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NATURAL TRYPANOSOMOSIS IN A BACTRIAN CAMEL (*Camelus bactrianus*) IN IRAN

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ABSTRACT

In September 2008, a six-year-old female bactrian camel (*Camelus bactrianus*) with weakness, diarrhoea and emaciation was examined in the suburb of Tehran. Haematological analysis revealed a haemolytic anaemia, accompanied by decrease in RBC, Hb and PCV. Differential count indicated remarkable leukocytosis, lymphocytosis and monocytosis. Microscopic examination of Giemsa-stained blood smears showed a few trypanosomes. For detection of trypanosome, three laboratory-bred mice were inoculated intraperitoneally with 1 ml of blood of the camel. Parasitaemia was detected in mice after 1 week. The camel was treated by single intramuscular injection of diminazene aceturate at dose of 3.5 mg/kg. Two months after treatment the camel was in good condition. This is the first report of trypanosomosis in a Bactrian camel in Iran.

Key words: Bactrian camel, natural infection, surra, trypanosomosis

The most important protozoal disease of camels is trypanosomosis (surra), caused by *Trypanosoma evansi* (Kinne *et al*, 2001). This parasite is widespread throughout tropical and subtropical areas. However, in Africa, where camels may contact tsetse-transmitted trypanosomes, infections may also occur with *T. brucei*, *T. congolense*, *T. vivax* and *T. simiae* (Wernery and Kadeen, 2002). *T. evansi* may affect many different species of mammals. The disease is most severe in horses, donkeys, mules, deer, camels, llamas, dogs and cats, and occasionally it occurs in sheep, goats, pigs and Indian elephants as a mild or subclinical infection. In addition there have been reports of *T. evansi* infections in tigers, foxes, tapirs, and orangutans (Wernery and Kadeen, 2002). Surra has a wide distribution in areas of Africa north of the tsetse belt and in the Middle East, Asia, and Central and South America (Radostits *et al*, 2007). *T. evansi* is transmitted by a number of species of haematophagous biting flies (Chaudhary and Iqbal, 2000). The form of the disease may be acute, subacute, chronic or inapparent, but generally chronic form is the most common (Ngaira *et al*, 2003). Trypanosomosis can be confused with any other chronic wasting disease, notably helminthosis and malnutrition (Wernery and Kadeen, 2002).

Case report

In September 2008, a six-year-old female bactrian camel with weakness, diarrhoea and emaciation was examined in the suburb of Tehran. According to history, this condition was present for two months with intermittent relapses. Oxytetracycline and multivitamin were already administered by the owner.

Clinical examination revealed a depression, rectal temperature of 38.9°C, a pulse rate of 57 beats per minute and a respiratory rate of 16 breaths per minute.

Haematological analysis revealed a packed-cell volume 15.5 per cent (normal range 25 to 39 per cent), 5.7×10^9 red blood cells (RBCs)/litre (normal range 8.5 to 13.4 RBCs/litre), haemoglobin 8.4 gram/decilitre (normal range 11.1 to 17.4 gram/decilitre), mean corpuscular volume (MCV) 27 femtolitre (normal range 25.3 to 31.6 femtolitre), mean corpuscular haemoglobin (MCH) 14.7 picograms (normal range 10.6 to 14.3 picograms), mean corpuscular haemoglobin concentration (MCHC) 54 per cent (normal range 37 to 47 per cent), 37.7×10^9 white blood cells (WBCs)/litre (normal range 8.6 to 16.5×10^9 WBCs/litre), 8.7×10^9 neutrophils/litre (normal range 4.7 to 13×10^9 neutrophils/litre), 25.6×10^9 lymphocytes/litre (normal range 1.5 to 5.4×10^9 lymphocytes/litre), 3×10^9 monocytes/litre (normal range 0 to 0.7×10^9 monocytes/litre) and 0.410^9 eosinophils/litre (normal range 0 to 1.5×10^9 eosinophils/litre) (Moore, 2000).

