

## Original Article

**Prevalence of Hydatidosis in slaughtered herbivores in Khomein, Markazi province, Central Part of Iran**Mehdi Pareviz<sup>1</sup> Mohammad Rezaei<sup>2</sup> Nabi Shariatifar<sup>3</sup> \*Hessam Akberin<sup>4</sup> Gholam Reza Jahed Khaniki<sup>5</sup> Issa Mohammadpour<sup>6</sup>

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**Abstract**

**Background and purpose:** Hydatidosis is one of the most important zoonoses in the world that have public health and economic perspectives. The aim of this study was to investigate the prevalence of hydatid cysts in slaughtered animals in the industrial slaughterhouse of Khomein, Markazi province (2007-2011).

**Materials and Methods:** In this study was investigated 28760 head of animals, including; 12860 sheep, 3840 cows and 12060 goats. Their carcasses were inspected using macroscopic method for hydatid cyst in livers and lungs. Data analysis was performed by Chi-square test and SPSS software (Version 16.0).

**Results:** The prevalence frequency of hydatidosis in slaughtered cattle was 523 head with the most infected animals of 113(2.94%) cow, 223(1.73%) sheep and 187 (1.55%) goats respectively. Moreover, 1126(3.9%) infected lungs and 1076(3074%) infected livers were found. On the seasonal bases, the surveys showed that maximum spread of the disease was in summer.

**Conclusion:** The prevalence of hydatid cysts of parasites is relatively high which in addition to imposing high economic losses due to the deleting of infested organs of animals and decrease in livestock products, indicates the existence of conditions for health risks for residents which requires more inclusive and comprehensive sanitary and control measures due to this parasite's life cycle and transmission. [Pareviz M. Rezaei M. Shariatifar N. \*Akberin H. Gahed Gh. Mohammadpour I. **The Prevalence of Hydatidosis in slaughtered animals of the industrial slaughterhouse of Khomein, Iran (2007-2011).** *IJHS* 2013; 1(2):83-88] <http://jhs.mazums.ac.ir>

**Key words:** Zoonoses, Hydatid cyst, Meat hygiene, Slaughtered animals.

## 1. Introduction

As the population grows, demands for high quality and healthy protein sources increase. Totally, 77250000 head of sheep and goats and 8588000 head of cows are raised in Iran (1). These folks of farm livestock are the main protein source for the society. In spite of qualitative and quantitative improvement of health and disease prevention measures, there is still a great deal of financial loss sustained all around the world due to parasite caused diseases transmittable by food. Estimates show that the figure of losses hit a considerable amount annually. The losses are comprised of costs to diseases treatment, and prevention spread of diseases, economic losses due to increase in mortality rate of livestock, measures to dispose of livestock corps, and loss of profit (2, 3). Hydatidosis and hydatid cyst is one of many health threats, in developing countries in particular, that causes many economic losses. The disease is spread by echinococcus granulosus cyst. hydatid cyst that causes among human is rampant in Iran(4, 5). The problem challenges not only the developing countries but the rural areas in developed countries are also threatened by. The disease is widespread in China, Vietnam, Cambodia, Taiwan, Philippine, Nepal, Indonesia, India, Pakistan, Iran, Iraq, Jordan, and parts of Kuwait and The Saudi Arabia. echinococcus is endemic in Iran. Recent increase in Afghan refugees has caused increase in spread of the disease to a great extent. A large number of yellow jackal and red fox in northern regions of Iran that usually eat up the remaining parts of non-standard slaughtered livestock in rural areas is

