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RESEARCH ARTICLE

Serodiagnosis of ovine neosporosis in Mosul city, Iraq

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Özet

AL-Farwachi M, AL-Badrani B, AL-Khafaji W. Irak'ın Musul şehrinde koyun neosporozisin serodiagnozu. **Eurasian J Vet Sci, 2012, 28, 4, 190-193**

Amaç: Araştırmanın amacı Musul şehri koyunlarında *Neospora caninum*'un serodiagnozunun indirekt enzyme linked immunosorbent assay (iELISA) yöntemi ile belirlenmesidir.

Gereç ve Yöntem: Sekiz farklı koyun çiftliğinden elde edilen 288 serumda *Neospora caninum*'a karşı antikor varlığı iELISA yöntemi ile incelendi.

Bulgular: İncelene koyunların 35'inde (%12.2) antikor varlığı belirlendi. Hastalığın abort yapanlar, gebeler ve sağlıklı gebe olmayan koyunlarda prevalansı sırası ile %7.3, 10.4 ve 18.8 olarak belirlendi.

Öneri: Mevcut bulgu Musul şehrinde *Neospora caninum*'a karşı antikor varlığını bildiren ilk araştırmadır.

Abstract

AL-Farwachi M, AL-Badrani B, AL-Khafaji W. Serodiagnosis of ovine neosporosis in Mosul city, Iraq. **Eurasian J Vet Sci, 2012, 28, 4, 190-193**

Aim: The aim of this study was to determine the serodiagnosis of *Neospora caninum* by indirect enzyme linked immunosorbent assay (iELISA) among ewes in Mosul city.

Materials and Methods: Totally 288 sheep sera obtained from six farms were examined for antibodies against *Neospora caninum* by iELISA.

Results: Antibodies were found in 35 ewes (12.2%) with prevalence of 7.3, 10.4 and 18.8% in the aborted ewes, pregnant ewes, and in the healthy non pregnant animals, respectively.

Conclusion: This is the first evidence of *Neospora caninum* antibodies in sheep from Mosul city.

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Keywords: Neosporosis, ovine, serodiagnosis

► Introduction

Neospora caninum is a coccidian parasite (Dubey et al 2002), that was first recognized in dogs in 1984 (Bjerkas et al 1984) and was described as a new genus *Neospora,* type species *Neospora caninum* in 1988 (Dubey et al 1988). Cattle and other ungulates such as sheep, goats, horses, white-tailed deer, camels and water buffaloes may act as natural intermediate hosts (Dubey 2003, Chavez-Velsquez et al 2004, Rodrigues et al 2004). Canids such as dogs are the definitive host (McAllister et al 1988). Infection in sheep is transmitted either transplacentally or by ingestion of sporozoite-containing oocytes shed by definitive host (West et al 2006). This has resulted in repetitive abortion, mummified fetus or neonatal that physically healthy, but congenitally infected relative to the gestation stage of the adult sheep (Hassig et al 2003). Cerebral neosporosis was detected in adult Merino sheep (Bishop et al 2010).

Generally, the diagnosis of *Neospora caninum* associated abortion has relied on the histological examination of infected fetuses (Dubey et al 2006). Other methods used to study *Neospora caninum* include isolation of the parasite in cell culture (Lei et al 2005), an indirect fluorescent antibody test on various body fluids (Rahman et al 2011), immunohistochemistry (Boger and Hattel 2003) and a variety of ELISA (Jenkins et al 2005, Gaturaga et al 2005). The detection of specific anti-*neospora caninum* antibodies in sera of sheep has been useful for the diagnosis of disease and may also prove suitable for seroepidemiologic investigations (Abo-Shehada and Abu-Halaweh 2010, Munhoz et al 2010, Salaberry et al 2010). In Iraq little is known about the serodiagnosis of *Neospora caninum* in naturally exposed sheep.

The aim of this research was to investigate the existence of *Neospora caninum* specific antibody in the sera of sheep in Mosul.

