Journal of Novel Applied Sciences
Available online at www.jnasci.org
©2013 JNAS Journal-2013-2-12/710-712
ISSN 2322-5149 ©2013 JNAS

An Abattoir Survey of Liver and Lung hydatidosis in Northwest Iran

Mehdi Taghavi[1], Mohammad Mirzaei[2*] and Majid Fartashvand[3]

1- Young Researchers And Elite Club, Tabriz Branch, Islamic Azad University, Tabriz, Iran
2- Department of Pathobiology, School of Veterinary Medicine, Shahid Bahonar University of Kerman, Kerman, Iran
3- Department of Animal Science, Faculty of Veterinary Medicine, Tabriz Branch, Islamic Azad University, Tabriz, Iran

***Corresponding author*:** Mohammad Mirzaei

ABSTRACT: The livers and lungs of 730 cattle slaughtered at abattoir in Urmia between July and October 2012 were examined in routine meat inspection procedures for liver and lung hydatidosis. The infection rate of hydatidosis in cattle was 14.93%. The cysts were found in 8.67% of 366 cattle (<2 year old), in 15.92% of 245 cattle (between 2-4 years old) and in 26.05% of 119 cattle (between 4-6 years old). The infection rate was 16.89% in female cattle and 13.55% in male cattle. Out of the infected cattle, 79.82% had cysts in the lungs, 36.70% in the liver and 16.51% both in liver and lung. The maximum of cysts in the infected lungs and livers was respectively 69 and 33. The minimum of cysts in lungs and livers was 1. Besides, the means of cysts in the infected lungs and livers were respectively 6.10 and 2.43. Considering the prevalence rate, the results obtained from the statistical analysis did not show any significant difference in male and female sexes ($p>0.05$). However, a significant statistical relation was observed between the age of cattle and the prevalence rate ($p<0.05$) and the age between 4-6 years old showed the highest level of prevalence rate.

***Keywords*:** hydatid cysts, prevalence, cattle, Urmia, Iran.

INTRODUCTION

Hydatid disease is regarded as a major endemic zoonotic disease in Iran (Dalimi et al., 2002; Daryani et al., 2007; Fakhar and Sadjjadi, 2007; Mamishi et al., 2007). Hydatidosis is a term used to describe infection of animals with metacestode stage of echinococcus species, hydatid cyst (Eckert and Deplazes, 2004). The distribution of *E. granulosus* is higher in developing countries especially in rural communities where there is close contact between the dog, the definitive host, and various domestic animals, which may act as intermediate hosts (Eckert and Deplazes, 2004). Echinococcosis is one of the major zoonotic parasitic diseases in the Middle East. Both cystic and alveolar echinococcosis has been reported from this area. However, cystic echinococcosis is more prevalent and has been reported from all countries in the Middle East. *E. granulosus* is highly prevalent in Iran (Dalimi et al., 2002). The outcome of infection in livestock is hydatid cyst development in the lung, liver or other organs (Eckert and Deplazes, 2004; Jenkins et al., 2005). Hydatid cyst has been studied in different aspects during last two decades in Iran and reported from the most areas of the country (Ansari-Lari, 2005). The presence of large stray dog population are thought to contribute significantly to the prevalence of the disease in Iran. Hence, it is essential to obtain baseline data concerning prevalence of the disease before contemplating any rational control programs. Therefore, the aim of this study was to determine the magnitude of the disease in cattle and to study the localization of hydatid cysts in Urmia Abattoir, northwestern Iran.

MATERIALS AND METHODS

A cross sectional study type was conducted to determine the prevalence rate of liver and lung hydatidosis in the cattle in Urmia, Iran by using post-mortem examination of liver and lung of each slaughtered animal. This study was carried out between July and October 2012 at abattoir in Urmia city. In the study, 730 heads of cattle (428 males and 302 females) provided for slaughter from different localities in the northwestern part of Iran were included. The information including age and sex of animals were recorded. Lungs and livers were inspected in routine meat inspection procedures for the presence and number of hydatid cyst. Prevalence of hydatid cyst was calculated as the number of cattle found to be infected, expressed as a percentage of the total number of cattle slaughtered. The data were analyzed using chi-squared and Fisher's exact tests (SPSS 11.5). The p value less than 0.05 was considered as significant.

