

## Full Length Research Paper

# Prevalence and fertility of hydatid cyst in slaughtered livestock of Urmia city, Northwest Iran

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Hydatidosis is one of the most important health problems in Iran. Scrutinizing disease situation in local intermediate and final hosts to find appropriate controlling and preventing methods is of special importance. This study was performed to determine the prevalence and types of hydatid cysts in entrails of slaughtered livestock in Urmia city. In this descriptive-cross sectional study, arranged with Veterinary Office and Slaughterhouse of Urmia, all 4564 livestock slaughtered along the study were investigated of having hydatid cyst after butchering and separation of internal organs. The isolated innards of the slaughtered animals were examined of having hydatid cyst by trained experts administrated by researchers. If a cyst be traced by experts, all information about slaughtered livestock and contaminated organ was recorded on especial sheets and then sent to Research Laboratory of Parasitology Department, Medicine Faculty, to determine its fertility status. Of 4564 livestock studied 245 (5.4%) were infected by *Echinococcus granulosus*, among them, 2.7% were sheep, 8.6% were cattle, and 12.9% were water buffalos. The highest frequency of cysts was pulmonary type of hydatid cyst. About 38% of cysts were fertile and the other 62% were infertile. The fertility rates of hydatid cyst in sheep, was 37% for liver and 26% for lung; in water buffalo, it was 46% for liver and 44% for lung; and in cattle, it was 43% for liver and 39% for lung infection. The results of this study showed that the rampancy of contamination by hydatid cyst as well as its fertility rate was obviously high in slaughtered water buffalos. So, because of economic forfeitures of obliteration of these contaminated entrails and to prevent the transmission of the infection to human, it is extremely necessary to control propagation of the disease in this region.

**Key words:** Hydatid cyst, slaughterhouse, fertile, Urmia.

## INTRODUCTION

Hydatid cyst that in fact is the larval stage of tape worm *Echinococcus granulosus* is one of the zoonotic disorders that could infect human (Soulsby, 1982). Infection to hydatid cyst has worldwide propagation and is domestic in some parts of the world like Australia, Greece, as well as Middle East countries including Iran (Fakhkhar et al., 1990). Because of extensive distribution throughout the

world, it gets such a significant attention that prevention of hydatidosis is one of the dynamic programs of World Health Organization in the field of zoonotic disorders (WHO Report, 1982). Distribution of this disease is more extensive in the rural regions that use dogs as guard of domestic animals (Radfar et al., 1991)

By contamination of livestock, hydatid cyst causes tremendous economic detriment on the world countries. On the other hand, infection of a person to this illness causes serious risks for his health and in some cases could bring about the risk of death (Dalimi et al., 2002). For example, in the studies done in Iran throughout the

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**Table 1.** Contamination abundance of hydatid cyst in examined carcasses in Industrial Slaughterhouse of City.

Livestock	Examined No.	Contaminated No.	Contaminated (%)
Sheep	2855	76	2.7
Water buffalo	517	67	12.9
Cattle	1192	102	8.6
Total	4564	245	5.4

years 1977 and 1978, the economic loss for obliteration of contaminated viscera from animals of slaughterhouse as well as the cost of surgery, hospitalization before and after surgery, convalescence period, and mortalities caused by this disease was about 180,000 dollars annually (Radfar et al., 1991); although it could be cited that because of yearly increase in prices, the mentioned costs must be much more. Some researchers believe that the hygienic importance of the infection is much more than its economic one and they do immense efforts to control it (Gemmell et al., 1985). Undoubtedly it is necessary for us to know more about its epidemiology and dispersion. Epidemiologic researches done in each geographic location could be used to extinguish and even root its endemic disorders. So a comprehensive study about this disorder seems to be essential to proffer adequate guidelines to struggle with and control the disease. So this study was done to deduce the prevalence of infection by hydatid cysts in slaughtered livestock of Urmia city.

## MATERIALS AND METHODS

In this descriptive-cross sectional study, after necessary coordination with veterinary office, all livestock that were slaughtered throughout the study in industrial slaughterhouse of city were investigated. The count of all animals that were inspected was 4564, including 1855 sheep, 1192 cattle, and 517 water buffalos. The procedure of the study was in this manner that first of all, separated entrails of all slaughtered animals were examined precisely by educated experts for the presence of hydatid cyst, and when a cyst had been seen, all information about the slaughtered livestock and contaminated organ was recorded on specially designed sheets. After it, the contaminated organs of infected animals were sent to Research Laboratory of Parasitology, Medicine Faculty, to confirm the presence of cyst and to determine its fertility status.

## RESULTS

In this study 4564 livestock were examined, among them 245 were infected by hydatid cyst, that is, the contamination proportion of this infection was 5.4%. This proportion was the highest in water buffalos (12.9%). Table 1 shows the contamination abundance and proportion separately in each examined livestock. Table 2

accents that in the examined animals, abundance of pulmonary type of hydatid cyst was the highest.

In the view of the fertility of cysts, as cited in Table 3, fertility rate was 38% (43% of fertile cysts was hepatic and the other 57% was pulmonary) and the other 62% of cysts were infertile (37% infertile cysts was hepatic and the other 63% was pulmonary).