Microscopic examination of Giemsa-stained blood smears showed a few trypanosomes (Fig 1). For

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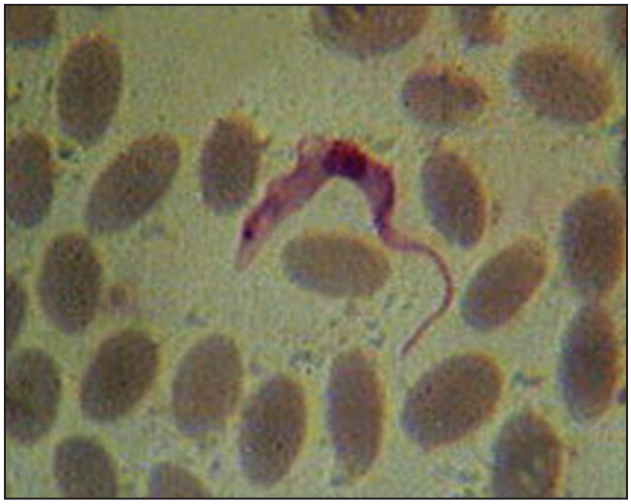

Fig 1. Trypanosome parasite in bactrian camel blood.

detection of trypanosomes, three laboratory-bred mice were inoculated intraperitoneally with 1 ml of blood of the camel. Parasitaemia was detected in mice after 1 week (Fig 2).

The camel was treated by single intramuscular injection of diminazene aceturate (Vetaminazene 7%, Aburaihan Pharmaceutical Co., Iran) at dose of 3.5 mg/kg. Two months after treatment the camel was in good condition. Mouse inoculation test was repeated and there was no evidence of parasitaemia. This is the first report of trypanosomosis in a bactrian camel in Iran.

Discussion

The population of bactrian camels in Iran is about 156 (Niasari, 2009, personal communication) and most of them were maintained in Ardebil province in northwest of Iran.

In this report, infection with trypanosome was demonstrated in a bactrian camel. Definitive diagnosis of a current infection with trypanosome relies on the demonstration of the parasites in the blood or tissue fluids of infected animals. However, in camel, parasite detection techniques are not always successful as the level of parasitaemia is often low and fluctuates, particularly during the chronic stage (Singh *et al*, 2004). Inoculation of laboratory rodents with blood from suspected infectious camels is a very sensitive method for detecting low parasitaemia caused by *T. evansi* (Jain *et al*, 2000). Unfortunately specific DNA probes of trypanosomes were not available and we could not identify the trypanosome species through PCR. However, in Iran, where camels do not contact tsetse-transmitted trypanosomes, infections occur with *T. evansi*.

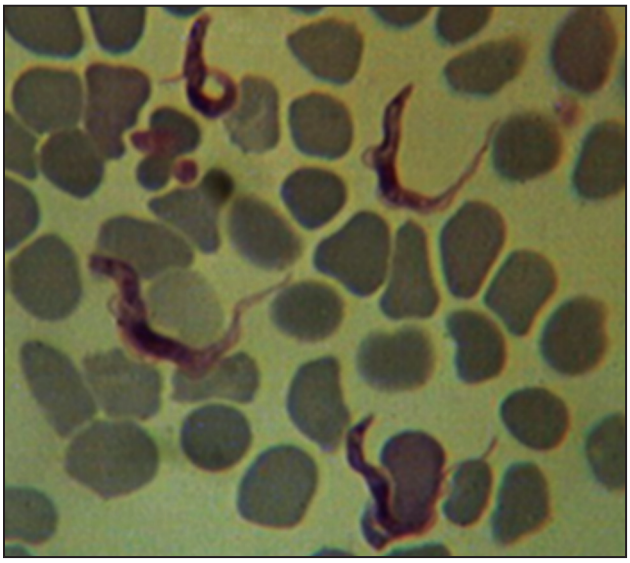

Fig 2. Trypanosome parasites in mouse blood.

Haematological analysis revealed a haemolytic anaemia, accompanied by decrease in RBC, Hb and PCV. Differential count indicated remarkable leukocytosis, lymphocytosis and monocytosis. Wernery and Kadeen (2002) described a macrocytic and haemolytic anaemia with a decrease in erythrocytes and an increase in lymphocytes, eosinophils and monocytes in camels infected with *T. evansi*. Chaudhary and Iqbal (2000) have reported a significant decrease in RBC, Hb, PCV and lymphocytes while a significant increase in WBC and neutrophils in natural trypanosomosis positive samples in racing dromedary camels. Zia-ur-Rehman (1992) has reported the marked neutropenia, lymphocytosis and eosinophilia in one humped camels infected with surra. It can be attributed to the fact that if the camels are looked after very carefully and the disease is diagnosed in early stages and is immediately treated and seldom run chronic course (Chaudhary and Iqbal, 2000). In the chronic trypanosomosis depression in the immune system has been reported (Njiru *et al*, 1997).

