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Serological Studies on Hydatidosis in Camels in Saudi Arabia*

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Abstract: Two hundred camels sacrificed in Al-Muasim Abattoir at Mekka Al-Mukarama were examined for hydatidosis. Out of these, 32 (16.0%) were found to harbour hydatid cysts either in the liver, lung or both. From the latter, only two camels (6.3%) harboured fertile hydatid cysts. Twelve (37.5%) of the 32 camels found harbouring hydatid cysts were serologically positive when screened for hydatidosis by the indirect haemagglutination test (IHA). Two animals (1.2%) out of the 168 non-infected camels gave serologically false positive results. Cysticercosis was recorded in five camels (2.5%).

Key words: Hydatidosis, camels, Saudi Arabia

INTRODUCTION

Cystic echinococcosis is an important zoonosis in many countries including Saudi Arabia (Laajam and Nouh, 1991; Torgerson and Budke, 2003; Lahmar *et al*., 2004). The camel strain (G6 genotype) has been isolated from camels, cattle, humans and goats in sub Saharan Africa, China, Argentina and Nepal (McManus, 2002; Sadjjadi, 2006).

Being a common intermediate host of *E. granulosus*, hydatid cysts have been reported in camels from almost all camel-rearing countries (El-Bihari, 1986). Their prevalence varies widely reaching 61% in some areas (Njoroge *et al*., 2002). Thus, camels infected with cystic echinococcosis may represent an important source of transmission to dogs and hence indirectly to man (Lahmar *et al*., 2004).

Controlling hydatidosis by selective elimination of infected animals has been hampered by the lack of sensitive and specific methods for diagnosing this disease (Conder *et al*., 1980; Saad and Hassan, 1989). Also, early diagnosis can provide significant improvement in the qnality of management and treatment of the disease in humans (Zhang and McManus, 2006). The current study was therefore undertaken to evaluate the sensitivity and specificity of the indirect haemagglutination (IHA) test in identifying camels infected with hydatid cysts and to assess the prevalence of hydatidosis in camels sacrificed in Mekka Al-Mukarama during the Hajj season of 1423 H.

MATERIALS AND METHODS

Source of Animals and Samples for Serological Investigation

Two hundred camels sacrificed in Abattoir No. 4 in Al-Muasim were examined for hydatidosis. Lungs and livers were examined visnally and palpated for cysts. These were examined for the presence of protoscolices from which fluid was extracted and the sediment observed under a microscope for fertility and viability (Dalimi *et al*., 2002). Blood was collected from each animal during slaughter and allowed to clot for separation of serum. Serum samples were stored at -20°C till use.

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Testing of Sera

An indirect haemagglutination (IHA) test was employed to determine the prevalence of specific antibodies against hydatidosis in sera collected from 198 camels. Sera from two camels were discarded because of haemolysis. The IHA test kits were purchased from Bio-Merieux Laboratory Reagents and Products Ltd., France.

RESULTS AND DISCUSSION

Out of 200 slaughtered camels, 32.0 (16%) were found to harbour hydatid cysts either in the liver, lung or both. From the latter, ouly 2 camels harboured fertile hydatid cysts (6.3%). Cysticercosis was recorded in 5 camels (2.5%).

Twelve (37.5%) of the 32 camels found harbouring hydatid cysts were serologically positive when screened for hydatidosis by the indirect haemagglutination test. Two animals (1.2%) out of the 168 non-infected camels gave serologically false positive results (Table 1). These results indicate a sensitivity of 37.5% and a specificity of 99%. Out of five camels showing cysticercosis two were serologically positive for hydatidosis.

Although the prevalence of hydatidosis in the surveyed camels was high, fertility was extremely low. It has been reported that the proportion of fertile cysts in the camel is lower than in sheep and hydatid disease is presumed to have a domestic dog-sheep cycle with the camel contributing little or nothing to the maintenance of this cycle (El-Bihari, 1986). This assumption may not however, be quite true. Studies in slaughtered animals from Niger showed a high prevalence of hydatidosis in camels while no infection was found among sheep (Develoux *et al*., 1991). Moreover, studies in Mauritania showed that the camel strain is infectious to humans and circulates between intermediate hosts including camels and cattle (Bardonnet *et al*., 2002). Unhygienic measures used in slaughtering camels seem to act as an important source of infection with this parasite to dogs.

The results of the present study showed that the sensitivity rate for the IHA was low (37.5%). In other parts of the world, however, the reported sensitivity rates for this test were not consistent. Khan *et al*. (2001) reported that the sensitivity, specificity and efficiency of indirect haemagglutination test (as well as enzyme-linked immunosorbent assay) were low. Similar results were obtained by Saad and Hassan (1989). Hossain *et al*. (1985), however, reported that from 52 patients with suspected human hydatid disease, 30 positive cases were detected by means of serodiagnosis.

