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DETECTION OF TOXOPLASMOSIS IN CATS AND SHEEP

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Summary

Thirty-three fecal samples from cats were examined for the presence of *Toxoplasma* oocysts, and another 33 serum samples from these cats were subjected for Latex agglutination test & indirect immunofluorecent antibody test. Also 80 serum samples from ewes were subjected to the same serological tests. The study indicated that the prevalence of *Toxoplasma* oocysts in cats was 27.3%. Higher rates of antibody titer (68%) were observed in cats tested with latex test. Infection in young cats was higher than in adults. Sixty percentage of ewes were sero-positive with Latex test, but only 35% were sero-positive with IFAT, higher prevalence of antibody titers was observed in sheep from the three locations of Iraq. Ewes that had recurrent abortion showed higher prevalence in both tests than non aborted ewes.

الكشف عن داء المقوسات بين القطط والأغنام

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الخلاصة

تم فحص نماذج براز لـ 33 قطة لمعرفة مدى انتشار أكياس بيض طفيلي المقوسات *Toxoplasma*، وفحص 33 نموذج مصلي من نفس القطط باستخدام اختباري اللاتكس التلازني واختبار التألق المناعي غير المباشر، وكذلك فحص 80 نموذج مصلي من نعاج مجهضة وغير مجهضة وباستخدام نفس الاختبارين المصليين. أشارت الدراسة إلى أن نسبة انتشار أكياس البيض لداء المقوسات في القطط كانت 27.3% وأظهر اختبار اللاتكس التلازني أعلى نسبة للحالات الموجبة في القطط وكانت الإصابة في القطط الصغيرة أعلى منها في القطط الكبيرة. أما الأغنام فكانت نسبة الأمصال الموجبة في اختباري اللاتكس التلازني والتألق المناعي غير المباشر هي 60% و35% على التوالي. ولوحظ أن نسبة انتشار الأضداد كانت مرتفعة في الأغنام في المناطق الثلاثة من العراق. وأظهرت النعاج ذات الاجهاضات المتكررة نسبة عالية للانتشار في كلا الاختبارين المصليين.

INTRODUCTION

Toxoplasmosis is one of the most widespread zoonoses in the world. Cats are the main sources and become dangers, for human and animal infection[1]. Most infections in all species are mild or subclinical. Fatal infections occasionally occur[1,2]. Antibodies to *Toxoplasma* are routinely found in all domestic animal species[1]. In sheep infection may occur by coitus due to the presence of the parasite in the semen[3], which causes abortion and stillbirth and leads to high economic risks[4].

Several reports were conducted on the epidemiology of the disease in animal species in many parts of the world during the last years[5,6,7,8]. In Iraq few studies have been carried out on the sero-epidemiology of toxoplasmosis in sheep this include Latex, indirect hemagglutination test, IFAT and CFT[9,10,11]. Studies concerning the epidemiology of toxoplasmosis in cats were very few[12]. Attempts for the detection of oocysts in the fecal samples of cats have not been made.

The present study was conducted to detect the prevalence of toxoplasmosis in cats and sheep in some areas of Iraq.

MATERIALS AND METHODS

Thirty-three local house cats, of both sexes, were used. Of these cats 21 were adult and 12 were young. Eighty ewes were used. Of these 24 ewes had recurrent abortion and 56 ewes had no history of abortion. All cats and ewes were collected from the same place in 3 province of Iraq, these are (Baghdad, Al-Najaf and Thaikar). The study extended from the first October 2000 to the end of March 2001.

Thirty-three fecal samples were collected from cats and sent to the clinical pathology lab., college of Vet. Med. University of Baghdad for detection of oocysts according to Frenkel [13]. Another 33 serum samples were collected directly from the heart of these cats after they had been subjected to general anesthesia using ketamin (Katlar 50%, 10mg/kg B.W.). Eighty serum samples were collected from the jugular vein of the ewes, which were from Baghdad, Al-Najaf and Thaikar. The serum samples were isolated by centrifuge and sent to the diagnostic laboratory in Al-Yarmok Teaching Hospital in Baghdad. Two serological tests were conducted. These were indirect Immunoflurecent antibody technique and latex agglutination test.

Results

The results of fecal examination and serological survey of the cats tested were summarized in Table 1. Among 33 fecal samples of cats examined 9 cases were positive (27.3%). The highest prevalence of antibody titer (68%) was recorded in cats tested with Latex test, whereas only 36.4% of cats were positive with IFAT when the titer 1/72 was considered positive. The rate of infection among cats in relation to the age is shown in Fig.1 and Fig. 2.