► Materials and Methods

A 288 sera (96 sera from healthy non pregnant ewes, 96 sera from aborted animals and 96 sera from pregnant ewes, Mosul, Iraq) were collected from local breed ewes (3-6 years old) coming from six farms during April 2011 to April 2012. A commercial indirect ELISA kit (IDvet innovative Diagnostics, France) for detection of antibodies against *Neospora caninum* in serum was used. All sera were tested according to the manufacturer's instructions, then read the optical densities in the microwells using a micro plate reader at a wavelength of 450 nm. ELISA optical density (OD) reading was transformed to serum/positive percentage (S/P) according to a specific equation cited by manufacturer. The data management and statistical analysis by two-ways analysis of variance were performed using SPSS 10.1 software for windows.

► Results

The results of study showed that the total percentage of seropositive of *Neospora caninum* antibodies was 12.2 (Table 1). The percentage of seropositive values (S/P %) was significantly higher in the aborted animals than in other animals (Table 2).

Table 1. Percentages of seropositive of ovine neosporosis.

Origin of examined sera	Number of sera tested	Number of seropositive (%)
From pregnant ewes	96	10/96 (10.4)
From aborted ewes	96	7/96 (7.3)
From healthy non pregnant ewes	96	18/96 (18.8)
Total	288	35/288 (12.2)

Table 2. Distribution of the percentage of serum/positive values for N. caninum seropositive ewes.

Origin of examined sera	% of serum/positive
From pregnant ewes	43.8±2. 1
From aborted ewes	164.3±2.2*
From healthy non pregnant ewes	21.5±2.0

*Statistically significant $p<0.05$.

► Discussion

This is the first serodiagnosis of ovine neosporosis in the Mosul city, Iraq. In this study, an antibodies against *Neospora caninum* was detected in the 35 of 288 sera. Serological surveys indicate wide spread exposure to *Neospora caninum* in dairy and beef cattle and sheep in many parts of the world (Abo-Shehada and Abu-Halaweh 2010, Munhoz et al 2010, Salaberry et al 2010, Rahman et al 2011). Although there is no published information on the epidemiology of *Neospora caninum* in sheep in Mosul city, there are many serological studies of canine, bovine and ovine neosporosis in the local countries as Iran (Haddadzadeh et al 2007, Nourollahi Fard 2008, Salehi et al 2010), Turkey (Akca et al 2005, Kurtdede et al 2006, Simsek et al 2008) and Jordan (Al-Majali et al 2008, Abo-Shehada and Abu-Halaweh 2010).

This diagnosis of neosporosis in the live animal can be achieved by detection of anti-*Neospora caninum* antibodies using different serological tests, but ELISA is an approved serological test (Von Blumroder et al 2004). ELISA is the most suitable for high through put screening of antibodies to parasites, which has been used in epidemiological studies to estimate the prevalence of *Neospora caninum* infection and to examine the relationship between exposure to *Neospora caninum* and abortion, milk yield and culling in cattle (Hernandez et al 2002). Some researchers have recommended that the serological status of the herd be determined to obtain information about the risk of abortion and attributable to *Neospora caninum* infection.

In this study, the percentages of seropositive were 10.4, 7.3 and 18.8% in the pregnant animals, aborted ewes and healthy non pregnant ewes respectively. Review of a new published data indicates that *Neospora caninum* is a primary abortive agent in ewes (Hassig et al 2003, Howe et al 2008). Several studies demonstrate that chronically infected seropositive cows have an about two-to three fold increased risk of abortion compared to seronegative dams (Wouda et al 1998, Pfeiffer et al 2002). Thurmond and Hietala (1997) observed a 7.4-fold higher risk of abortion during the first gestation of congenitally infected heifers.

The percentage of seropositive values was significantly higher in the aborted animals than in other animals which reflect the high concentration of antibodies against neosporosis, as also in the previous serological studies showed the aborted dams from herd with endemic bovine abortion have higher antibodies against specific antigens (Schares et al 2000). Other researcher has also shown that the high antibody titers are found in post abortion sera and during the second part of pregnancy (Quintanilla-Gozalo et al 2000, Schares et al 2000).

► Conclusions

This the first report of serodiagnosis of bovine neosporosis in Mosul, Iraq. Results showed the presence of the disease; however, further epidemiological studies are needed to provide a better understanding of neosporosis under local conditions.

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