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PREVALENCE OF *TOXOPLASMA GONDII* ANTIBODIES IN LIBYAN SHEEP (FAT-TAILED BARBARY)

(With 2 Tables)

By

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مدى إنتشار الاجسام المضادة للتوكسوبلازما قوندا في الأغنام الليبية (البربري)

خيرية مفتاح القماطى ، احمد محمد راشد ، عدنان سالم النعاس ، محمد محمد السيد

لقد شملت هده الدراسة على ٢٥٣ عينة من مصل الدم لفحص الأجسام المضادة لتعيين انتشار التوكسوبلازما قوندا في الأغنام الليبية (البربري) وذلك بواسطة إختبار الدم (latex agglutination test) وكانت نسبة الإصابة ١٠٣(٤٠,٧١%). وكانت كذلك نسبة إنتشار الأجسام المضادة للتوكسوبلازما قوندا عالية في الأغنام البالغة (≤ سنة واحدة) وأيضا كانت في الإناث أكثر من الذكور. تشير هذه النتائج بأن التوكسوبلازما قوندا في الأغنام كانت عالية واسعة الانتشار في منطقة طرابلس.

SUMMARY

This study was carried out in order to determine the prevalence of *Toxoplasma gondii* antibodies in Libyan sheep. A total of 253 sera taken from sheep were examined using a latex agglutination test. Out of 253 samples tested 103 (40.71%) were determined as seropositive. The prevalence of *Toxoplasma* antibodies was higher in adult sheep (≥1-year-old), and in female than male. These results indicate that ovine toxoplasmosis is widespread in Tripoli area.

Key words: *Toxoplasma gondii, antibodies, Libyan sheep.*

INTRODUCTION

Toxoplasma gondii is an obligatory intracellular protozoan parasite which appears to have broad host specificity. Cats and wild felines are the only definitive host while all other warm- blooded animals including human are intermediate hosts. Infection is acquired by ingestion of oocysts excreted by cats that contaminate food or water (Nissapatorn *et al.,* 2004). Cysts formed in sheep and other animals are also sources of infection for human beings too (Tenter *et al.,* 2000). Congenital transmission also occur when an uninfected mother acquires primary infection during pregnancy (Nissapatorn *et al.,* 2004).

In human the disease is widespread and it is usually asymptomatic, but in some cases it is characterized by adenopathy, fever and fatigue, however it can have serious consequences in fetuses, neonates and in immunocompromised individuals (Nissapatorn *et al.,* 2004).

Toxoplasma infection has a major economic impact on sheep resulting in prenatal deaths, abortion, fetal absorption and stillbirths (Masala *et al.,* 2003).

The seroprevalence of toxoplasmosis in sheep has been reported in several parts around the world. The prevalence rates have been varied among countries and diagnostic methods used (Tenter *et al.,* 2000) Latex agglutination test was used by several researchers for the detection of seroprevalence of *Toxoplasma* infection among sheep. (Sanad and Alohabban 2007, Oncel *et al*., 2005, Helmick *et al*., 2002, Hashemi-Fesharki, 1996, Zaki, 1995, Hoghooghi-Rad and Afraa; 1993 and Trees *et al*., 1989)

Although human toxoplasmosis in Libya has been reported in Tripoli by Khadre and Elnageh (1987) and in Benghazi by Kassem and Morsy (1991) there is little available literature about its prevalence among sheep.

The aim of the present work was to carry out preliminary study to determine the prevalence of *Toxoplasma gondii* among Fat-tailed Barbary sheep in Tripoly, Libya

MATERIALS and METHODS

Animals

The present study included a total number of 253 sheep (Fat-tailed Barbary), of both sexes, coming from different regions and

slaughtered in the abattoirs in city of Tripoli. The age of study group ranged from 6 months to 7years old.

Samples

Blood was collected in tubes without anticoagulant directly from the jugular vein at the time of slaughtering. The samples were allowed to clot (2 hours), centrifuged at 3000g for 5 minute and stored at -20°C till testing.