The prevalence of *Toxoplasma* antibody in sheep were 60% in the Latex test, whereas less a lower percentage (35%) was recorded in sheep subjected to IFAT when the titer 1/72 was considered positive (Table 2). According to Q square test the results revealed no significant ($P<0.05$) differences between aborted and non-aborted ewes in both tests.

Among 24 ewes with recurrent abortion 18 (75%) were positive when examined with Latex test and 12 (50%) were positive with IFAT. On the other hand, among 56 non-aborted ewes 30 (53.6%) were positive with Latex and 16 (28%) were positive with IFAT when the above mentioned titer was considered positive.

Table 1: Number and percentage of infected cats in three areas of Iraq

Area	Fecal Exam.		IFAT		Latex	
Baghdad (15)	3	(20 %)	6	(40 %)	10	(66 %)
Al-Najaf (1 8)	2	(25 %)	3	(37 %)	---	
Thaikar (10)	4	(40 %)	3	(30 %)	7	(70 %)
Total (33)	9	(27.3%)	12	(36.4%)	17	(68 %)

Table 2: Number and percentage of sero-positive sheep in three areas of Iraq

Area	IFAT		Latex	
	No.	%	No.	%
Baghdad	8	40	12	60
Al-Najaf	6	30	10	50
Thaikar	14	35	26	65
Total 80	28	35	48	60

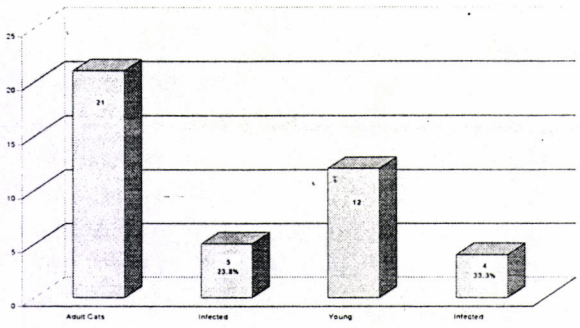

Fig. 1: Number and percentage of infected cats with *Toxoplasma* according to age

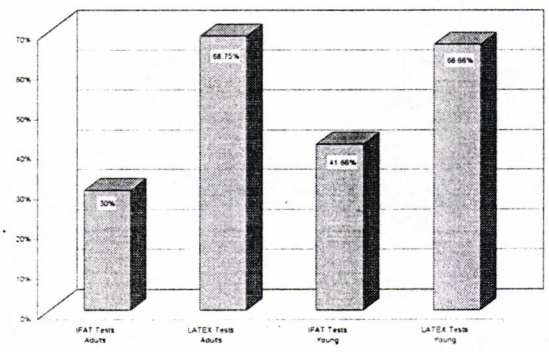

Fig. 2: Comparison between seropositive cats in both IFAT and LATEX tests

Discussion

Results of this study revealed the importance of cats as definitive hosts of toxoplasmosis with sheep acting as intermediate hosts. This view was also stated by Hoskins[14]. The prevalence of *Toxoplasma* oocysts in this study was 27%, while Dubey[2] stated that the prevalence of cats that shed oocysts did not exceed 1% from the cats examined in USA.

Of 33 serum samples of cats tested 17 (68%) were positive in the Latex test and 12 (36.4%) were positive with IFAT.

This result differs significantly from the study reported by Al-Abossy[12] who found that the prevalence of toxoplasmosis in stray cats was 81%. The difference in this result might be due to the reason that it was conducted on stray cats found near butchery and butcher markets. It was found that all the cats fed on infected meat shed oocysts with their faeces, while only 50% of them shed the oocysts when they took oocysts directly [2]. The number and percentage of oocysts that shed from young cats were higher than adult cats this could be attributed to

the mode of infection which include bradyzoites or oocysts, however cats only pass oocysts for a period of 12-20 days following initial infection[15].

The high infection rate of toxoplasmosis in sheep could be attributed to the presence of cats with sheep in addition to the contamination of pastures and feed store with infected faeces[6]. The high percentage of infection in aborted ewes is in agreement with O'Donoghune *et al.* [16] who attributed that to the wide distribution of the disease between aborted sheep.

This study proved that Latex test is more sensitive than IFAT in the diagnosis of *Toxoplasma* antibody. However, the accurate diagnosis depend on the detection of the present lgM, whereas Balfour *et al.*[17] stated that Latex test could be used instead of IFAT during sero-epidemiological studies in people.

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