



Serosurveillance on Toxoplasmosis in Camels (*Camelus dromedarius*) at Al-Najaf Province

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Abstract

The current study was conducted to evaluate the seroprevalence of toxoplasmosis in camels resident in Al-Najaf province in Iraq . Serum samples were collected from 360 camels, 219(60.83%) of samples represents males and 141(39.16%) were collected from females. Latex Agglutination Test(LAT) was applied to screen all serum samples for Toxoplasmosis while ELISA was also used to confirm the positive result obtained by LAT Using LAT, out of 360 serum samples 91 (25.2%) were positive to *Toxoplasma gondii*. Percentage of positive cases was more in females (30.4 %) than it is in males (21.9 %); the percent of seropositivity increased by increasing animals age. The ELISA test showed that 15 (16.4 %) samples were positive for toxoplasmosis, the males were 7 (14.5 %) which was lower than the percentage in females 8 (18.6 %). Also the percentage of positivity increased with increasing animals age.

Key words: Camels; Toxoplasmosis; Latex Agglutination Test (LAT). Enzyme Linked Immunosorbent Assay (ELISA) .

التحري مصلياً عن داء المقوسات الكونية في الإبل في محافظة النجف

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الخلاصة:

أجريت هذه الدراسة لأجل التحري عن الأجسام المضادة للتوكسوبلازما في مصول الإبل المتواجدة في مناطق محافظة النجف في العراق. جمعت 360 عينة 219 (60.83%) من الذكور و141 (39.16%) من الإناث وبأعمار مختلفة. لأجل التحري عن الأجسام المضادة للتوكسوبلازما استخدم اختبار اللاتكس التلازني كاختبار مسحي لجميع العينات وايضاً استخدم اختبار الاليزا الغير مباشر كفحص توكيدي لفحص العينات الموجبة لاختبار اللاتكس التلازني و إن 91 (25.2%) من المجموع الكلي للعينات أظهرت أجساماً مضادة موجبة لطيفلي التوكسوبلازما باستعمال اختبار اللاتكس التلازني. وكانت نسبة الإصابة في الإناث 30.4% أكثر منها في الذكور 21.9% وقد لوحظ إن نسبة الإصابة تزداد مع تقدم العمر. أما اختبار الاليزا غير المباشر الخاص بطيفلي التوكسوبلازما والذي اجري على العينات الموجبة لفحص اللاتكس التلازني فقد أظهرت تفاعلاً موجباً مع 15 (16.4%) عينة فقط. كانت نسبة الحالات الموجبة في الذكور 7 (14.5%) وهي اقل من نسبة الإصابة في الإناث 8 (18.6%) وان ازدياد نسبة الإصابات تزداد بازدياد عمر الحيوانات.

Introduction:

Camels are susceptible, the same as other livestock to the common disease causing pathogens affecting other animal species (1; 2).

Toxoplasmosis is a zoonotic disease caused by the protozoan parasite *Toxoplasma gondii* are widely prevalent in human and other domestic animals and distributed globally (3).

Reports refers to widespread prevalence of Toxoplasmosis among camels, in Iraq (4,; 5;6) with different infection rate 6.04%,16.35% and 20.34%. among different years 1998,2006 and 2012 respectively. Moreover in Saudi Arabia rate of 13.6% have been detected in 2012 (7). Furthermore 4% infection rate with Toxoplasmosis were registered in Iran in 2006 (8).

Materials and Methods

Three hundred and sixty blood samples (represent 219 males &141 females) were collected by jugular vein puncture from each animal during December - 2011 to May -2012 , in sterile tubes without anti-coagulant and labeled by codes describing the specific animal. Samples were centrifuged at 3000 r.p.m. for 10 minutes. Sera were separated and allotted in eppendorf tubes (1.5 ml) samples were kept at -20 and stored for further analysis. 310 of these samples collected from Al-Najaf abattoir and another 50 samples collected from Al-Najaf desert, animals were of age ranged between(1-10 years).

Latex agglutination test Toxo-Latex ® (SPINRER EACT, S. A. Ctra. Santa coloma, Spain) was used to screen the sera basically. The TOXO-Latex reagent is a suspension of polystyrene latex particles coated with soluble *T. gondii*

antigen. Latex particles allow a visual observation of the antigen-antibody reaction. If the reaction occurs, latex suspension changes and a clear agglutination becomes evident, due to the presence of *Toxoplasma* antibodies upper than 4 IU/ml.

The indirect ELISA (ID. VET. Innovative diagnostics, France) was performed by commercial kit. Optical densities (OD) were read at 450 nm. The results were expressed as the

The Statistical Analysis System (9) was used in study parameters. The Chi-square test was achieved to compare between percentages of the study

Results and Discussion

Latex agglutination test (LAT):

By using the LAT, prevalence of toxoplasmosis among camels was 25.2% (91 camels), 30.4% and 21.9% of infection was detected in females and males respectively (table 1).

