

## Effect of Triclabendazole and Levamisole on Experimental Hydatid Cyst in Rat

<sup>1</sup>Garedaghi Yagoob, <sup>2</sup>Khayatnouri Mirhadi,

<sup>3</sup>Sadeghi Peyman and <sup>4</sup>Safarmashaei Saeid

<sup>1</sup>Department of Pathobiology,

<sup>2</sup>Department of Pharmacology,

<sup>3</sup>Post Graduated Student of Veterinary Medicine,

<sup>4</sup>Young Researchers Club,

Tabriz Branch, Islamic Azad University, Tabriz, Iran

---

**Abstract: Problem statement:** Hydatidosis has dispersed worldly and is one of the common dangerous diseases between human and animals and is found abundantly in areas that human, dogs and herbivorous are in close relationship. **Approach:** In this study, firstly, 32 rats were divided into two groups of control and case and 2000 protoscolices were injected into peritoneal hole. After two months, rats of case group were feed by drinkable 5 mL Triclabendazole + 3.41 mL Levamisole for 60 days. Then after 6 months of contamination period, rats of control group and case group killed by anesthetic drug then necropsy and guts inspection of hydatid cyst was implemented. **Results:** The results show that in livers of control group there are 2 cysts, in kidneys 9 cysts and in lungs 87 cases. Average of contamination in this group to hydatid cyst was 32.6 but in case group there were in liver on cyst, in kidneys 5 cysts and in lungs 63 cysts. Average of guts contamination to hydatid cyst in case group was 23. **Conclusion:** Analyzing results in case and control groups shows that Triclabendazole + Levamisole drugs effect was 30% that this amount is not sufficient for hydatid cyst treatment.

**Key words:** Hydatid cyst, hydatid fluid, hydatid sand, flatworm echinococcus, cosmopolitan distribution, hydatid disease, peritoneal hole, occupying lesions, antihelminthic chemotherapy, latex agglutination

---

### INTRODUCTION

Species under genus *Echinococcus* are small tapeworms of carnivores with larval (metacestode) stages known as hydatid proliferating asexually in various mammals including humans (Xiao *et al.*, 2005; 2006). Hydatid cyst has a worldwide distribution and has been recognized since ancient times (Gulam *et al.*, 2002). Human hydatidosis is a parasitic infection of the liver and other organs caused by the flatworm *Echinococcus*, most commonly *E. granulosus* which is a 5 mm long hermaphroditic tapeworm that has dog, foxes or coyotes as the definitive host and sheep, swine, cattle and zebra as the intermediate host. Hydatidosis is a cyclozoonotic infection of cosmopolitan distribution (Morris and Richards, 1992; Gossios *et al.*, 1997). It is one of the main forms of parasitic disease in farm animals caused by the larval stage of *Echinococcus* tape

worms which utilize canines as definitive host and various herbivores or rodent as intermediate host. These cysts are characterized by cystic space occupying lesions in the liver, the lungs and rarely in other parts of the body (Dhaliwal and Kalkat, 1997; Halilolu *et al.*, 1997; Topcu *et al.*, 2000; Ghaly, 2009). Therefore the aim of present study was to determine the effect of Triclabendazole on experimental hydatid cyst in rat.

### MATERIALS AND METHODS

In this study, firstly, 32 rats were divided into two groups of control and case and 2000 protoscolices were injected into peritoneal hole. After two months, rats of case group were feed by drinkable 5 mL Triclabendazole +3.41 mL Levamisole for 60 days. Then after 6 months of contamination period, rats of control group and case group killed by anesthetic drug

---

**Corresponding Author:** Garedaghi Yagoob, Department of Pathobiology, Tabriz Branch, Islamic Azad University, Tabriz, Iran  
Tel: 00989143110499

then autopsy and guts inspection of hydatid cyst was implemented. Then number of hydatid cyst in internal organs especially liver, lungs and kidneys of rats were enumerated and also hydatid fluid aspirated and by light microscope for inspection of hydatid sand was studied.

### RESULTS

All results of present study in following tables and figures have been shown. Table 1 and 2 shows the number of hydatid cyst in rats of control and case groups respectively. Figure 1 and 2 shows hydatid cysts in rats.