RESULTS AND DISCUSSION

Results

The table summarizes the results of the present study. Of the 730 animals examined, 109 (14.93%) were found harboring hydatid cyst. The cysts were found in 8.67% of 366 cattle (<2 year old), in 15.92% of 245 cattle (between 2-4 years old) and in 26.05% of 119 cattle (between 4-6 years old). The infection rate was 16.89% in female cattle and 13.55% in male cattle. Out of the infected cattle, 79.82% had cysts in the lungs, 36.70% in the liver and 16.51% both in liver and lungs. The maximum of cysts in the infected lungs and livers was respectively 69 and 33. The minimum of cysts in lungs and livers was 1. Besides, the means of cysts in the infected lungs and livers were respectively 6.10 and 2.43. Considering the prevalence rate, the results obtained from the statistical analysis did not show any significant difference in male and female sexes ($p>0.05$). However, a significant statistical relation was observed between the age of cattle and the prevalence rate ($p<0.05$) and the age between 4-6 years old showed the highest level of prevalence rate.

Table 1. The prevalence of liver and lung hydatidosis in slaughtered cattle in Urmia

	Age								
	<2		2-4		4-6		Total		Total
	male	female	male	female	male	female	male	female	cattle
Slaughtered cattle	227	139	165	80	36	83	428	302	730
Infected to hydatid cyst (Prevalence)	21 (9.25)	18 (12.95)	25 (15.15)	14 (17.5)	12 (33.33)	19 (22.89)	58 (13.55)	51 (16.89)	109 (14.93)
Infected lungs to hydatid cyst (Prevalence)	18 (7.93)	14 (0.07)	21 (12.73)	11 (13.75)	8 (22.22)	15 (18.07)	47 (10.98)	40 (13.25)	87 (11.92)
Infected livers to hydatid cyst (Prevalence)	5 (2.2)	7 (5.04)	9 (5.45)	7 (8.75)	7 (19.44)	5 (6.02)	21 (4.91)	19 (6.29)	40 (5.48)
Infected both liver and lung to hydatid cyst (Prevalence)	2 (0.88)	3 (2.16)	5 (3.03)	4 (5.0)	3 (8.33)	1 (1.2)	10 (2.34)	8 (2.65)	18 (2.47)

Discussion

Cattle may be exposed to or infected by many diseases throughout their lives. Slaughterhouse studies are a valuable source of information for veterinary researchers, particularly in subclinical diseases such as hydatidosis (Al-Yaman et al., 1985; Ansari-Lari, 2005; Eckert and Deplazes, 2004). Hydatidosis is very important for economical losses and human life. Hydatid disease has been recognized as the most important helminth zoonoses and of great economic and public health significance in developing countries (Ansari-Lari, 2005; Arinc et al., 2008; Gauci et al., 2005). Hydatidosis is considered to have an endemic steady state in Iran (Ahmadi, 2005; Ansari-Lari, 2005; Dalimi et al., 2002; Daryani et al., 2007; Eckert and Deplazes, 2004) and previous studies showed prevalence of 16.4% (Dalimi et al., 2002) and 38.3% (Daryani et al., 2007) among cattle. In a 2005 survey in Turkey, 14.16% of the cattle slaughtered were infected by hydatid cysts. Among the infected cattle, the infection rate in lung and liver was 49.16% and 16.68% respectively. The infection rate both in lung and liver was 34.16%. In the survey mentioned, the range of cyst number was 1 to 34 with a mean of 8.13 (Yildiz and Tunçer, 2005). In this report, 14.93% of cattle examined were infected with hydatid cyst, near to the range of previous reports.

The results obtained in present survey are in accordance with the findings of most researchers. Considering the prevalence rate, the present study does not show any significant difference between males and females. While

there was a significant statistical relation between the age of cattle and prevalence rate, and prevalence rate was mostly seen in the age group between 4-6 years old. In a 2006 research in Morocco, the prevalence rate of hydatid cyst in domestic ruminants being more than five years old was considerably more than the other age groups (Azlaf and Dakkak, 2006).

