Seroprevelance study of *Toxoplasma gondii* in horses and camels animal in Wasit province

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Summary

The aim of this study was to investigate the seroprevelance of *Toxoplasma gondii* in camels and horses in Wasit province and to determine the seroprevalence of Toxoplasmosis in certain animals farm in Wasit province, also this study included the extent of the disease in camels and horses within two months starting from the January until February of 2015. A total of 184 samples were collected of them 92 horses and 92 camels. The results showed that the incidence of *Toxoplasma gondii* in horses was 18.4%, in camels 20.6% and the infection percentage of females were more than that males in both horses and camels 21.1 and 20.2%, respectively. Also the present results revealed that younger animals infections were more than in older animals; as well, the percentage of infection in January was more than the incidence in February in each of the horses and camels.

Keywords: Toxoplasmosis, *Toxoplasma Gondii* in horses, Camels.

Introduction

Toxoplasmosis is a zoonotic disease caused by the protozoan parasite *Toxoplasma gondii*; human and other warm blooded animals act as its hosts (1). The infection has a worldwide distribution; approximately one-third of all human being have been exposed to this parasite, but the seroprevalence varies considerably between countries (from less than 10% to more than 90%) and population group (2**)**. *Toxoplasma. Gondii* (*T. gondii*) is an obligate intracellular protozoan parasite (3). *T. gondii* is a protozoan parasite which belongs to the phylum *Apicomplexa*, subclass *Coccidiasina* and family *Sarcocystidae* (4). In Iraq, there are large numbers of camels and horses which are important economically and health importance. Little information's about toxoplasmosis in camels and horses were recorded in Iraq, and due to their economic and health importance, the aim of this study was to evaluate the seroprevelance of *Toxoplasma gondii* in camels and horses in Wasit province.

Materials and Methods

A total of 184 blood samples were collected (92 samples from camels and 92 samples form horses). Blood sample 10 ml was collected from jugular vein. The collected blood was kept in tube to enhance complete clotting, then put in incubator at 42°C to the next day, serum was separated from clot by using centrifuge at 3000r/min for 10 min. serum was heat a plastic tube (screw tube) and marked by number and stored at (-18 ºC).The information of samples which includes the case history, sex, age and region, were documented in a special notebook for this purpose**.** The enzyme linked immuno sorbent assay (ELISA) was used for the detection of IgG antibodies for *Toxoplasma gondii* in camels and horses.

Results and Discussion

Distribution of *T. gondii* in horses by using ELISA according to residence area: The results of this study observed seropositive in Albattar (13.04 %), Shikh Saad (34.7%), Alflahia (34.7%) and Shazi (8.6%), (Table, 1). These results disagreed with other scientific studies recorded in other countries', with few exceptions horses were considered one of the less sensitive species to the pathogenic effect of *Toxoplasma gondii* (5). However, when infected the parasite is considered to be associated with encephalomyelitis in horses. This results agreement with (6) which revealed that (17.7%) of the 158 horses with titers. The serological study of this parasite has previously been conducted only in two African countries, Nigeria and Egypt. In the Nigeria, the overall rate of anti-*toxoplasma* antibodies, exceeds 30% among Polo horses, local breed and the Argentine breed (7). While In the Egypt a first study reported an upper rate of 40% (8).

Table, 1: Percentages of positive ELIZA test for *T. gondii* in horses sera according to residence areas.

Area	No. of Sera tested	Seropositive (%)
Albattar	23	3(13.04 %)
shaykh saad	23	8(34.7%)
Alflahia	23	8(34.7%)
Shazi	23	2(8.6%)
Total	92	17 (18.4%)

Also the present results disagree with other researchers who reported that the percentage in India (10.8%) (9), in Egypt (27.9%), and in Saudi Arabia (16%) using IHAT. This difference could be due to environment conditions and different tests used. In Arab area, the seropositive was 2% in Saudi Arabia using IHAT (10) in Iraq 48% using complement fixation test CFT (11). In Egypt using IHAT in 1990, 21% was obtained and on (1997) prevalence reached 49% (12) the variation of the results could be due to the samples size of different studies also, the different methodology used.

The results of genders in this study were showed in male (0%) and female (20.2%) affected prevalence of infection (Table, 2). These results disagreement with (6) which showed a difference in the subgroups of female and male horses was also significant. Indeed, the female horses had a significantly lower seroprevalence, (13.9%: 6 from 43) than the male, (19.1%: 22 from 115).

