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Serological Study on *Chlamydophila abortus* in *Camelus dramedarius using* ELISA

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Abstract | Serological surveys for the detection of *Chlamydophila abortus* antibodies in *Camelus dramedies* were performed on 60 blood samples collected from both sex (38 female and 22 male) aged 5 to 12 years of age. The study were extended from June 2015 to September 2016. IDEXX Enzyme Linked Immunosorbent Assay was performed on all serum samples using an ELISA Kit (IDEXX Switzerland). All male camel's serum samples were negative for presence of *Chlamydophila abortus* antibodies, whereas 18 out 38 female samples were expressed positive in a percentage of 47.36%. In conclusion, this preliminary study approved presence of *Chlamydophila abortus* antibodies in she-camels. The authors recommend additional studies in different provinces of Iraq to investigate the general seroprevalence of this disease in the country.

Keywords | *Chlamydophila abortus*, Serology, IDEXX

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INTRODUCTION

Chlamydia is an obligate intercellular Gram negative coccobacilli bacteria (Radostits et al., 2007). *Chlamydia abortus* is one of the main reasons of abortion in livestock including camelids (Ali et al., 2012).The bacteria are non-spore-forming, but its elementary bodies act like spores when released into the host (Aljumaah and Hussein, 2012).Chlamydia is one of the important pathogens of animals, birds and humans (Elzlitne, and Elhafi, 2016). It constitutes nine species – *C. trachomatis*, *C.muridarum*, *C.suis*, *C.psittaci*, *C.pecorum*, *C. abortus*, *C.caveae*, *C.felis*and *C. pneumoniae*, eight of which can infect animals and cause disease (Samkange et al., 2010). Chlamydial species may cause several diseases such as enteritis, pneumonia, encephalitis, polyarthritis, abortion, mastitis, other urogenital tract infection and conjunctivitis (Swelum et al., 2014; Hussein et al., 2008). Chlamydiae infects male genital organs of ruminants, as well as it could cause prostatitis and epididymitis in men (Wagenlehner et al., 2006). Previous studies revealed scarce information concerning sero-prevalence of chlamydiosis in Iraqi camelids. Consequently, this study intended to investigate the sero-prevalence of natural infection of chlamydiosis in *Camelus dromedarius* in Iraq and its effect on some hematological and biochemical parameters.

MATERIAL AND METHODS

Samples Collection

A total of sixty (n=60) blood samples were collected from both sexes (38 female and 22 male) aged 5 to 12 years of age that slaughtered in the abattoirs during a period extended from June 2015 to September 2016. Twenty milliliters blood sample was collected from each animal and placed intotest tubes (with and without anticoagulant). Blood samples were transported in a cold box to a laboratory. Serum samples were collected after centrifugation of blood at test tubes without anticoagulant at 3000 rpm for 5 minutes. The sera were kept in Eppendorf tubes at -20°C until used for detection of *C. abortus* antibodies using an indirect enzyme-linked immunosorbent assay (ELISA)

and other serological examination. Plasma samples were isolated from blood samples with anticoagulant used for detection of alkaline phosphatase, creatinine kinas, glucose, chloride and zinc. Moreover, neutrophils percentage and other hematological investigation including Hb, MCV, MCHC were also done.

ELISA Test

IDEXX Enzyme Linked Immunosorbent assay using an ELISA kit (IDEXX Swizerland) were done for all serum samples according to the instruction of the manufacturing.

RESULTS

Total examined serum samples were 6o that constituted 22 and 38 for male and female respectively. All male samples (22 out of 22) of were negative in IDEXX ELISA. While, 18 out of 38 female serum samples in percentage of (47.36%) revealed positive results for *Chlamydophila abortus* antibodies in IDEXX ELISA. The total percentage of positive samples was 30% (18 out of 60) (Table 1).

Table 1: shows the positive and negative results of examined serum samples using IDEXX ELISA

	Samples No.	Positive	Percentage
Female	38	18	47. 36%
Male	22	Zero	-
Total	60	18	30%

The IDEXX ELISA positive she-camels were also revealed changes in the hematological and biochemical tests. The levels of total hemoglobin concentration, hematocrit, mean corpuscular volume (MCV), and neutrophils were (16% gm/dL), (37%), mean (39% U) and (74%) respectively. Moreover, levels of alkaline phosphatase, creatinine kinase and aspartate aminotransferase were (70% IU/I), (1.89.00% IU/I) and (69 IU/I) that revealed significant result statistically. A reduction in levels of glucose (40 mg/dL), chloride (105mmol/L), and zinc (40 ug/dL) were also observed in the affected camels (Table 2 and 3).

