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Effect of Triclabendazole and Levamisole on Experimental Hydatic Cyst in Rat

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Abstract: 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. In this study, firstly, 32 rats were divided into two groups of control and case and 2000 protoscolices were injected into peritoneal hole. After 2 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. 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. 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, rat, triclabendazole, levamisole, drinkable, dangerous, Iran

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 (Lone *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). Therefore, the aim of present study was to determine the effect of Triclabendazole on experimental hydatic 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 2 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 autopsy and guts inspection of hydatid cyst was implemented.

Then, number of hydatic cyst in internal organs especially liver, lungs and kidneys of rats were enumerated and also hydatic fluid aspirated and by light microscope for inspection of hydatic sand was studied (Fig. 1 and 2).

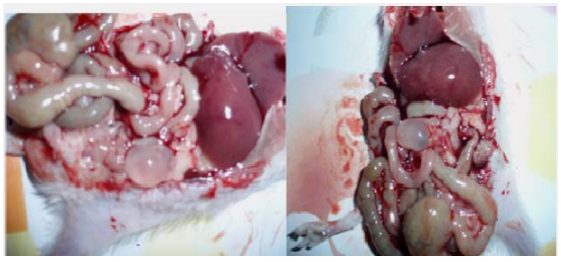

Fig. 1: Hydatic cyst into internal organs of infected rats

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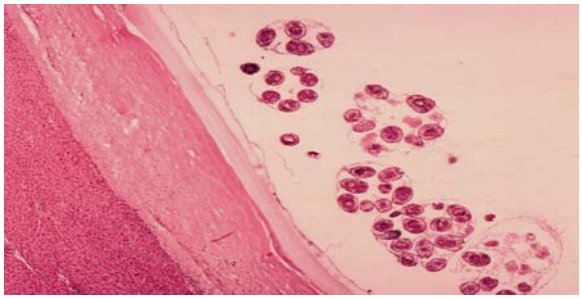

Fig. 2: Hydatic sand and protoscolex of it

RESULTS AND DISCUSSION

All results of present study in Table 1 and 2 have been shown. Table 1 and 2 shows the number of hydatic cyst in rats of control and case groups, respectively.

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; Halilolu *et al*., 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*., 2005). 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, fare some study on this subject has been done in one study by Horton (1999) study on Chemotherapy of Echinococcus infection in rat with albendazole was done and efficacy rate of this drug 46% reported. In other study by Keshmiri efficacy rate of triclabendazole on treatment of hydatic cyst 39% reported. In study by Zagirawi on Chemtherapy of Echinococcus infection in rat with triclabendazol-levamisole effect of these drugs on

Table 1: Number of hydatic cyst in control group

Infected organ	No. of hydatic cyst	Color of hydatic cyst	Diameter of hydatic 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 hydatic cyst	32.6	-	-

Table 2: Number of hydatic cyst in case group

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

treatment of lung hydatic cyst 37%, liver hydatic cyst 41% and renal hydatic 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 (Polat *et al*., 2009). 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.

CONCLUSION

Result of present study indicated that administration of triclabendazole-levamisole for hydatic cyst treatments is non sufficient in rats.

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