Barbieri *et al*. (1994) suggested that ultrasonography and serology for detection of levels of specific antibodies and circulating antigens should both be used to maximize the diagnostic yield in asymptomatic populations. Using native hydatid cyst fluid antigen preparations in an ELISA developed for serological detection of *Echinococcus granulosus* also seems to be a promising diagnostic tool (Ibrahem *et al*., 2002).

In conclusion, the results of the current study suggest that the IHA test caunot be considered the method of choice for diagnosis of hydatidosis in camels.

Table 1: Comparison between results of the indirect haemagglutination test and post-mortem examination in diagnosis of hydatidosis in camels

	IHA test		
Hydatidosis	Positive	Negative	Total
Positive	12	20	32
Negative	2	164	166
Total	14	184	198

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REFERENCES

Barbieri, M., M.A. Severi, M.I. Pirez, J. Battistoni and A. Nieto, 1994. Use of specific antibody and circulating antigen serum levels in the hydatid immunodiagnosis of asymptomatic population. Int. J. Parasitol., 24: 937-942.

Bardounet, K., R. Piarroux, L. Dia, F. Schneegans, A. Beurdeley, V. Godot and D.A. Vuitton, 2002. Combined eco-epidemiological and molecular biology approaches to assess Echinococcus granulosus transmission to humans in Mauritania: Occurrence of the camel strain and human cystic echinococcosis. Trans. R. Soc. Trop. Med. Hyg., 96: 383-386.

Conder, G.A., F.L. Anderson and P.M. Schantz, 1980. Immunodiagnostic tests for hydatidosis caused by *E. granulosus* and *T. hydatigena* in sheep: An evaluation of double diffusion, IEP, IHA and intradermal tests. J. Parasitol., 66: 577-584.

Dalimi, A., G. Motamedi, M. Hosseini, B. Mohammadian, H. Malaki, Z. Ghamari and F. Ghaffari, 2002. Echinococcosis/hydatidosis in Western Iran. Vet. Parasitol., 105: 161-171.

Develoux, M., J. Audoin, F. Lamothe, A. Gali and A. Warter, 1991. Human hydatidosis in Niger. J. Trop. Med. Hyg., 94: 423-424.

El-Bihari, S., 1986. The Camel in Health and Disease. Bailière Tindall, London.

Hossain, A., A.S. Bolbol and M.N. Chowdhury, 1985. Serodiagnosis of human hydatid disease in Riyadh, Saudi Arabia. Ann. Trop. Med. Parasitol., 79: 439-434.

Ibrahem, M.M., A. Rafiei, F.K. Dar, S.M. Azwai, S.D. Carter and P.S. Craig, 2002. Serodiagnosis of cystic echinococcosis in naturally infected camels. Vet. Parasitol., 125: 245-251.

Khan, A.H., A.A. El-Buni and M.Y. Ali, 2001. Fertility of the cysts of *Echinococcus granulosus* in domestic herbivores from Benghazi, Libya and the reactivity of antigens produced from them. Ann. Trop. Med. Parasitol., 95: 337-342.

Laajam, M.A. and M.S. Nouh, 1991. Hydatidosis: Clinical significance and morbidity patterns in Saudi Arabia. East Afr. Med. J., 68: 57-63.

Lahmar, S., H. Debbek, L.H. Zhang, D.P. McManus, A. Souissi, S. Chelly and P.R. Torgerson, 2004. Transmission dynamics of the *Echinococcus granulosus* sheep-dog strain (G1 genotype) in camels in Tunisia. Vet. Parasitol., 121: 151-156.

McManus, D.P., 2002. The molecular epidemiology of *Echinococcus granulosus* and cystic hydatid disease. Trans. R. Soc. Trop. Med. Hyg., 96: 151-157.

Njoroge, E.M., P.M. Mbithi, J.M. Gathuma, T.M. Wachira, P.B. Gathura, J.K. Magambo and E. Zeyhle, 2002. A study of cystic echinococcosis in slaughter animals in three selected areas of Northern Turkana, Kenya. Vet. Parasitol., 104: 85-91.

Saad, M.B. and A.K.M. Hassan, 1989. Indirect Haemagglutination (IHA) and immunoelectrophoresis in the diagnosis of hydatidosis in Sudanese camels. Rev. Elev. Med. Vet. Pays. Trop., 42: 41-44.

Sadjjadi, S.M., 2006. Present situation of echinococcosis in the Middle East and Arabic North Africa. Parasitol. Int., 55: S197-202.

Torgerson, P.R. and C. Budke, 2003. Echinococcosis-an international public health challenge. Res. Vet. Sci., 74: 191-202.

Zhang, W. and D.P. McManus, 2006. Recent advances in the immunology and diagnosis of Echinococcosis. FEMS Immunol. Med. Microbiol., 47: 24-41.