## DISCUSSION

Hydatid cyst is a cyclo-zoonotic parasite and could involve human being seriously. It could also infect domestic quadrupeds like cow, sheep, goat, water buffalo, camel, elk, llama, pig and horse (Soulsby, 1982). The disorder caused by this parasite (hydatidosis) is one of the most important health service as well as economic problems in various parts of the world including Iran; it is endemic especially in societies that veterinary is a common job. Studies done recently on various hosts of this parasite in several locations in Iran revealed that contamination by it is dramatically high; as contamination of sheep and goat to this infection was reported respectively as follows: 2.4 and 6% in Arak (Mohebbali et al., 1995), 5.5 and 5.7% in Kerman (Sharifi et al., 1996), 3.9 and 2.5% in Oghlid (Oghlidi, 1987), and 4.9% in Feridoun (Nilforoushan, 1987). The probable reasons for the statistical differences between infection rates in various cities could be brought as: hygienic status of slaughterhouses, climatologic conditions, contamination rate in the intermediate host, dog in each place, slaughtering manner and feeding status of animals.

Some findings and experiments shows that an appropriate and short-time guideline to control this disease in human communications, could be treating stray dogs and cattle, and education of hygienic principles as another short-time guideline may not be much effective and the studies fulfilled in some regions with high endemicity of this disease affirms this claim (Macpherson et al., 1986).

Lifecycle of the parasite in each location depends to various factors. The main factor is the facility to reach discarded entrails of livestock by dogs. The more entrails are contaminated by cyst, the more dogs may be infected by consuming them and vice versa. But this factor is not

Table 2. Contamination abundance of hydatid cyst according to contaminated organ in examined carrions in Industrial Slaughterhouse of City.

Livestock	Liver No.	%	Lung No.	%
Sheep	30	1	46	1.6
Water buffalo	26	5	41	7.9
Cattle	40	3.3	62	5.2
Total	96	9.3	149	14.7

Table 3. Contamination abundance of hydatid cyst according to fertility and infertility status of the cysts in examined carrions in Industrial Slaughterhouse of City.

Livestock	Liver				Lung			
	Fertile No.	%	Infertile No.	%	Fertile No.	%	Infertile No.	%
Sheep	11	37	19	63	12	26	34	74
Water buffalo	12	46	14	4	18	44	23	56
Cattle	17	43	23	57	24	39	38	61
Total	40	43	56	37	54	57	95	63

the sole reason of parasite dispersion, and some studies quoted that there is not always a parallel relationship between the infection of dogs and sheep. Other factors that severely participate in contamination proportion of dogs includes: the kind of animal infected by cyst (sheep, cow, goat, camel, pig, etc.), infected organ (liver, lung, etc.), cyst's size, its fertility, etc. (Fallah et al., 1998).

In this study, the rampancy of hydatid cyst in sheep, water buffalos, and cows were 2.7, 12.9 and 8.6%, respectively. As shown in Table 1, the prevalence of contamination in sheep is less than it is in both water buffalos and cows and in contrast to some other studies, the infection rate is not very high. Example of such studies, includes a study done in Zanzan, the contamination rampancy's were 19% in sheep, and 23% in cows (Nourian et al., 1998). In another study done in Shirvan, 27% of cows exhibited hepatic and 32% showed pulmonary infections, whilst contamination of sheep liver was 6.9% (Javaheri et al., 1996). Checking some studies accomplished in other countries showed severe contamination rampancy's of this parasite in its hosts, as contamination rate in Pakistan was 38.9% for cows and 33% for water buffalos (Khan et al., 1990), whereas its rate in North India was reported as 48% for water buffalo, 48% for sheep, and 21% for goat (Singh et al., 1988).

Table 2 Shows that the most contaminated organ in sheep, cattle and water buffalos, is lung, and this finding is in parallel with previous studies (Oghlidi, 1987; Sharifi et al., 1996; Mohebbali et al., 1995).

As cited above, the fertility of cyst is one of the main

factors that could influence contamination proportion in dogs. In this study, the fertility rates of hydatid cyst in examined animals were as follows: in sheep, it was 37% for liver and 26% for lung; in water buffalo, it was 46% for liver and 44% for lung; and in cattle, it was 43% for liver and 39% for lung infection. A study done in Iran exclaimed fertility proportion of hydatid cyst as 88, 19 and 70% for sheep, cow and camel, respectively (Hosseini et al., 1998). In another study done in Zanzan to determine fertility rate of cysts, it was clarified that 49% of cysts in sheep were fertile and another 30% were a mixture of fertile and infertile cysts, whereas only 3.5% of cysts in cows were a mixture of fertile and infertile cysts (Hamidieh et al., 1998). Another study done in Arbil, North Iraq, reported that the fertility rates of the cysts were 64, 37 and 29% in sheep, goats and cows respectively (Saeed et al., 2000).

As it could be deduced from Table 3, fertility rate of hepatic cysts is more than its pulmonary type; and comparison of the tested animals about the importance of this rates shows that it is also more important in water buffalos than the other two ruminants. Although the contamination rates of livestock (especially sheep) were not seriously high in this study, high fertility rate of cysts could eventually cause considerable contamination of dogs to mature worms and subsequent distribution of many zygotes in nature.

In this study, both propagation and fertility rate of hydatid cyst in water buffalos were higher than cattle, as well as sheep. Because of increasing local tendency for

ranching water buffalos, that with current hydatidosis status of the place could cause no compensable detriments on local economic and hygienic orderliness, it is recommended that the basis of some fundamental activities be inserted in procedural programs of veterinary office. Some of these activities could be as follows: establishment of hygienic slaughterhouses, obliteration of stray dogs, treatment of domestic and cattle-guard dogs, education of ranchers and the people who contact livestock, designing social educational programs about correct sepulchering procedures, especially for the people living in places that the disease is endemic there, education of people about transmitting ways, and appraising weak and strong points of hygienic and veterinary services.

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