

## Survey on Hydatid Cyst Infestation in Sarab City (Northwest of Iran) Using Epidemiological and Seroepidemiological Criteria

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**Abstract:** Echinococcosis is the major helminthic parasitic infestation in Iran. The health hazard and economic loss in man and livestock is significant. Human infection does not occur from eating infected offal. People usually become infected by accidentally swallowing the tape worm eggs passed in dog faeces. A human acts as an intermediate host in the same way as a sheep, horse or cattle. The eggs travel through the blood stream, lodge in organs and form watery cysts full of tape worm heads. This is known as hydatid disease or echinococcosis. Hydatid disease is not contagious and is not passed by person to person contact. The symptoms of hydatid disease depend on which organs are affected. The most commonly affected organ is the liver. The kidneys, brain and lungs are sometimes affected. In rare cases, hydatid cysts may form in the thyroid gland or heart or within bone. In study two major topics as the prevalence of hydatid cyst in human population and in livestock were studied. Total of 250 serum samples in different age groups in Sarab city in Northwest of Iran were examined by indirect Immunofluorescent test (IFA). In Sarab city 3.2% of serum samples were positive for hydatidosis. In livestock using abattoir inspection infestation rate was 32.4, 26.8, 19.1 and 17.5% for goat, cattle, sheep and buffalo, respectively.

**Key words:** Echinococcosis, hydatid cyst, livestock, sarab, organs, Iran

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### INTRODUCTION

Hydatid disease is one of major parasitic problems in man and livestock in Iran. This multi-host parasitic is prevalent all over the country particular in the Northwest of Iran. Annually the economic loss in livestock due to this parasite is significant. According the world data Iran is one of the hyper-endemic areas with human infection rate of >1% of total population of the country (Arbabi *et al.*, 1998a). *Echinococcus granulosus* is the major cause of disease in Iran. The stray dogs as the final host and sheep as the intermediate hosts have major role in the transmission of the disease all over the country (McManus *et al.*, 2003). A person who comes in contact with the faces of an infected dog (that is when eggs from the tape worm are passed in the faces) may develop hydatid disease. Infestation with tape worm eggs causes cysts to form in vital organs such as the liver and lungs (Scott *et al.*, 1997). The tape worm needs two hosts to complete its life cycle. Intermediate host such as sheep, pigs, cattle, goats, horses, camels, wallabies and kangaroos (Kamenetzky *et al.*, 2002). Infestation begins when the grazing animal eats dog or dingo faces infected with tape worm eggs (Moro and Schantz, 2006). The eggs hatch in the animals gut into embryos (called

oncospheres). These embryos penetrate the wall of the intestine and are carried in the blood stream to vital organs such as the liver, lungs or brain where they can develop into watery blisters called hydatid cysts (Thompson and Lymbery, 1990). These cysts contain around 30-40 tape worm heads (the first segment of the tape worm). A mature fertile cyst may contain several million such heads (Baldock *et al.*, 1985). Diagnosis of hydatid disease may include: medical history, physical examination, X-ray examination, ultra sound, CTscan, MRIscan, examination of blood, urine, sputum, faces or other body fluid if a burst hydatid cyst is suspected, blood tests for antibodies to the cysts (Cabrera *et al.*, 2002). The Northwest part of Iran is more affected by this parasite than the other parts due to environmental condition of the region (Arbabi *et al.*, 1998b). According to the importance of the disease and obtaining data for its prevalence, the present study was conducted in Northwest of Iran.

### MATERIALS AND METHODS

In this study, 2 major topics were considered as the sero-epidemiology of hydatid disease in human population using indirect Immunofluorescent Antibody

test (IFA) and abattoir surveillance of infestation in livestock by carcass inspection of sheep, goat, cattle and buffalo in slaughter houses. Total of 250 serum samples in Sarab city were collected and transferred to the school of public health laboratory in deep freezed conditions. The serum samples were tested by indirect Immunofluorescent Antibody test (IFA) for hydatid cyst infestation. The infestation rate of slaughtered sheep, goat, cattle and buffalo also was determined by inspecting 2345 livers and lungs in sarab abattoir.

**RESULTS AND DISCUSSION**

Distribution of human hydatid cyst in Sarab city in shown in Table 1. The highest infected cases observed in age group of 20-40 years old. The 70% of infected cases were female, most of them were housewife. There was direct relationship with illiteracy of the families and the infestation rate.

Abattoir data of hydatid cyst infestation mostly concentrated on the local livestock. The infestation rate in goat was much higher than cattle, sheep and buffalo with 32.4% in goat, 26.8% in cattle, 19.1% sheep and 17.5% in buffalo, respectively (Table 2). The lungs were more infected than livers.

Distribution of hydatid cyst infestation in domestic animals exists in whole parts of Iran but the percentage of infestation is differed in different province. The highest rate usually can be seen in west part of Iran for example in Hamadan with 20% infestation rate in stray dogs and high prevalence in man mostly females (Arbabi *et al.*, 1998b). Also in varamin area in south of Tehran 68 out of 700 serum samples (9.7%) were positive by IFA test (Mohammadi, 1998). Relationship between sheep herds and dogs is very close, infected faces of dogs scattered near by the sheep herds and due to dryness of the area usually with movement of sheep the eggs float in the air and the eggs with dust swallowed by the sheep

Table 1: Distribution of human hydatid cyst in Sarab city using serological test of (IFA)

Locality	No. of serum samples	No. of positive cases	Infection rate (%)
Sarab city	250	8	3.2

Table 2: Distribution of hydatid cyst infection in slaughtered livestock in Sarab city

Animals	No. of inspected	No. of positive	Infection rate (%)
Cattle	410	110	26.8
Buffalo	40	7	17.5
Sheep	1698	325	19.1
Goat	197	64	32.4
Total	2345	506	21.5

(Khuroo, 2002). Most of the pastures in the west contaminated by the Echinococcus eggs and the egg are very resistant to draught wich changes of transmission will be increased (Guarnera *et al.*, 2004). The stray dogs usually feed on the abattoir ofals and easily they will have access to the infected viscera of slaughtered animals because the abattoir control in most part of the country is poor and infected ofals usually not condemned (Arbabi *et al.*, 1998a). The number of hunted dogs was limited which can not be statistically relating it to stray dogs population in the area (Mohammadi, 1998).

**CONCLUSION**

The number of human infected cases is high and the hospital data demonstrate a high level of hydatid cyst surgery taken place annually. The economic losses due to hydatid disease in domestic animals are significant in sheep and cattle (losing weight and most of the infected liver will be out of use) (Norjah, 1971).

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