Table 1: Number of hydatid cyst in control group

Infected organ	No of hydatid cyst	Color of hydatid cyst	Diameter of hydatid cyst
Liver	2.0	White	2-5 mm
Kidney	9.0	White	5-6 mm
Lung	87.0	White	3-8 mm
Average of infestation to hydatid cyst	32.6	-	-

Table 2: Number of hydatid cyst in case group

Infected organ	No of hydatid cyst	Color of hydatid cyst	Diameter of Hydatid cyst
Liver	1	White	2-4 mm
Kidney	5	White	4-5 mm
Lung	63	White	2-6 mm
Average of infestation to hydatid cyst	23	-	-

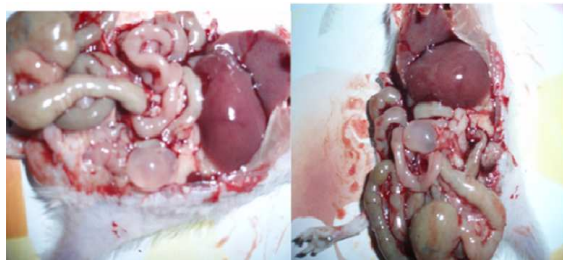


Fig. 1: Hydatid cyst into internal organs of infected rats

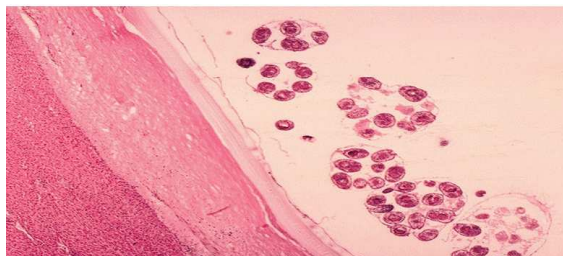


Fig. 2: Hydatid sand and protoscolex of it

### DISCUSSION

Hydatid disease is known since the time of Hippocrates. Although the liver is the most common site of infection in adults, the most common site of infection in children is the lung (Topcu *et al.*, 2000; Halilolu *et al.*, 1997; Dhaliwal and Kalkat, 1997). Hydatid disease is seen endemically among sheep raising communities. The disease still continues to be a serious problem in countries like Australia, New Zealand, Middle East, Africa, India, South America, Turkey and Southern Europe (Arora *et al.*, 2006). Various soft tissue sites involved by hydatid cysts and reported in literature include those of muscles and subcutaneous tissue (neck, chest, axilla, abdomen, thigh and palm) (Dirican *et al.*, 2008; Bedioui *et al.*, 2007).

In humans Routine laboratory tests can only reveal eosinophilia. A number of serological tests can be done for screening, diagnosis and follow up for recurrence of hydatid disease. Highly sensitive tests include indirect haemagglutination and Latex agglutination test. Confirmation of diagnosis can be done by highly specific tests including immunoelectrophoresis, double diffusion test and ELISA and radioallergosorbent test (Xiao *et al.*, 2006). Radiological imaging including USG, CT and MRI are excellent imaging modalities for hydatid cysts, which can delineate exact site as well as identify the daughter cysts and hydatid sand which are specific to echinococcal infestation. MRI can also show a typical distinctive feature of cyst within cyst in case of the multicystic hydatid cyst (Chevalier *et al.*, 1994).

So far some study on this subject has been done; in one study by Horton *et al.* (1999) study on Chemotherapy of Echinononnis infection in Rat with albendazole was done and efficacy rate of this drug 46% reported. In other study efficacy rate of Triclabendazole on treatment of hydatid cyst 39% reported. In study on Chemotherapy of Echinococcus infection in Rat with Triclabendazol-Levamisole effect of these drugs on treatment of lung hydatid cyst 37%, liver hydatid cyst 41% and renal hydatid cyst 28% were determinate. In study by Polat *et al.* (2009) on effect of albendazole and povidone iodine For Hydatid cysts protoscolices, in vitro and- vivo, the efficacy rate of albendazole 95% reported. Surgery remains the treatment of choice for hydatid cyst. Antihelminthic chemotherapy alone may be effective in 30-40% of patients. It is most effective in alveolar hydatid, less so for liver infections and essentially ineffective for the diseases of the bone, brain, eye and other sites. Hydatid cyst is best treated by complete excision of the cyst (Arora *et al.*, 2006).