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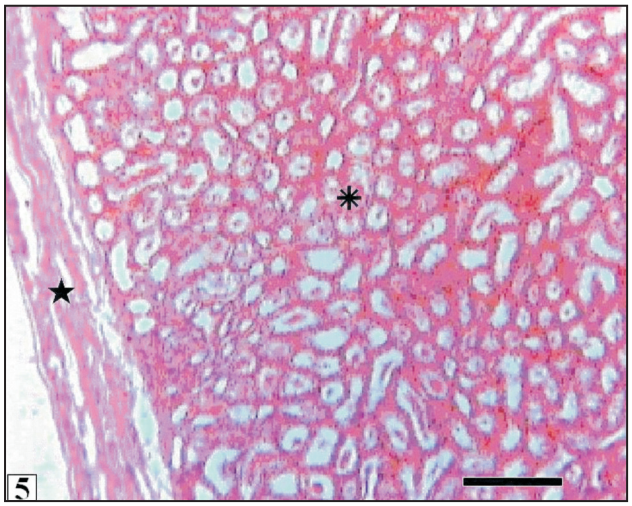

Fig 5. Cortex. Capsule (★). Cortical labyrinth (✳). H&E. Bar=250µm.

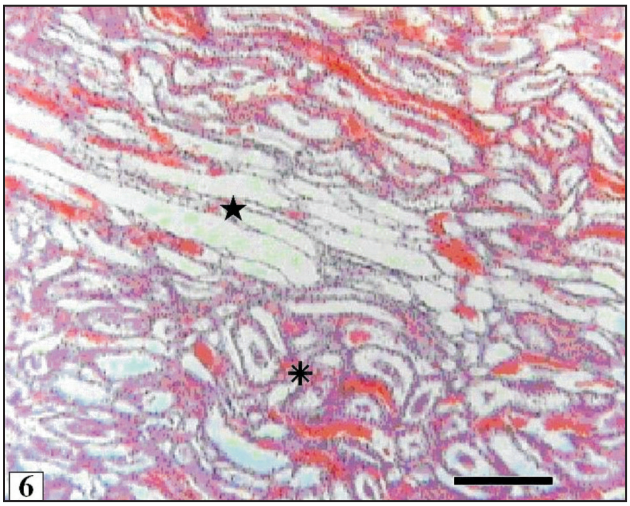

Fig 6. Outer zone of medulla (longitudinal section). Vascular bundle of vasa rectae (★). Uriniferous tubule bundle (✳). H&E. Bar=100µm.

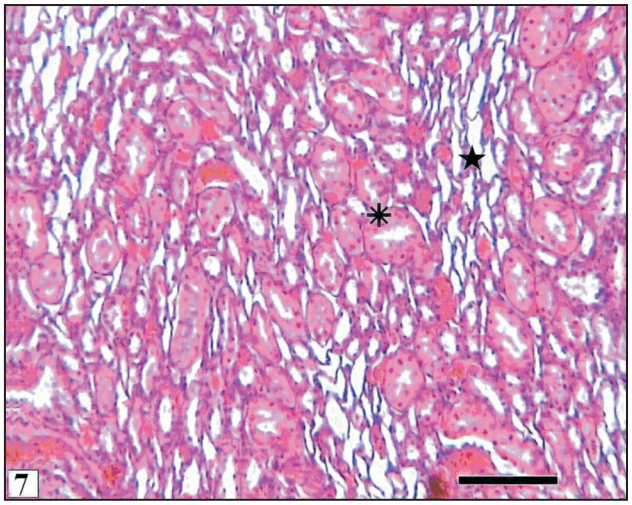

Fig 7. Outer zone of medulla (cross section).Vascular bundle of vasa rectae (★). Uriniferous tubule bundle (✳). H&E. Bar=100µm.

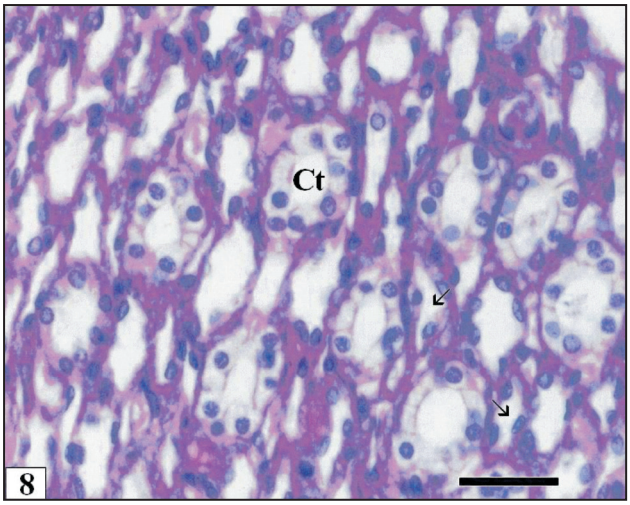

Fig 8. Inner zone of medulla. Thin segment (arrows). Collecting tubule (Ct). H&E. Bar=50µm. These Figures above had been checked.