

ORIGINAL ARTICLE

Prevalence of *Coenurus cerebralis* in sheep in Northwest of Iran

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Abstract

This survey was carried out to determine the infection rate of *Coenurus cerebralis* in Urmia abattoir, West Azerbaijan, Iran. A total of 402 sheep heads were examined and the number of *C. cerebralis* cysts per each head was recorded. Thirty three sheep heads were examined each month during 12 months from 2006 to 2007. Of 402 heads, a number of 75 heads (18.65%) were infected with *C. cerebralis*. The cysts located in the left and right hemispheres and cerebellum were 54.63%, 40.20% and 5.15%, respectively. The infected heads contained 1-4 cysts. The highest and lowest prevalence were detected in sheep in March (42.42%) and in July (2.94%), respectively. The infection rates according to age of sheep were 42.02% in 0.5 to 2 years, 22.50% in 2 to 4 years and 8.92% in older than 4 years. The age specific infection rates among age groups were significantly differed ($P < 0.05$). Infection rate in Haraki breed (27.77%) was higher comparing to the rate in the Ghezel breed (21.13%) and Makoie breed (23.91%). However differences between sheep breeds were not statistically significant ($P > 0.05$).

Introduction

Coenurus cerebralis, the metacestode or larval form of the dog tapeworm *Taenia multiceps*, causes coenurosis, otherwise known as gid or stagger. *C. cerebralis* causes a serious problem in sheep production.¹ The larval stage (metacestode or *Coenurus*) of this cestode, known as *C. cerebralis*, affects the central nervous system (CNS), particularly the brain of sheep and gives rise to the neurological signs of coenurosis (gid or stagger) that in the majority of causes result in the death of the animal from starvation after some weeks.^{2,3}

In studies carried out in Iran, *Coenurus* has been reported in sheep,^{4,5} goats^{6,7} and in a wild sheep.⁸ The prevalence of *C. cerebralis* in sheep was found to be 3% in Jordan,⁹ 1.3–36.8% in Turkey¹⁰⁻¹² and 2.88% in India.¹³ Abo-Shehada *et al.*, (2002)⁹ have reported that these parasites are frequently seen during the winter season in sheep in Jordan. In this study, prevalence, localization, size, number of *C. cerebralis* in Urmia city and the effect of age, breed and season on the evolution of the parasite were investigated.

Materials and Methods

From 2006 to 2007, every month 33 heads were randomly

chosen from the sheep at the Urmia slaughterhouse and examined for the presence of *C. cerebralis*. Age and breed of each animal was determined. The heads cut in the slaughterhouse were opened by electrical saw and the brains were examined. The brains were sliced and checked for the presence, size, number and localization of cyst. Detected cysts and the brain were kept in 70% alcohol. The chi-square test was applied for comparison of age and breed groups.

Results

Seventy five (18.65%) of the examined brains were found infected with *C. cerebralis*. Totally 97 cysts were observed in infected heads. The means of cysts was 1-4 cysts. Diameters of cysts were ranged from 1 to 4.5 cm. The results indicated that 45, 13, 6 and 2 sheep infected to 1, 2, 3 and 4 cyst, respectively. The results also showed that 54.63%, 40.20% and 5.15% of larvae were detected in left hemisphere, right hemisphere and cerebellum, respectively (Fig 1). The higher and lower infection of *C. cerebralis* were seen in March (42.42%) and in July (2.94%), respectively ($P > 0.05$) (Fig 2). There was no difference between prevalence

of infection and season ($P > 0.05$). The infection rates according to age of sheep were 42.02% in 0.5 to 2 years, 22.50% in 2 to 4 years and 8.92% in older than 4 years. The age specific infection rates among age groups were significantly differed ($P < 0.05$) (Table1). The rate of infection in different sheep breed was 27.77% for Haraki, 23.91% for Makoie and 21.13% for Ghezel ($P > 0.05$) (Table1).

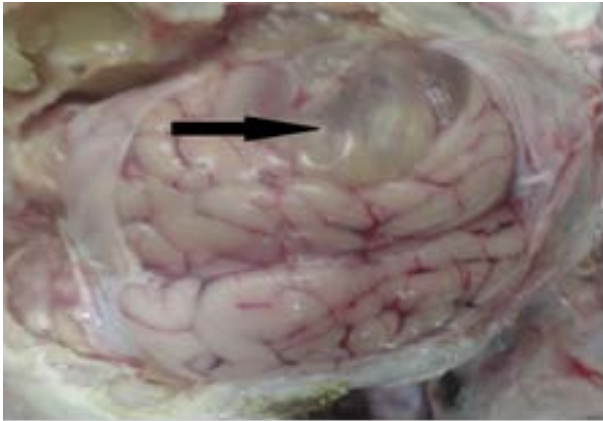


Fig 1. Coenurus cyst on the left cerebral hemisphere in 2 year old Ghezel breed sheep.

Discussion

Prevalence of *C. cerebralis* in present investigation was 18.65%. In other studies carried out in Iran, the prevalence rate varied from 0.32-9.8%.^{4,5,6,7} In several countries, the prevalence of larvae were found to be 3% in Jordan,⁹ 4.5% in Ethiopia,¹ 2.88% in India¹³ and 1.3-36.8% in Turkey.^{10,11,12}

In this survey the great majority of cysts were located in the cerebral hemisphere (5.15%), 54.63% in the left and 40.20% in the right one. These results were similar to the results from Jordan,⁹ Turkey,¹² Ethiopia¹ and Italy.¹⁶

In our study, the highest and lowest prevalence were in March (42.42%) and in July (2.94%), respectively. In Jordan and Turkey, the infections were found mostly during the winter season and the least in summer.^{9, 15} In other study in Italy the highest prevalence of infection was found from March to July.¹⁶

In this survey the great majority of cysts were located in the cerebral hemisphere (5.15%), 54.63% in the left and



Fig 2. Monthly prevalence of *Coenurus cerebralis* in sheep.

40.20% in the right one. These results were similar to the results from Jordan,⁹ Turkey,¹² Ethiopia¹ and Italy.¹⁶

In our study, the highest and lowest prevalence were in March (42.42%) and in July (2.94%), respectively. In Jordan and Turkey, the infections were found mostly during the winter season and the least in summer.^{9, 15} In other study in Italy the highest prevalence of infection was found from March to July.¹⁶

In our study, cyst sizes were between 1-4.5 cm. Biyikoglu and Doganay (1998) reported that the cyst sizes were between 0.3-4.2 cm.¹¹ Achenef *et al.*, (1999) reported the cysts sizes were between 0.8-6.5 cm.¹ Necrosis and calcification of cysts were reported in some studies¹¹ but those finding were not observed in our study.

In conclusion, coenuruses is an important disease in young sheep of the region. Therefore, to prevent sheep from this parasite, effective control measures must be taken, such as prohibition of illegal slaughtering, and public awareness of the epidemiology of the *C. cerebralis*. Dogs should be prevented from feeding on sheep heads and medicated with efficient drug.

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Table 1. Infection rates to *Coenurus cerebralis* according to age and breed.

	Age (years)			Breed			Total
	0.5-2	2-4	>4	Haraki	Ghezel	Makoie	
Number of examined sheep	69	120	213	162	194	46	402
Infected sheep (%)	29(42.02%)	27(22.5%)	19(8.92%)	45(27.77%)	41(21.13%)	11(23.91%)	75(18.65%)

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