This result runs parallel with the finding of (6) who detected aseroprevalance of 20.35% for toxoplasmosis at Al-Najaf province using the LAT, on the other hand in Al-Qadisiya province (5) reported 16.34% and in Egypt; (10) detect aprevalance of 17.4%.

While (7; 11) in Saudi Arabia reported seropositivity for

percentage of the mean absorbance values of sample (S) to the mean absorbance value of the positive (P) control sample provided with the diagnostic kit. The resultant S-P ratio was expressed as a percentage (S/P %). According to the manufacturers recommendation, sera with S/P% \leq 40% should be regarded as negative, between 40 and 50% as doubtful and \geq 50% as positive.

toxoplasmosis in camel with percent of 13.1% and 6.5% respectively. The highest seroprevelence for toxoplasmosis in camel using the LAT serologically was detected in the Butana plains, mid-eastern Sudan 67% (12), another high prevelence for *Toxoplasma gondii* seropositivity was detect in Sudan using the LAT (61.7%) (13).

However, the transmission and infection rates with toxoplasmosis in one host species depend on several factors such as the proximity to domestic and wild host density of cats, climatic and ecological conditions such as type of soil and test which used to evaluate rate of infection (14 ; 15; 16). Results of this test showed that, percent of infection in female animals (30.4%) were more than that in male animals (21.9%). There is significant differences ($P < 0.05$) between males and females infection percentage

Table (1): Seroprevalence of *Toxoplasma gondii* in camels by using Latex agglutination test(LAT)

Animal gender	Test No.	No. of positive cases	Percent of positiveness
Male	219	48	21.9
Female	141	43	30.4
Total	360	91	25.2
Chi-square value	--	--	3.943 *

* (P<0.05).

This finding agrees with (6)., While it disagrees with the findings of (12).

The agreement with (6) may be due to the same condition of animals included in the two studies such as the husbandry system, and management practices and **environmental factors**.

This study showed that there was positive correlation between the presence of *T.gondii* antibodies and age of camel (table 2), which agrees with (17) in Egypt and (13) in Sudan . It is conceivable that the longer an animal lives, the greater the chance of its being exposed to *Toxoplasma gondii*, acquisition of *Toxoplasma* infection by animals is thought to occur through ingestion or inhalation of sporulated oocysts that are shed by cats in the environment(12).

There is significant differences (P<0.05) between young and adult infection percentage.

Table(2): Seropositivity to *Toxoplasma gondii* using Latex agglutination test in camels at different ages

Age	No. of tested animal	No. of positive cases	Percent of positiveness
< 2years	226	54	23.8
> 2-5 years	73	18	24.6
> 5-8years	22	6	27.2
> 8-10 years	39	13	33.3
Chi-square value	--	--	4.033 *

* ($P < 0.05$).

Indirect Enzyme-Linked Immunosorbent Assay (iELISA):

iELISA was used to test or confirm the positive reactors for LAT which detects non specific antibodies for *T.gondii*(cross reacted with other microorganism), in addition to both IgM and IgG antibodies in infected animals, while iELISA is specific for detection of only IgG antibodies or IgM (18).

The results of iELISA revealed 15 (16.4 %) positive cases out of (91) LAT positive samples and 15(4.1%) out of the total 360 animal samples, which had no significant differences ($P > 0.05$) between the genders.

Table (3): Positive samples to *Toxoplasma gondii* using iELISA applied on LAT positive serum samples in male and female camels.

Animal gender	Test No.	No. of Positive cases	Percent of positiveness
Male	48	7	14.5
Female	43	8	18.6
Total	91	15	16.4
Chi-square value	--	--	0.866 NS

NS: Non-significant

Among 48 males positive to LAT, 7 (14.5 %) were positive to iELISA and out of 43 female, 8 (18.6 %) were positive.

Our result was not compatible with result reported by (19) who detected 17 (8%) samples positive to ELISA when examined 210 serum sample of camels in Al-Ahsaa area in Saudi Arabia.

The titers of antibodies were highly significant ($P < 0.01$) between young and adult infection percentage, we did not get studies about relation between age of animals and positivity to ELISA to compare with our result.

Table (4): Percentage of *toxoplasma* infection in different age groups using iELISA test.

Age	Tested No.	No. of positive cases	Percent of positiveness
< 2 years	54	8	14.8
> 2-5 years	18	2	11.11
> 5-8 years	6	2	33.3
> 8-10 years	13	3	23.0
Chi-square value	--	--	6.316 **

** (P<0.01).

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