

*Short Communication*

Hydatid cysts protoscolices viability and fertility of cysts isolated from various animals in Ilam Province

S. Salari^{1,4*}, M. Pooyanmehr², I. Karimi³, A. Rashki³

¹Microbiology Department, Veterinary Medicine faculty of University of Tehran, Tehran, Iran

²Department of Pathobiology, School of Veterinary Medicine, Razi University, Kermanshah, Iran;

³Department of Basic Veterinary Sciences, Razi University, Kermanshah, Iran

⁴College of Veterinary Medicine, Zabol University, Zabol, Iran

*Corresponding author's email: saeedsalari@ut.ac.ir

ABSTRACT

Echinococcosis, a worldwide zoonosis, is caused by the larval stages of *Echinococcus granulosus* and *E. multilocularis* belonging to the family taeniidae. Because of the increasing consumption of red meat; survey, prevention and treatment of this disease will be essential. Also detection of contaminant factors including parasitic agents and the factors that are related to the hosts is helpful to codify a useful programme for prevention of this disease. This slaughterhouse based survey has been done to determine the rate of hydatidosis in Ilam province on 2380 sheep, 975 goats and 1820 cows. Overall 10% of infected livers and lungs from each animal group randomly collected and the number of cysts was determined macroscopically. The rate of hydatidosis was 6.8 % in sheep, 4.2 % in goats and 8.6 % in cows. The infection rates of lungs in sheep, goats and cows were 82, 73 and 75%, respectively, while the infection rates of livers were 12, 8 and 13%, in sheep, goats and cows, respectively. The difference of infection rates between lung and liver was statistically significant ($p < 0.05$). After transferring of specimens to the laboratory for detection of protoscolices, results shows that the rate of alveolar cysts were teemed in sheep, cows and goats were 12 %, 24 % and 22 %, respectively and also exuberated hepatic cysts in sheep, cows and goats were 25 %, 2.5 % and 18 %, respectively. The rates of alive protoscolices in fertile cysts were determined by eosin staining and the percentage of protoscolices that were stained were considered alive. Their cumulative rates were 79.45, 88.95 and 72.02 % while their rates in livers were 65.71, 38.45 and 86.14% in sheep, cows and goats, respectively. These results showed a considerable infection of sheep and goats in this region. It could be concluded that because sheep, goats and guard dogs are maintained close to together, therefore these high rates of infection are due to continuous contact of these animals with dogs and their feces. Also low knowledge of people about true prevention strategies especially in the deprived region that has nomadic inhabitants may be the main cause of increasing of hydatid cyst infestation. The prevention strategies like suitable annihilation of infected viscera would be key task in decreasing hydatid cyst rate in Ilam.

Keywords: Hydatid cyst, Ilam, protoscolex, zoonosis

INTRODUCTION

Transmissible diseases between humans and animals are important public health problem in many countries, especially developing countries which also makes great economic losses. This category of diseases and their reservoirs in domestic and wild animals, created a lot of problems in urban and rural communities and regardless of the discomfort, the incidence and mortality of these diseases in humans, their adverse effects on livestock production, reduced availability of nutrients and creating obstacles in international trade are also important (Arfa, 1994). With the advancement of medical knowledge in the field of control of human-specific infectious diseases, the attention to zoonotic diseases have increased in international and national health organizations. According to this fact, the annual congresses, several seminars and training courses at various levels, with specific focus on coordination and cooperation between veterinary and public health organizations for surveillance and control of diseases have been held.

The hydatid cyst disease is a zoonosis that is formed by the larvae of the genus *Echinococcus* belonging to taeniidae family. The most important species that are the cause of the cyst formation in human and animals are *Echinococcus granulosus* and *Echinococcus multilocularis* (Arfa, 1994; Eslami, 1997). Due to the high consumption of meat in the world, its identification, prevention and treatment are necessary. Therefore, recommendations and provided instructions for treatment require health care protocols. Determination of infection factors which are categorized into parasitic and host factors is very important to develop an appropriate program to prevent and combat with parasitic infections (Eslami, 1997). The present study was aimed to assess prevalence of hydatidosis in ruminants of Ilam province of Iran.

MATERIALS AND METHODS

Cross-sectional study was done by monthly visiting the slaughterhouse of Ilam, monthly, organs which infected with cysts in various animals were collected and recorded. After collecting the various infected organs in animals, samples were moved to the laboratory center of Razi hospital of Ivan city and specimens were tested.

