

The prevalence of *Fasciola* spp. showed significant seasonal differences in this study. The hatching of fluke eggs and the multiplication of the snail intermediate host require high rainfall and temperatures (>10 °C) (Taylor *et al* 2012). These conditions generally occur in the rainy season, when many fluke eggs hatch, snails multiply and then cercariae develop and are released on wet pastures before encysting onto herbage. The seasonality pattern in fasciolosis prevalence has been also observed by other investigators (Ali *et al* 2011). Temperature, rainfall and soil moisture influence the activity and abundance of the intermediate hosts of *Fasciola* spp. The lowest prevalence was observed during winter season. It probably indicates that the infective stages (cercaria, metacercaria, infection) die

at lowest temperature. While in Kashmir, prevalence of fascioliasis is found to be fairly high about 54 per cent during winter and lowest (33 per cent) during summer (Singh, B.P. 2001). This difference indicates the adaptability according to the climatic conditions existing in different geographical areas

The slaughter house survey reflected the disease situation in and around Tirupati region and it concludes that the region is considered as endemic for *Fasciola spp.* As the disease is having zoonotic significance besides harming the livestock community there is a need to focus on problems concerning meat hygiene and possible health risks to the consumers. In this context, meat-inspection data are a potential source of information and have an important role to play in epidemiology and preventive veterinary medicine (Gracey *et al.*, 1999). More surveys are suggested to be carried out including all regions of Andhra Pradesh, and the data is used in developing a prediction model to combat the infection in small ruminants. Based on the results on the prevalence of fasciolosis in sheep and goats, it is obligatory to follow integrated strategies and measures to control fasciolosis infections in sheep and goats in and around Tirupati.

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