threatened by the disease. (6-8). hydatidosis endemic or hyper-endemic in Iran (9, 10). There are cases of echinococcus pandemics with considerable economic losses. Usually, the infection in livestock results is considerable decrease of dairy, meat, and wool production. Ticks and herds of livestock play an important role in spreading the disease, while wild species such as yellow jackal and red fox in some parts of the country contribute in spreading the disease(11). The only cure for human is to amputate the infected limb through surgery and use of anti-parasite medication depending on size of the larva. On the other hand, there is threat that remaining of cyst or Ruptured cyst and discharge of protoscolex may end up in numerous secondary cysts in different body organs (12). Clinical symptoms of hydatidosis in livestock's depend on number, size, and spot of the cysts. The symptoms in the sheep are trivial as they are raised for economic reason and slaughtered before the symptoms can develop (5, 13). Development of the cyst in liver and lungs usually causes no symptoms and the cases might be determined during inspections in slaughterhouse. Acute cases are featured with liver disorder, anorexia, diarrhea, edema, anemia, icterus, emphysema, and hepatosplenomegaly (5, 14-18). The cyst is commonly found in liver and lungs among the sheep. Among the cow, and the horse it is found in liver in 90% of the cases (19). Studies on the sheep showed that 6.6% (Isfahan), 4.39% (Khorasan), 19.93% (Urmia), and 9.9% (Kashan) of the sheep brought in slaughterhouses were infected with

the parasite (20). Public health concerns are important as are economic concerns regarding damages caused by the parasite (3). The present study is aimed to determine spread of the contamination with hydatid cyst in farms of Khomein City and limbs of the livestock body that are the first and last targets of the disease. The results may help the officials to take more proper preventive measures.

## 2. Materials and Methods

The study was conducted as descriptive and cross-sectional study with a statistic society of body limbs of slaughtered livestock in industrial slaughterhouse of Khomein city between 2007 and 2010. Sampling was conducted randomly and attending the site. According to the data, about 20 heads were slaughtered per day during a four years period, which comes of 28760 heads of livestock (44.71% sheep, 13.35% cow, 41.9%

goat). Thus, 12860 heads of sheep, 3840 heads of cow, and 12060 heads of goats were adopted. The study used direct observations so that samples were examined by appearance and cuts were studied if required at site. To test contamination with the cyst, appearance of liver and lungs were examined. The data were analyzed in SPSS ver. 16 using descriptive statistics.

## 3. Results

The results showed 523 cases of infection with hydatid cyst, so that the Cow with 113(2.94%) contaminated cases were at top, followed by sheep with 223(1.73%) and goats with 187(1.55%) cases. Moreover, 1126(3.9%) infected lungs and 1076(3074%) infected livers were found (Table 1). On the seasonal bases, the surveys showed that maximum spread of the disease was in summer (Table 2).

**Table1.** Frequency of liver, lung and simultaneously infection in slaughtered livestock

Livestock	Slaughtered	Frequency of infected liver	%	Frequency of infected lungs	%	Frequency of infected liver & lung	%
Sheep	12860	495	3.85	515	4	223	1.73
Goat	12060	388	3.2	403	3.34	187	1.55
Cow	3840	193	5.02	208	5.41	113	2.94

**Table2.** seasonal frequency of the infection

Season	Organs	Livestock			Total
		Sheep	Goat	Cow	
<b>Spring</b>	Liver	113	83	40	236
	Lung	48	89	96	303
	Total	88	172	209	539
<b>Summer</b>	Liver	198	117	56	371
	Lung	201	132	66	399
	Total	399	249	122	770
<b>Fall</b>	Liver	119	102	45	266
	Lung	72	79	43	194
	Total	191	181	88	460
<b>winter</b>	Liver	65	86	52	203
	Lung	146	103	51	300
	Total	211	189	103	503

#### 4. Discussion

The results demonstrated high rate of infection with hydatid cyst in the study population (slaughtered livestock in Khomein City). The cysts mainly targeted the lungs and there was a significant increase in rate of infection during summers. The widespread of the diseases in Iran is due to climate and wide range of the hosts. Average rate infection of the sheep in Iran was 10% (ranging 1-50%), this figure for the cow was 12% (ranging 1-28%). In Sanandaj, 6.1% of the sheep, 9.7 of the cow, and 20.6 of the goat were infected with the disease. In Zanjan, 19.1% and 22.9% of the sheep and the cow were infected respectively; and for Urmia, 8.49% of the sheep and 12.65% of the cow were infected. These results are consistent with our results (Dalimi et al., 2006, Mousavi et al., 2003).

