Detection of *Toxoplasma gondii* Antibodies and Some Helminthic Parasites in Camels from Nevsehir Province of Turkey

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ABSTRACT

This study was conducted on 11 camels, ranging in age from 2 months to 40 years. The aim of this study was to detect the *Toxoplasma gondii* antibodies and helminth parasites in camels. *T. gondii* antibodies were detected by Sabin-Feldman Dye Test (SFDT), and faecal samples were examined by Fulleborn flotation and Benedek sedimentation methods. As a result of the study, *T. gondii* antibodies were detected in 10 out of 11 (90.9%) camels. Detected helminths consisted of 63.63% (7/11) *Trishostrongyloidea* spp., 45.45% (5/11) *Trichuris* spp. and 9.09% (1/11) *Dicrocoelium dendriticum*.

Key words: Camel, helminth, *Toxoplasma gondii*, Turkey.

INTRODUCTION

According to 2009 statistics, the camel population in Turkey was 1041. Camels suffer from various endo- and ectoparasitic diseases which cause economic losses such as decreased working capacity, growth and production (1, 2).

Data related to camel parasites in Turkey are very limited. *Trichostrongylidae* spp., *Trichuris* spp., *Dicrocoelium dendriticum*, *Eimeria* spp., *Dipetalonema evansi*, *Hydatid cysts* and *Cephalopina titillator* are known camel parasites in Turkey (3, 4, 5, 6). However, we could not find any reports in Turkey with respect to the existence of *T. gondii* antibodies in camels. The aim of this study was to detect the *T. gondii* antibodies and helminth parasites of camels in Nevsehir province of Turkey.

MATERIAL AND METHODS

Sample collection

In this study, a total of eleven camels (8 male and 3 female), ranging in age from 2 months to 40 years, were examined. Blood and fecal samples were collected from the camels in June 2010 from Nevsehir province of Turkey. Blood samples were taken from the jugular vein without anticoagulant and left to clot overnight at 4°C. Sera were removed after centrifugation at 2000 rpm for 5 minutes, decanted into 1.5 ml plastic tubes and stored at -20°C until use.

Coprologic and serologic examination

Faecal samples were taken from the rectum, collected in glass bottles and transported to the laboratory on ice. Faecal samples were processed and examined microscopically on the same day. The Sabin-Feldman Dye Test (SFDT) (7) was carried out at Ankara Refik Saydam National Hygiene Center to detect anti-*T.gondii* antibodies. 1:16 and greater titers were accepted as positive.

Faecal samples were examined by conventional Fulleborn flotation and Benedek sedimentation methods. The ova identification was carried out according to Soulsby and Kassai (8, 9).

RESULTS

At the end of the study, it was found that 9 out of 11 (81.81%) camels were infected by one or more species of worms. Detected helminthes consisted of 63.63% (7/11) *Trishostrongyloidea* spp., 45.45% (5/11) *Trichuris* spp. and 9.09% (1/11) *D. dendriticum*. Furthermore, we detected anti-*T. gondii* antibodies in 10 out of 11 (90.90%) samples. The percentages were 87.50% (7/8) in males and 100% (3/3) in females. Study results are presented in Table 1 and Table 2.

Table 1: Incidence of helminthes in camels

Parasites	Total samples	Infected animal	Percentage (%)
Trishostrongyloidea spp.	11	7	63.63
Trichuris spp.	11	5	45.45
D.dendriticum	11	1	9.09

DISCUSSION

Bajana *et al*. (10), Aypak (11), and Parsani (1) reviewed the parasites of camels. According to these researchers, camels' common gastrointestinal nematodes are *Haemonchus*, *Nematodirella*, *Nematodirus*, *Trichostrongylus*, *Strongyloides*, *Ostertagia*, *Marshallagia*, *Cooperia*, *Trichuris* and *Camelostrongylus*. Among extra intestinal nematodes *Onchocerca fasciata*, *O. armilata*, *O. gutturosa*, *D. evansi*, *Thelazia leesi*, *Dictiyocaulus cameli*, *Protostrongylus* spp., *Cystocaulus* spp., *Muellerius* spp., have been reported in camels. Trematodes of major importance in camels are *Fasciola gigantica*, *F. hepatica*, *Schistosoma* spp., *Eurytrema pancreaticum*, *D. dendriticum* and *Paramphistomum* spp. Cestodes reported in camels are *Moniezia* spp., *Stilesia* spp., *Avitellina* spp., *Tysanosoma actinioides*, *Hydatid cyst*, *Cysticercus tenuicollis*, *C. dromedarii* and *Coenurus cerebralis*. Various protozoan parasites, *Trypanosoma evansi*, *Theileria* spp., *Sarcocystis* spp., *T. gondii*, *Balantidium coli* and *Eimeria* spp., have been reported in camels.