The high infection prevalence of hydatid cyst in domestic ruminants as well as stray dogs infection caused by *E. granulosus* indicates the vital importance of hydatidosis. The studies show that through two recent decades in Iran, the average of infection rate of dogs to *E. granulosus* has been 32.7% (Yousofi, 2008). Furthermore, wild carnivores, just like dogs play an important role in epidemiology of hydatid cyst. That is because the pastures infected by feces of infected wild carnivores causes the transmission of infection to the domestic ruminants (Bowman and Georgi, 2009). Through a 3-year study in five western provinces in Iran, the infection rate of *E. granulosus* in golden jackal and red fox was reported 2.3% and 5% respectively (Dalimi et al., 2002).

Both the results of the present study and previous ones show the continuation of infection in Iran. Thus, some preventive acts should be done to decrease the infection rate of dogs to the adult parasite or larva in domestic ruminants. As it is difficult to diagnose the infection of dogs, the prevention of close presence of ruminants and dogs is one of the most important ways to control the infection (Eslami, 1997). So, it is necessary to promote the cultural and informative level of animal-breeders and changing the traditional technique of animal-breeding. Lowering the age of the animal slaughtered results in keeping the cysts at the minimum level leading to the reduction of infection in dogs eating infected organs. Slaughtering in hygienic and standard slaughterhouses, keeping the dogs away from nearby slaughterhouses, hygienic destruction of condemned organs in slaughterhouses as well as no home slaughtering are influential to control hydatid cyst (Eslami, 1997). Destruction of all stray dogs and regimented anthelmintic medication of the rest are considered as the essential approaches to campaign the infection of this parasite (Bowman and Georgi, 2009; Urquhart, et al.). So, the increasingly control of public health organizations is a necessity.

REFERENCES

Ahmadi N. 2005. Hydatidosis in camels (Camelus dromedarius) and their potential role in the epidemiology of Echinococcus granulosus in Iran. J Helminthol; 79(2): 119-125.

Al-Yaman F. 1985. Prevalence of hydatidosis in slaughtered animals from North Jordan. Ann Trop Med Parasitol; 79(5): 501-506.

Ansari-Lari M. 2005. A retrospective survey of hydatidosis in livestock in Shiraz, Iran, based on abattoir data during 1999-2004. Vet Parasitol; 133(1): 119-123.

Arinc S. 2008. Recurrent pulmonary hydatid disease: analysis of ten cases. Surg Today; 38(11): 983-986.

Azlaf R and Dakkak A. 2006. Epidemiological study of the cystic echinococcosis in Morocco. Vet parasitol; 137(1-2): 83.

Bowman DD and Georgi JR. 2009. Georgis' parasitology for veterinarians: Saunders.

Dalimi A.2002. Echinococcosis/hydatidosis in western Iran. Vet Parasitol; 105(2): 161-171.

Daryani A. 2007. The prevalence, intensity and viability of hydatid cysts in slaughtered animals in the Ardabil province of Northwest Iran. J Helminthol; 81(1): 13-17.

Eckert J and Deplazes P. 2004. Biological, epidemiological, and clinical aspects of echinococcosis, a zoonosis of increasing concern. Clin Microbiol Rev; 17(1): 107-135.

Eslami A. 1997. Veterinary helminthology. in Vol (2).

Fakhar M and Sadjjadi S. 2007. Prevalence of hydatidosis in slaughtered herbivores in Qom Province, Central Part of Iran. Vet Res Commun; 31(8): 993-997.

Gauci C. 2005. Hydatid disease: vaccinology and development of the EG95 recombinant vaccine. Expert Rev Vaccines; 4(1): 103-112.

Jenkins D, Romig T and Thompson R. 2005. Emergence/re-emergence of Echinococcus spp.—a global update. Int J Parasitol; 35(11-12): 1205-1219.

Mamishi S, Sagheb S and Pourakbari B. 2007. Hydatid disease in Iranian children. J Microbiol Immunol Infect; 40(5): 428-431.

Urquhart G. 1987. Veterinary Parasitology 1987: Longman Scientific and Technical.

Yildiz K and Tunçer C. 2005. Prevalence of hydatid cysts in cattle in the province of Kirikkale. Türkiye Parazitol Dernğ; 29(4): 247.

Yousofi H. 2008. Situation of hydatid cyst infection during last two decades (1985-2005) in Iran. J Shahrekord Univ Med Sci; 10: 78-88.