Based on the results obtained by Deilami et al. in west and north provinces of Iran (1997-2000) similar frequency figures were obtained for tike and yellow jackal infected by echinococcus granulosus (22- 22.3%). In comparison, the infection was less spread in the Northern provinces, which is probably due to specific geographical conditions. Population of wild life in mountainous regions of the west of Iran is much less than that of north. That means yellow jackal and red fox do not play the main role in epidemiology of echinococcus (Ghasemi khah et al., 2003, Dalimi et al., 2006, Lotfi, 2001). In (Mobedi and Dalimi, 1994), fertility of the liver cyst in the sheep, the goat, the cow, and the Buffalo were reported 23.9, 20.5, 10.2, and 2.9% respectively. Surveys in hospitals in Qom

showed that the patients diagnosed with hydatid cyst and underwent surgery (2004-2007) were mainly constituted by housewives. One explanation is that this group has closer contact with contaminated vegetables (Mardani et al., 2009). As the results obtained based on studies on patients hospitalized in the hospitals subsidiary to universities in Kerman city (1991-2000) showed, men and women constituted 51.6% and 48.4% of the patients with the disease. The highest rate of infection was at age range of 21-30 years (28.3%). Majority of the patients were housewives (69%), followed by farmers (men; 22.5%). The disease's first target was liver (50%) and lung was at the next place (43.3%)(Eftekhari Ardakani, 2005). It was reported in (Fallah et al., 2008). Based on surveys of bacterial infection of hydatid cysts that no significant difference was observed between the livestock slaughtered in Hamedan and Borujerd. High rate of the infection in the both cities were bacterial and mainly caused by *Escherichia coli* and *klebsiella*. Surveys of spread of hydatid cysts observed in industrial slaughterhouses in Hamedan showed that highest frequency of infections in the cow were by hydatid and *fasciola* (16.2 and 9.5%) and higher infection rate among the sheep was by *dicrocoelium dendriticum* and *sarcocystis* (36.6%); 22.2% of the cases were infection of liver and lungs at the same time (Moshfe et al., 2003). These results are consistent with our results. Another study on Meisam slaughterhouse (southwest Tehran) between 2005 and 2009 showed a significant relation between removal of contaminated liver and lung and season so that in case of the cow, the highest rates of removal were in summer and spring (Khanjari et al., 2010). These results

are consistent with our study. Out of 80947 heads of sheep, 1530 were diagnosed with hydatid cyst (1.89%), and 60.3% of the cysts were fertile. Among the different regions under study, highest and lowest rates of the infection were in Mashhad (3.83%) and Karaj (0.83%). In general, different cities have different rate of infection and no considerable improvement has been made comparing with the past(Kohdar et al., 2009). A similar study in Arak between 1983 and 1993 by Mohebbali et al. reported that highest rate of the infection in human population was at age range of 40-49 and mostly housewives were infection and liver (78.8%) and lien (1.4%) were the first and last targets of the disease. Moreover, hydatid cyst among the cow and calf was 2.7%, among the sheep 2.4%, and among the goat 0.6 (Mohebbali and sammak, 1995). A comparison between these results and results of this study shows that the disease is more rampant in Khomein city than 10 years ago. In summary, this study demonstrated high levels of infection with hydatid cyst, which causes considerable losses whether in form of higher mortality rate of livestock or removal of contaminated limbs. Moreover, great health threat is imposed to the public, which demands implementation of stronger controlling and preventing measures in the society.

### References

1. ICT Centre. Agricultural Statistics. Ministry of Agriculture, 2011.
2. Moshfe A, Bagheri M, Mohebi Nobandegany Z. Prevalence of *Fasciola hepatica* in slaughtered livestock in Yasuj's slaughterhouse 2001-2002. *Armaghan-e- Danesh Journal* 2003;8(30):25-33.
3. Fallah M, Matini M. Examined the prevalence of common parasites of humans and livestock of animals slaughtered in slaughter house in