Merdivenci (4), found *D. evansi* from the connective tissue of camel testis in Mersin, a province in southern Turkey. Dincer *et al*. (6), identified *C. titilator* in the nostril of one camel in Aydin, a province in western Turkey. At the same province, Eren *et al*. (3), studied on 150 camels and found the prevalences of *Trichostrongylidae* spp., 38.66%, *Trichuris* spp., 10.66%, *D. dendriticum* %7.33, *Eimeria* spp., 4.66%. They reported that 2 of 6 slaughtered camels were infected with *Hydatid cysts*. Utuk *et al*. (5), found hydatid cysts in one camel from Sanliurfa, a southeastern province of Turkey. For further discrimination, they examined the cyst material by Polymerase Chain Reaction-Restriction Fragment Length Polymorphism (PCR-RFLP) and DNA sequencing. Obtained sequence data were identified as corresponding to the common sheep strain (G1) of *Echinococcus granulosus*. In this study, we studied on 11 camels and detected *Trishostrongyloidea* spp., 63.63% (7/11) *Trichuris* spp. 45.45% (5/11) and 9.09% (1/11) *D. dendriticum*.

Toxoplasma gondii antibodies in camel sera were reported from Saudi Arabia, mid-Eastern Sudan and Egypt. Seroprevalence of *T. gondii* in these countries were 16% (227/366), 67% (327/482) and 17.4% (29/166), respectively (12, 13, 14). However, we could not find any report in Turkey with respect to the existence of *T. gondii* antibodies in camels. In this study, we detected *T. gondii* antibodies in 10 out of 11 (90.9 %) camels.

Study results indicated that helminth infections and *T. gondii* antibodies are prevalent among camels in Nevsehir. By comparison with other farm animals, high prevalence of *T. gondii* cannot be a public health problem in Nevsehir, as camels are bred only for touristic purposes. At the end of the study, we gave information to camel owners with regard to treatment, protection and importance of parasitic diseases. We consider that further studies in camels should be conducted in different seasons and at different parts of Turkey.

Table 2: Number of male and female camels seropositive to *T. gondii* at different dilutions

Sex	No of animals	Negative	Positive	Percentage	Titers of Seropositivity		
					1/16	1/64	1/256
Male	8	1	7	87.50	3	3	1
Female	3	0	3	100.0	1	1	1
Total	11	1	10	90.90	4	4	2

REFERENCES

1. Parsani, H.R., Singh, V. and Momin, R.R.: Common parasitic diseases of camel. Vet. World. 1: 317-318, 2008.
2. Turkish Statistical Institute, http://www.tuik.gov.tr/Start.do Accessed on 21 January 2011.
3. Eren, H., Aypak, S. and Selek, N.: Prevalence of parasites detected by faecal examinations in camels (*Camelus dromedarius*) in Aydin area. Y. Y. Ü. Vet. Fak. Derg. 14: 59-60, 2003.
4. Merdivenci, A.: Türkiye Parazitleri ve Parazitolojik Yayinlari. Kutulmuş Matbaasi, Istanbul, Turkey, 1971.
5. Utuk, A.E., Simsek, S., Koroglu, E. and McManus, D.P.: Molecular genetic characterization of different isolates of *Echinococcus granulosus* in east and southeast regions of Turkey. Acta Trop. 107: 192-194, 2008.
6. Dinçer, Ş., Yildiz, K. and Nalbantoğlu, S.: The first report of a larva of *Cephalopina titilator* (Diptera:Oestridae) on a camel (*Camelus dromedarius*) in Turkey. Türkiye Parazitol. Derg. 24: 311-312, 2000.
7. Sabin, A.B. and Feldman, H.A.: Dyes as microchemical indicators of a new immunity phenomen affecting a protozoon parasite (*Toxoplasma*). Science. 108: 660-663, 1948.
8. Soulsby, E.J.L.: Helminths, Arthropods and Protozoa of Domesticated Animals. 7th edition, Baillier, Thindall, London, 1968.
9. Kassai, T.: Veterinary Helminthology. Oxford, Auckland, Boston, Johannesburg, Melbourne, New Delhi, 1999.
10. Banaja, A. A. and Ghandour A. M.: A review of parasites of camels (*Camelius dromedarius*) in Saudi Arabia. J.K.A.U. Sci. 6: 75-86, 1994.
11. Aypak, S.: Helminth infection of camels. Türkiye Parazitol. Derg. 31: 225-228, 2007.
12. Hussein, M. F., Bakkar, M. N., Basmaeil, S. M. and Gar El Nabi, A. R.: Prevalence of Toxoplasmosis in Saudi Arabian camels (*Camelus dromedarius*). Vet. Parasitol. 28: 175-178, 1988.
13. Elamin, E. A., Elias, S., Daugschies, A. and Rommel, M.: Prevalence of *Toxoplasma gondii* antibodies in pastoral camels (*Camelus dromedarius*) in the Butane Plains, Mid-Eastern Sudan. Vet. Parasitol. 43: 171-175, 1992.
14. Hilali, M., Romand, S., Thulliez, P., Kwok, O. C. H. and Dubey, J. P.: Prevalence of *Neospora caninum* and *Toxoplasma gondii* in sera from camels from Egypt. Vet. Parasitol. 75: 269-271, 1998.