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Toxoplasma gondii INFECTION IN CAMELS (*Camelus dromedarius*): A SEROLOGIC ASSAY IN IRAN

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ABSTRACT

Serum samples from 310 camels of Isfahan province of Iran were tested with indirect immuno-fluorescent antibody test (IFAT) to detect antibodies against *T. gondii*. Among examined sera, 87 (28.06%) had anti-*T. gondii* antibodies detectable in titres of 1:16 to 1:256. High seroprevalence of this infection in this area of Iran suggests the possible role of *T. gondii* in camel health and as a potential zoonotic risk in this region.

Key words: *Camelus dromedarius*, Iran, Isfahan, *Toxoplasma gondii*

The camel population in Iran is more than 145,000 among which a high percentage is kept in central provinces and belongs to *Camelus dromedarius* (Al-Ani, 2004). These animals play a relatively important economic role in these areas as a meat source.

T. gondii is a widespread, cyst-forming coccidian parasite that can cause severe disease in human and domestic animals. Whilst domestic cats and wild felines are the only definitive hosts, a wide range of intermediate hosts, including camelids have been described (Chavez-Velasquez *et al,* 2005).

Clinical toxoplasmosis in camels (Hagemoser *et al,* 1990) as well as isolation of *T. gondii* from camel meat (Hilali *et al,* 1995) have earlier been documented.

Camelus dromedarius are suggested to be potential intermediate hosts for *T. gondii* (Bornstein and Musa, 1987; Elamin *et al,* 1992; Hilali *et al,* 1998; Abu-Zeid, 2002, Sadrebazzaz *et al,* 2006).

In present report *Toxoplasma gondii* infection was diagnosed in camels through a serologic assay.

Materials and Methods

Blood samples were collected from 310 camels from slaughterhouses in Isfahan province, Iran and centrifuged immediately. Collected sera samples were kept at -20°C until tested.

RH strain of *T. gondii* were maintained *in vero* cell cultures and purified as previously described for closely related protozoa; *N. caninum* (Schares *et al,* 1998). Cell culture derived tachyzoites were used immediately for preparation of indirect immuno-fluorescent antibody test (IFAT) slides.

Serum samples were diluted 1:16 using phosphate buffer saline (PBS) pH 7.4 and IFA test was performed. Positive samples were diluted 2 times more and tested again until being negative.

Results

Among 310 samples, *T. gondii* antibodies were detected in 87 (28.06%) serum samples among which 46 samples (14.83%) had detectable antibodies in dilution of 1:16, and 20 (6.45%), 12 (3.87%), 7 (2.25%) and 2 (0.64%) in dilutions of 1:32, 1:64, 1:128 and 1:256, respectively.

Discussion

Most of *T. gondii* infections in camels are asymptomatic, however, a few clinical reports of the disease are also present (Hagemoser *et al,* 1990). Isolation of parasitic cysts from some camels indicates that the consumption of under-cooked camel meat is a human health hazard owing to possible infection with this parasite (Hilali *et al,* 1995).

Seroprevalence was estimated as 16% in Saudi Arabia (Hussein *et al,* 1988) and 17.4% in Egypt (Hilali *et al,* 1998). High seroprevalence of this protozoa in domestic cats in many countries suggests their role as a source of infection for intermediate hosts (Haddadzadeh *et al,* 2006; Hornok *et al,* 2008).

Acute toxoplasmosis was reported in a 6 year old camel with a history of dyspnoea of unknown origin and numerous *T. gondii* tachyzoites were

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detected in macrophages in smears of the pleural fluid with a high titre (1:20000) of *T. gondii* antibodies (Hagemoser *et al*, 1990).

T. gondii has been isolated from camel meat, using cat bioassays where tissue samples were collected from the oesophagus and tongue of camels. This study showed the potential zoonotic importance of the parasite in these animals (Hilali *et al*, 1995).

Relatively high seroprevalence of *T. gondii* in this area of Iran, suggests the necessity of further research to minimise production losses and zoonosis.

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