

Prevalence of *Dicrocoelium dendriticum* Infection in Cattle, Sheep and Goat in Gilan Province, Northern Iran

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Abstract: *Dicrocoelium dendriticum* is common parasites of herbivores in many parts of Iran. In chronic infections, this parasite causes biliary cirrhosis in liver of cattle, sheep or goat and lead to economic losses. The main aim of this study was to determine the prevalence of *Dicrocoelium dendriticum* in cattle, sheep and goat in Northern Areas of Iran, Gilan Province. This cross-sectional survey was carried out in the slaughterhouses of different localities in eastern and western areas of Gilan province. About 200 cattle, sheep and goat livers were examined. The prevalence of liver infection was 85, 66 and 23.25% in sheep, cattle and goats, respectively. There was significant difference between animals liver infection ($p < 0.001$). Western Gilan showed more prevalence of *Dicrocoelium* infection as compared with eastern Gilan ($p < 0.01$).

Key words: *Dicrocoelium dendriticum*, prevalence, cattle, sheep, goat, chronic infections

INTRODUCTION

Dicrocoelium dendriticum is a common parasite of herbivores in many parts of the world (Soulsby, 1982) particularly in most countries of the Middle East (Daryani *et al.*, 2006; Gargil *et al.*, 1999). In chronic infections, this parasite causes biliary cirrhosis in liver of cattle, sheep or goats and lead to economic losses (Dunna, 1978). *D. dendriticum* spends its adult life inside the liver of its host. After mating, the eggs are excreted in the feces. The first intermediate host is terrestrial snail and the second is an ant. In ruminants the liver is damaged and the subclinical and chronic disease usually results in decreased production of meat, milk and wool. There are also secondary bacterial infections, fertility problems and great expenses with anthelmithics (Eslami, 1979). Because of insufficient data on *Dicrocoelium* infection particularly seasonal fluctuation of infection in livestock in northern Iran, this study was exerted to investigate the prevalence of *Dicrocoelium* infection in slaughtered cattle, sheep and goats in Gilan Province, Northern Iran.

MATERIALS AND METHODS

This cross-sectional survey was carried out in the slaughter houses of different localities in eastern and western areas of Gilan Province. Slaughter houses were paid weekly visits between 22.06.2006 and 22.12.2006 and the livers of slaughtered cattle, sheep and goats were

examined. Age of animals was recorded as. About 200 livers of each cattle, sheep and goats group were examined. Livers were examined according to the method described by Ogambo-Ongoma (1972) and the parasites were identified by the morphological characteristics (Soulsby, 1982). The total infection rate in different animals was calculated. To determine the difference between distribution of infection rate in animals and season or locality, statistical analysis was performed using chi-square test and SPSS 11 software to show the effects of seasons and locality on liver infection in animals.

RESULTS AND DISCUSSION

Among 200 livers of sheep, cattle and goats, 85, 66 and 23.25% were found positive for *Dicrocoelium*, respectively. There was highly significant difference in *Dicrocoelium* infection between cattle, sheep and goats. Infection of goats was considerably lower than sheep or cattle ($p < 0.001$). Cattle infection was more in summer compared with autumn ($p < 0.01$) but there was not significant seasonal fluctuation in sheep or goats infection in eastern or western Gilan (Table 1 and 2). Western Gilan showed 4-5% more prevalence of *Dicrocoelium* infection than eastern Gilan ($p < 0.01$). As we have shown there was a high prevalence of sheep, cattle and goats liver *Dicrocoelium* infection in northern of Iran. This finding is in accordance with the other findings which have shown that *Dicrocoelium* infection is

Table 1: Prevalence of *D. dendriticum* infection in animals slaughtered in eastern Gilan, Northern Iran

Animals	No. of examined animals (per season)	Animals infected with <i>Dicrocoelium</i> (%)	
		Summer	Autumn
Cattle	100	61	67
Sheep	100	82	83
Goat	100	20	22

Table 2: Prevalence of *D. dendriticum* infection in animals slaughtered in western Gilan, Northern Iran

Animals	No. of examined animals (per season)	Animals infected with <i>Dicrocoelium</i> (%)	
		Summer	Autumn
Cattle	100	65	71
Sheep	100	87	88
Goat	100	25	26

common in many areas of Iran (Daryani *et al.*, 2006; Ansari-Lari and Moazzeni, 2006; Eslami *et al.*, 1981) and other countries (Gargil *et al.*, 1999; Dhar *et al.*, 1982; Goater and Colwell, 2007; Torina *et al.*, 2004; Yadev and Tandon, 1989). In contrast to studies in northwestern of Iran that have shown the existing of highest rate of *Dicrocoelium* infection in cattle or goats (Daryani *et al.*, 2006); the findings indicate that the highest rate of *Dicrocoelium* infection occurs in sheep in northern Iran.