Serological testing

Serum samples were tested using latex agglutination test (toxocell latex Spain) according to the procedure listed by the manufactured company. Allowing the reagents to reach room temperature, 50ml of the serum (or one drop of control) were placed on one section of the slide. After shaking the reagent vial one drop of reagent was added next to the drop of sample. Both drops were mixed with a stirrer till cover the whole surface of the slide section, the slide was then rotated for 5 minutes manually or on a rotary shaker set at 80-100/rpm. Results were determined by the presence or absence of agglutination.

RESULTS

1- Out of 253 serum samples examined in this study a total of 103 (40.71%) were found to be seropositive. The association of age with the presence of infection revealed that seroprevalence was the highest in ≥1-year-old age group when compared with < 1year (Table 1)

Table1: *Toxolasma gondii* infection in relation to age.

Age groups	N0 of sheep examined	Seropositive		Seronegative	
		No	rate%	No	rate%
6mon-1year	151	49	32.5	102	67.5
≥1 year	102	54	52.9	48	47.1
Total	253	103	40.7	150	59.3

2 - A total of 63 (49.2%) out of 128 females and a total of 40 (32.0%) out of 125 males sheep tested were seropositive. Seroprevalence was the highest in females when compared with male as shown in Table 2.

Table 2: *Toxoplasma gondii* infection in relation to sex.

sex	No of examined Sheep	Seropositive		seronegative	
		No	rate%	No	rate%
Female	128	63	49.2	65	50.8
male	125	40	32.0	85	68.0
Total	253	103	40.7	150	59.3

DISCUSSION

Toxoplasmosis is a zoonotic disease caused by *Toxoplasma gondii* and has been known in many countries since 1908 (Dubey and Beattie, 1988). *Toxoplasma gondii* in sheep is distributed world wide, with prevalence rates ranging up to 100% in different countries (Dubey and Beattie, 1988; Tenter *et al.*, 2000).

The prevalence of 40,71% for *Toxoplasma gondii* antibodies found in this study is lower than those found in Ethiopia (56%), Turkey (65,08%) and Italy (77,8%), (Negash *et al.*, 2004, Oncel *et al.*, 2005, Fusco, *et al.*, 2007). On the other hand it is higher than those found in Bangladesh (17.65%), Brazil (18.75%), Iran (22.85%), Tripoli (13,5) and Morocco(27.6%), (Samad, *et al.*, 1993; Pita Gondim, *et al.*, 1999; Zia Ali *et al.*, 2007; Gusbi, 1986; Sawadogo *et al.*, 2005)

The difference observed could be due to the sampling techniques husbandry methods used in the different regions, frequency of cats on farms. Also the climatic variation has a role in *Toxoplasma* distribution as the prevalence of toxoplasmosis is higher in warm, moist as compared to cold, dry ones. This is attributed to the longer viability of *T. gondii* oocysts in moist or humid environments (Dubey, 1994).

The present study showed elevation in the prevalence of *Toxoplasma* infection in sheep in Tripoli area (40.71%) as compared with that done in the same area by the same technique by Gusbi (1986) (13,5%), which may results on increase the risk of human infection.

In the present work, LAT was used for the detection of *Toxoplasma*. The LAT is a sensitive, reliable and rapidly responsive serological test for the detection of *Toxoplasma* infection in sheep. The LAT showed rapid response with antibody first appearing by two to three weeks after infection (Trees *et al.*, 1989).

This result showed that age group is an important factor. Older sheep were found to have a higher infection rate than younger ones. This result is similar to that of Caballero-Ortega *et al.* (2008) who found that older animals were more frequently positive and with a stronger response than young ones. In addition Natale *et al.* (2007), Dumeter, *et al.* (2006) indicated that ovine toxoplasmosis seroprevalence was generally increasing according to age and was significantly lower in animals younger than one year. Similar results were obtaind in the present study where the highest prevalence was found in sheep more than one year old.

This study also showed that the prevalence of *Toxopasma gondii* antibodies in ewes was higher than rams, this is similar to those reported in Ghana and Saudi Arabia (Van der puije *et al.*, 2000, Sanad and ALghabban, 2007) and differs from that of Caballero-Ortega *et al.* (2008), who observed no differences between male and female sheep.

Finally, the results of this study confirm the presence of *Toxoplasma gondii* antibodies in Libyan sheep. *Toxoplasma* infection among animals is of great importance, because some of the infected animals play a distinct role as a source of human infection.

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