After cutting the surrounding tissue of the cysts of infected organs and cysts isolation, first, outer surface of organs was cleaned by iodine tincture, then, using the scalpel, their wall were cut off and germinal layer was removed. Cyst contents were washed several times with saline, obtained fluid was collected separately from each sample in a glass beaker to determine fertile or sterile cysts at this stage (Forozan, 2000). Cysts without protoscolices and caseous cysts were considered as sterile cysts. Also, if the fluid was transparent and had no protoscolices, the cyst has been considered as sterile, and finally, animal and organs according to their fertile and non-fertile cysts were recorded.

To determine the viability of protoscolices, first, small drops of fluid from fertile cysts removed and placed on slides by Pasteur pipette and Eosin 1% was added. Then after putting cover slip, protoscolices were examined using a microscope with a magnification of 40. If protoscolices are alive, the eosin cannot enter to protoscolice and the live protoscolice has the green color while the dead one, absorb the color and therefore appear red. Usually hundred protoscolices were checked and the number of protoscolices that did not absorb the colors (alive) was recorded.

RESULTS

In Ilam province, the rate of hydatidosis from total 2380 sheep, 975 goats and 1820 cattle, was 6.8 % in sheep, 4.2 % in goats and 8.6 % in cattle.

The infection rates of lungs and liver in sheep were 82%, and 13%, while in goat were 73%, and 8%, respectively. In cattle, the infection rates of lungs and liver were 75%, and 13%. The infection rates of other organs in sheep, goats and cattle were, 6%, 19% and 12%, respectively. The difference of infection rates between lung and liver was statistically significant ($p < 0.05$).

Results shows that the rate of alveolar cysts were teemed in sheep, cows and goats were 1 %, 24 % and 22 %, respectively and also exuberated hepatic cysts in sheep, cows and goats were 25 %, 2.5 % and 18 %, respectively.

The rates of living protoscolices in fertile cysts of lung and liver were determined. Their cumulative rates in sheep were 79.45%, 65.71%; in goats were 72.02%, 86.14%; in cattle 88.95% and 38.45%, respectively.

DISCUSSION

Infection rates obtained in Ilam were 6.8% in sheep, 4.2% in goats and 8.6% in cattle. Previously prevalence of hydatid cyst have been reported in Sanandaj sheep, cattle and goats 6.1%, 9.7%, and 20.6% respectively (Yakhchali, 2007), while in Zanjan, in sheep and cattle were 19.1% and 22.9% respectively, in Urmia the prevalence was 8.49%, 12.65% and 12.44% in sheep, cattle and buffalo, respectively (Dalimi, 2006). Dalimi and colleagues studied the prevalence of infection in the province of Lorestan which in sheep, goats and cattle was 25.29%, 11.08% and 55.94%, respectively. In Kordistan province, 5.43% of sheep, 3.06% of goats and 9.49% of cattle and in Ilam, 22.97% of sheep, 7.19% of goats and 33.83% of cattle were infected (Dalimi, 2002).

These records indicate a high infestation of sheep and goats in the country. Since these animals are reared in Iran and in most cases together and sheep and goats and cattle flock has many guard dogs, the high rate of infection in constant contact with dog feces is reasonable. Lack of correct knowledge about prevention methods and treatment of disease in farmers, especially those living in tribal areas, is the major cause of the high prevalence of hydatid cyst between infected sheep and goats.

By attention to above notes it could be concluded that the methods of education must be revised, prevention and treatment by a special team of veterinarian should be done and accurate and timely advice to farmers by veterinary technicians must be increased. In addition to these activities, preventive measures especially accurate eradication of infected organs are the key points to reduce the infection rate of hydatid cyst in Iran.

REFERENCES

- Arfa F. Medical helminthology. 1994. *Pajouh publication*. pp. 127-148. (In Persian)
Dalimi AH, Ghamari Z, Qebleh F. 2006. Epidemiologic status of animal echinococcosis/ hydatidosis in Urmia. The Journal of Pajouhesh va Sazandegi, 71: 76-81. (In Persian)

- Dalimi AH, Motamedi G, Hosseini M, Mohammadian B, Maleki H, Ghamari Z, Ghaffari Far F. 2002. Echinococcosis/hydatidosis in Western Iran. *Veterinary Parasitology*, 105: 161–171.
- Eslami A. 1997. *Helminthology, cestodes, Volume II*, Tehran University Press. pp. 119-135. (In Persian)
- Forozan A. 2000. Seasonal variation and prevalence of hydatid cysts in cattle slaughtered in Gorgan. DVM thesis. Faculty of Veterinary Medicine, Karaj. (In Persian)
- Yakhchali M, Saeidi M. 2007. Prevalence and economic damages of hydatidosis in the ruminants in Sanandaj, Kordistan province, 2005. Iranian Congress of Hydatid cyst, Yasuj. (In Persian)