- Hamedan in 2009. *Journal of Medical Sciences and Health Services Hamedan*. 2010;17(3):57.
- 4.Zowghi E. *Zoonoses*: Jihad University Press; 1989. 722 – 82 p.
- 5.Eslami A. *Veterinary Helminthology Cestodes*: Tehran University Press; 1991. 117-67 p.
- 6.Ghasemi khah R, Dalimi A, Hashemi Malayeri B. Fatality effect of low-voltage electricity on hydatid protoscolex. *Arak University of Medical Sciences*. 2003;6(2):32-8.
- 7.Dalimi A, Ghamari Z, Qebleh F. Epidemiologic status of animal echinococcosis/ hydatidosis in Urmia. *The Journal of Pajouhesh va Sazandegi* 2006;71:76-81.
- 8.Lotfi M. Cystic parasitic diseases in the Iran & world 2001. 43-50 p.
- 9.Matossian RM, Rickard MD, Smyth JD. Hydatidosis a global problem of increasing importance. *Bull World Health Organ*. 1977;55(449-507).
- 10.Mehrabani D, Oryan A, Sajjadi SM. Prevalence of *Echinococcus granulosus* infection in stray dogs and herbivorous in Shiraz, Iran. *Vet Parasitol*. 1999;86:217-20.
- 11.Mobedi I, Dalimi A. *Epidemiology of Hydatid cyst in Iran and world*. Tehran: Moghadda Press. 1994.
- 12.Gabrial A. *Hydatid Disease*. Textbook of Surgery: Schwartz; 1998. 1624 -05 p.
- 13.Azizi d. *Hydatidosis*: Tehran University Press; 1985. 101-42 p.
- 14.Bashiri H. *Human pathogenic parasites*. Tehran University Press. 1991:200-31.
- 15.Jubb K, Kennedy P, Palmer N. *Pathology of domestic animals*: Academic Press: San Diego, California, USA 1993. 653 p.
- 16.Khanfar N. Hydatid disease: a review and update: *Curr Anaesth Crit Care*, 2004; 173-83 p.
- 17.Nayar S. Hypertrophy of the liver due to Hydatid cyst, A probable cause for recurrent tympany in a Cross , bred bull. *Indian vet J*. 1974;51:161-3.
- 18.Rickard MD, Williams JF. *Hydatidosis/Cysticercosis: Immune Mechanisms and Immunization Against Infection*. In: Baker JR, Muller R, editors. *Advances in Parasitology*. Volume 21: Academic Press; 1982. p. 229-96.
- 19.Maymandi nejad MH. *Epidemiology of hydatid cyst in the world and Iran*: Tehran University Press; 1965.
- 20.Foroozan A. Seasonal Changes in the frequency of claims hydatid cysts in livestock slaughtered in Gorgan 2000. 5-39 p.
- 21.Mousavi A, Hazrati k, Mehryar A, Nikbin R. Prevalence of human hydatid cysts in Orumieh city medical centers from 1991-2000 *URMIA MEDICAL JOURNAL*. 2003;14(2):9-15. eng % @ % [ 2003.
- 22.Mardani A, Babakhan L, Abedi F, Rafiei M. Epidemiological status of patients with hydatid cyst surgery in hospitals in the Qom city During 2004 to 2007. *Journal of Laboratory Sciences*. 2009;3(2).
- 23.Eftekhari Ardakani F. Distribution of hydatid cysts in Kerman university hospitals during 1991-2000. *Journal of Kerman University of Medical Sciences*. 2005;12(4):252-57.
- 24.Fallah M, kavand A, Yousefi R. A survey Bacterial Contamination of hydatid cysts and the type of bacteria that cause Infected animals slaughtered in slaughterhouses Hamedan and Boroujerd. *Journal of Medical Sciences Lorestan*. 2008;10(3).
- 25.Khanjari A, bukaei S, abbas zadeh S, nemati G, akhund zadeh A, Misaghi A. Prevalence of hydatid cysts in cattle slaughtered in Meysam South West of Tehran from 2005 to 2008. *veterinary journal (pajouhesh-va-sazandegi)*. 2010;88.
- 26.Kohdar V, Shojaei S, Radmehr B, Pakbaz F. Survey contamination Sheep hydatid cyst in different parts of Iran. *JOURNAL OF VETERINARY CLINICAL RESEARCH*. 2009;1(1):65-74.
- 27.Mohebbali M, sammak A. Study of Human Hydatidosis disease and infection of hydatid cyst in slaughtered livestock in slaughterhouses Arak. *ournal of Kerman University Medical Sciences*. 1995;3(1):22-7.