It may come from differences in animals food habits, environment or innate immunity. Based on the findings, there was a seasonal fluctuation of *Dicrocoelium* infection for cattle (and not for sheep or goats). Existing of seasonal pattern of *Dicrocoelium* infection has also been indicated in many areas of the world (Sissay *et al.*, 2007). On the other hand, there is not simple justification for consistent prevalence of *Dicrocoelium* infection in summer and autumn in sheep or goats however, it may arise from different pattern of infection among cattle and sheep or goats. Prevalence of *Dicrocoelium* infection rate was also higher in western than eastern areas of northern Iran. This may come from natural and environmental differences between these two parts of country.

CONCLUSION

High prevalence of sheep, cattle and goats liver *Dicrocoelium* infection in northern of Iran can result in decreased production of meat, milk and wool, secondary bacterial infections and fertility problems; therefore it is necessary to carry out further etiologic and epidemiologic studies to find the ways to battle against *Dicrocoelium* infection in northern of Iran.

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REFERENCES

Ansari-Lari, M. and M. Moazzeni, 2006. A retrospective survey of liver fluke disease in livestock based on abattoir data in Shiraz, South of Iran. *Prev. Vet. Med.*, 73: 93-96.

Daryani, A., H. Ziaei, M. Sharif, M.H. Dehghan, R. Alaei and R. Arab, 2006. Prevalence of liver fluke infections in slaughtered animals in Ardabil province, Northwestern Iran. *J. Anim. Vet. Adv.*, 5: 408-411.

Dhar, D.N., R.L. Sharma and G.C. Bansal, 1982. Gastro-intestinal nematodes in sheep in Kashmir. *Vet. Parasitol.*, 11: 271-277.

Dunna, A.M., 1978. *Veterinary: Helminthology*. 2nd Edn., William Heinemann Med. Books Ltd., UK.

Eslami, A., 1979. *Veterinary Helminthology Trematoda*. Tehran University Publication, Tehran, pp: 29-30.

Eslami, A., S. Rahbari and M. Meydani, 1981. Cestodes and trematodes of wild sheep, ovis, Ammon orientalis and goitered gazelle, *Gazella subgutturosa* in Iran. *Vet. Parasitol.*, 8: 99-101.

Gargil, A., E. Tuzer, A. Gulanber, M. Toparlak, L. Efil and M. Ulutas, 1999. Prevalence of liver fluke infections in slaughtered animals in trakya (Thrace), Turkey. *Turk. J. Vet. Anim. Sci.*, 23: 115-116.

Goater, C.P. and D.D. Colwell, 2007. Epidemiological characteristics of an invading parasite: *Dicrocoelium dendriticum* in sympatric wapiti and beef cattle in Southern Alberta, Canada. *J. Parasitol.*, 93: 491-494.

Ogambo-Ongoma, A.H., 1972. Fasciolosis survey in Uganda. *Bull. Epizoot. Dis. Afr.*, 20: 35-41.

Sissay, M.M., A. Uggla and P.J. Waller, 2007. Prevalence and seasonal incidence of nematode parasites and fluke infections of sheep and goats in eastern Ethiopia. *Trop Anim. Health Prod.*, 39: 521-531.

Soulsby, E.J.L., 1982. *Helminth, Arthropods and Protozoa of Domesticated Animals*. 7th Edn., ELBS and Bailliere Tindall, London, pp: 809.

Torina, A., S. Dara, A.M.F. Marino, O.A.E. Sparagano, F. Vitale, S. Reale and S. Caracappa, 2004. Study of gastrointestinal nematodes in sicilian sheep and goats. *Ann. N.Y. Acad. Sci.*, 1026: 187-194.

Yadev, A.K. and V. Tandon, 1989. Gastro-intestinal nematode infections of goats in a sub-tropical and humid zone of India. *Vet. Parasitol.*, 33: 135-142.