## CONCLUSION

Result of present study indicated that administration of Triclabendazole-Levamisole for hydatid cyst treatments is not sufficient in rats.

## REFERENCES

- Arora, V., I.S. Nijjar, K.S. Gill and G. Singh, 2006. Case report: Primary hydatid cyst of muscle-a rare site. *Indian J Radiol. Imag.*, 16: 239-241. DOI: 10.4103/0971-3026.29100
- Bedioui, H., A. Makni and K. Nouira, A. Mekni and A. Daghfous *et al.*, 2007. Subcutaneous hydatid cyst. Case report of an exceptional location. *Med. Trop (Mars)*, 67: 181-182. PMID: 17691440
- Chevalier, X., A. Rhamouni, S. Bretagne, J. Martigny and B. Larget Piet, 1994. Hydatid cyst of the subcutaneous tissues without other involvement: MR imaging features. *AJM Am. J. Roentgenol*, 163: 645-646. PMID: 8079861
- Dhaliwal, R.S. and M.S. Kalkat, 1997. One stage surgical procedure for bilateral lung and liver hydatid cysts. *Ann. Thorac Surg*, 64: 338-41. PMID: 9262571
- Dirican, A., B. Unal, C. Kayaalp and V. Kirimlioglu, 2008. Subcutaneous hydatid cyst occurring in palm and thigh; two case reports. *J. Med. Case Reports*, 2: 273. DOI: 10.1186/1752-1947-2-273
- Ghaly, A.E., 2009. The black cutworm as a potential human food. *Am. J. Biochem. Biotechnol.*, 5: 210-220. DOI: 10.3844/ajbbsp.2009.210.220
- Gossios, K.Y., D.S. Kontoyiannis, M. Dascalogianaki and N.C. Gourt Soyianis, 1997. Uncommon location of hydatid disease. *Eu. J. Radiol*, 7: 1303-08. PMID: 18626530
- Gulam, N.L., A.B. Mohd, A. Noor, B. Adil and A.G. Showkat, 2002. Single stage bilateral minimally invasive-approach for pulmonary hydatid diseases an alternative technique. *J. Thorac. Cardiovasc Surg.*, 124: 1021-1024. DOI: 10.1067/mtc.2002.122315
- Halilolu, M., I. Saatci, O. Akhan, M. Ozmen and A. Besim, 1997. Spectrum of imaging findings in pediatric hydatid disease. *AJR Am. J. Roentgenol*, 169: 1627-1631. PMID: 9393178
- Horton, R.J., 1999. Chemotherapy of Echinononnis infection in man with albendazole. *Trans. R Soc. Trop. Med. Hug.*, 83: 98-103. DOI: 10.1016/0035-9203(89)90724-4
- Morris, D.L. and K.S. Richards, 1992. Text Book of Hydatid Diseases; Current Medical and Surgical Management. 1st Edn., Butterworth, Heinemann, London, ISBN: 9780750613798, pp: 25-30.
- Polat, E., M. Aslan, H. Cakan, S. Saribas and T. Ipek *et al.*, 2009. The effect of albenda zole and povidone iodine for hydatid cysts protoscoleces, *in-vitro* and *vivo*. *Afr. J. Microbiol. Res.*, 3: 743-746. ISSN: 1996-0808
- Topcu, S., C. Kurul I, I. Tastepe, D. Bozkurt and E. Gulhan *et al.*, 2000. Surgical treatment of pulmonary hydtid cysts in children. *J. Thorac. Cardiovasc. Surg.*, 120: 1097-10101. <http://jtcscs.netjournals.org/cgi/content/full/120/6/1097>
- Xiao, N., J. Qiu, M. Nakao, T. LI and W. Yang *et al.*, 2005. Echinococcus shiquicus n. sp., a taeniid cestode from Tibetan fox and plateau pika in China. *Int. J. Parasitol.*, 35: 693-701. PMID: 15862582
- Xiao, N., J. Qiu, M. Nakao, T. Li and W. Yang *et al.*, 2006. Echinococcus shiquicus, a new species from the Qinghai-Tibet plateau region of China: Discovery and epidemiological implications. *Parasitol. Int.*, 55: 233-236. PMID: 16337180