Distribution of *T. gondii* by using ELISA according to Gender: Results reported in males (0%) and in females (21.1%), were agreed with (13) (20.6%), (Table, 3) and this were disagreed with (14). The toxoplasmosis in camels was studied in India by dye test (DT), and indirect heamoagglutination test (IHAT) in which reported 11.1 and 10.8%, respectively. While In Egypt, was reported 27.9% (15), and In Saudi Arabia, 16% by using IHAT (16). The toxoplasmosis could be as a zoonotic disease transmitted to humans through raw meat and raw milk consumption. Camel meat consumption habit showed that 67.7% consume cooked meat and the rest 32.3% consume either cooked or uncooked meat. This might indicate actively circulating, recently acquired or recrudescence of previously acquired *T. gondii* infection in camels of the study area due to climatic stress, malnutrition and prevalent diseases like trypanosomosis (17) which reduce the animals' resistance (18). The seropositive tests in horses were (26.08%) in January and (10.8%) in February (Table, 4), these results agree with (19) who reported a variation in antibody titration between seasons, when the most positive 72.5% samples were in the dry season comparing with the wet season.

Table, 2: Prevalence of *T.gondii* in horses by using ELISA according to Gender.

Gender	No. of Tested	Positive (%)
Male	8	(0%)
Female	84	17(20.2%)
Total	92	17 (18.4%)

Table, 3: Prevalence of *T.gondii* in camels by using ELISA according to Gender.

Gender	No. of Tested	Positive (%)
Male	2	(0%)
Female	90	19(21.1%)
Total	92	19 (20.6 %)

Table, 4: Distribution of *T.gondii* in horses by using ELISA according to according to the months.

Month	No. of sera tested	Seropositive (%)
January	46	12(26.08%)
February	46	5(10.8%)
Total	92	17(18.4%)

While the seropositive in camels were (23.9%) in January and (17.3%) in February. (Table, 5) these results were agreed with (20) who mentioned that camels suffer from various parasitic diseases, including toxoplasmosis, which have public health and economic importance.

Table, 5: Distribution of *T.gondii* in camels by using ELISA according to according to the months.

Month	No. of sera tested	Seropositive (%)
January	46	11(23.9%)
February	46	8(17.3%)
Total	92	19(20.6%)

Distribution of *T. gondii* by using ELISA according to Age group: The results were showed that the seropositive in horses was

26% in <1-3 years and 9.5% in 4-6 years, (Table, 6) these results were consisted with (6 and 19), which provided further evidence for the increased risk of *T. gondii* infection with acquisition of age through longer contact with infective oocysts from the environment. Although toxoplasmosis generally causes subclinical infections in horses, it might also lead to symptoms including progressive neurological findings such as ataxia, paralysis, blindness, fever, retinal degeneration and severe encephalomyelitis. A case of an infection in eye of aborted foals in UK has been reported.

Table, 6: Prevalence of *T.gondii* in horses by using ELISA according to age group.

Group Age	No. of Sera Tested	Seropositive (%)
<1-3 years	50	13(26%)
4-6 years	42	4(9.5%)
Total	92	17(18.4%)

The results showed that the seropositive in camels were in age group <1-3 years was 22% while in 4-6 years the percentage 19.04%, (Table, 7) these was disagreed with (16) (34.26%) in young and (52.97%) in order, the seroprevalence of *T. gondii* infection was higher in camels oduif than 8 years as compared to camels ≤ 4 years old. Thus, the probability of *T. gondii* infection in camels increases as the age progresses of the animal this suggesting postnatal infection. The high seroprevalence in older camels than young camels might be due to the higher likelihood progresses of exposure of older camels to any one of the risk factors to acquire *T. gondii* infection (21) this finding is in harmony with the studies conducted in Saudi Arabia (22) who reported a higher seroprevalence in adult than young camels.

Table, 7: Prevalence of *T. gondii* in camels by using ELISA according to age group.

Group Age	No. of Sera Tested	Seropositive (%)
<1-3 years	50	11(22%)
4-6 Years	42	8(19.04 %)
Total	92	19(20.6%)

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دراسة وبائية لداء المقوسات القندية في الخيول والجمال في محافظة واسط

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الخلاصة

هدفت هذه الدراسة إلى التعرف على الانتشار المصلي من التوكسوبلازما كاندي في الجمال والخيول في محافظة واسط ولتحديد الانتشار المصلي لداء المقوسات في بعض حيوانات المزرعة في المحافظة، وكذلك شملت الدراسة على مدى انتشار المرض في الجمال والخيول في شهرين بدأت من يناير حتى فبراير من عام 2015. جُمِعَت 184 عينة (92 الخيول و92 الإبل). أظهرت النتائج أن حدوث التوكسوبلازما كاندي في الخيول بنسبة (18.4٪) وفي الإبل (20.6٪) ونسبة إصابة الإناث أكثر من الذكور في كل من الخيول والجمال (21.1 و 20.2٪) على التوالي. كما كشفت نتائجنا أن الأعمار الصغيرة أكثر اصابة من الأعمار الكبيرة وكذلك نسبة الإصابة في كانون الثاني اكثر من الإصابة في شباط في كل من الخيول والجمال.

الكلمات المفتاحية: داء المقوسات، توكسوبلازما كاندي في الخيول، الجمال.