Table 2: Hematological parameters in ELISA Negative camels and ELISA she-positive camels for *chlamydia* (Mean ± SE)

Parameters	Normal	In ELISA she-positive camel
Total hemoglobin concentration (g/dL)	11.34 ± 0.95	16 ± 0.75
Packed cell volume (PCV hematocrit)	32.83 ± 3.76	37 ± 3.11
Mean corpuscular volume (MCV) %	17.80 ± 2.21	39 ± 2.22
Neutrophils %	43.60±1.30	74 ± 1.41

Table 3: Biochemical parameters in ELISA Negative camels and ELISA she-positive camels for *chlamydia* (Mean ± SE)

	In ELISA Negative camels	In ELISA she-positive camels
Zn	9±3.66	8±8.45
Alkaline phosphatase(IU/I)	196±27.5	197±78.6
Creatinine kinase (mg/dL)	0.95±0.18	1.24±0.10
Glucose (mg\dL)	74.6±9.11	60.42±9.66
Choloride (mg/dL)	2.36±0.53	1.95±0.90

DISCUSSION

Camel is one of the important Iraqi livestock that plays vital role in the social and economic life of Bedouins in several provinces. In Iraq, camel breeding still suffering from poor veterinary service and lack of facilities that help in raising camel accompanied with the changing of environment due to global warming and decreased of water resources (Al Salihi, 2016; Mudhar et al., 2016). One of the most important causes of infectious abortion in animals and human is chlamydiosis (Radostits et al., 2007). It is responsible on great economic loss due to abortion and death of fetus. *Chlamydophila abortus* is a causative agent, it is a Gram negative intracellular bacteria. Abortion is the important symptom that occur at late pregnancy in 20 -50% of infected sheep and accompanied with stillbirths, infertility, polyarthritis, pneumonia, enteritis, mastitis, encephalitis and conjunctivitis (Aitken, 2008; Aljummah and Hussein, 2012). According to OIE, (2012) placentitis, necrotic changes in cotyledons and decrease in milk production may also occur. an In this study, 30 % (18/60) camels were infected with *C. abortus* we agree with Elzlitne and Elhafi, (2016) reported an overall 12.25% prevalence of antibodies against chlamydiosis in the Libyan dromedary camel, which was lower than that of this study. Both female and male can infected with *C. abortus* and male get infection via coitus with infected female. The results of the current study detected the presence of anti-chlamydial antibodies only in serum of the female 47. 36% (18/38) with total percentage 30% (18/ 60), while all male serum were negative. This result is compatible with previous study in Egypt and Tunisia that revealed 11% and 7.6 % positive results of the examined camel's serum respectively (Hussein et al., 2008; Burgemeister et al., 1975). Moreover, the result of the current study is in agreement with Wernery and Wernery, (1990), who detected *C. abortus*antibodies in the serum of racing and breeding camels in the UAE, with respective prevalence rates of 15 and 24%, respectively. In Saudi Arabia, the sero-prevalence of chlamydiosis was 19.4% with a lower prevalence in male than female (Hussein et al., 2008).The examined male camel's serum

were negative in the present study that arein agreement with Hussein et al. (2008). However, Teankum et al. (2007) reported that male camels might be incriminated in transmitting the chlamydial infection. The results of the current study also revealed a significant increase in hemoglobin concentration, Mean corpuscular volume (MCV), Neutrophils percentages, Alkaline phosphatase Creatinine kinase, these results are in agreement with Elzlitne and Elhafi, (2016). These alterations occurred due to *C. abortus* infection and could be attributed to stimulation of bone marrow stem cells due to Chlamydial infection (Ismael et al., 2016). Moreover, there were significant decrease in Chloride, Zinc, Glucose levels, these results are compatible with Zaher et al. (2017). In conclusion, this study is the first preliminary study on seroprevalence of *C. abortus* in Iraqi camel (*Camelus dromedarius*). She- camels were positive in a percentage of 30 %, while all male were negative. Moreover, all seropositive animals were revealed changes in the hematological and biochemical parameters. The authors recommend more other seroprevalnace future studies on *Chlamidya abortus* in the camel (*Camelus dromedarius*) in Iraq, accompanied with molecular studies (PCR) to investigate the occurrence of chlamydophilosisin camelids.

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CONFLICT OF INTEREST

The authors have not declared any conflict of interests for the third party.

AUTHORS CONTRIBUTION

All authors contributed equally.

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