

Sero-prevalence of *Chlamydomphila abortus* in goat farms in Duhok Province-Iraq

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Abstract

Chlamydomphila abortus is still considered one of the most common causes of reproductive defeat in goats all over the world. In Duhok province, no data for the presence of *Chlamydomphila abortus* infection has been reported. This is a preliminary study on a sero-prevalence of *C. abortus* antibodies by using ELISA test from goat's flocks in Duhok province. Total of 92 female goats, that were ≥ 12 month old, were randomly selected from three flocks (Zakho, Amedy, and Summel districts) of 250 total animal populations in each flock in these three different districts in Duhok province from March to April 2013. From each individual animal, 5 ml of blood was collected from jugular vein and put them in a EDTA tubes for harvesting serum. Out of 92 dairy goats examined, 11.9% were seropositive for *C. abortus* antibodies. The highest percentage was reported to be in Summel district, then followed by Zakho district. The lowest rate was reported to be in Amedy district. The high percentage of sero-positive goats found in this study reflect that this pathogen is highly available in this areas and need further researches to identify the pathogen on a wide country level on many animal species with excellent quality control programs to eradicate this pathogen.

Key words: Sero-prevalence, *Chlamydomphila abortus*, ELISA, goat.

دراسة مصلية للكشف عن وجود اضرار (*Chlamydomphila abortus*) في قطعان الماعز في محافظة دهوك-العراق

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الخلاصة

تعتبر جرثومة الكلاميديا *Chlamydomphila abortus* احدى أهم مسببات الاجهاض في الماعز في العالم. ليست هناك دراسات او بيانات كافية عن نسب الاصابة بجرثومة الكلاميديا المسببة للاجهاض في المجترات في محافظة دهوك، تعد الدراسة الحالية الأولى في كشف وجود اضرار *Chlamydomphila abortus* بواسطة فحص الاليزا في قطعان الماعز في محافظة دهوك شمال العراق. اخذت الدراسة (92) عينة من اناث الماعز بعمر ≤ 12 شهرا و قد تم اختيارها عشوائيا من ثلاثة قطعان (في أقضية زاخو، العمادية ، وسميل) بمعدل (250) ماعز لكل قطيع. جمع (5) مل من الدم من الوريد الوداجي للحيوانات المفحوصة. و اظهرت الدراسة بان عدد 11 (11.9%) من مجموع 92 ماعز المشمولة بالدراسة نتائج موجبة لاختبار الاليزا. النسبة الاعلى سجلت في منطقة سميل وتلتها منطقة زاخو. في نفس الوقت كانت اقل نسبة سجلت في منطقة العمادية. هذه النسبة تعتبر عالية و تعكس مدى انتشار الاصابة بداء الكلاميديا المسببة للاجهاض في المجترات في هذه المنطقة لذا نوصي بدراسات اوسع حول انتشار المرض وطرق السيطرة للحد من انتشار المرض.

الكلمات المفتاحية: دراسة مصلية ، *Chlamydomphila abortus* ، الاليزا، الماعز.

Introduction

Chlamydomphalosis is a bacterial infection caused by *Chlamydomphila abortus* (formerly *Chlamydia psittaci* serotype 1) an established zoonotic pathogen that infects farm animals and has been noted as a major cause of abortions in sheep and goats (1,2). It was

reported that Chlamydomphal abortion in the United Kingdom accounts for about 50% of all diagnosed abortions (3). In the United States of America the main cause of abortion in does is a *C. abortus* (4). In addition to the economic importance in the does and ewes

industry, the *C. abortus* induces abortion in human as a result of contact with aborted doe or ewe (5, 6) The development of clinical signs of chlamydophilosis depends on the period of infection. Ewe and doe infected 5-6 weeks before giving birth can develop the clinical disease during their current gestation. Animals infected during the last four weeks of gestation a latent infection can develop; and in the next gestation clinical signs will appear. It has been shown that the reproductive organs of ewes and goats suffering from a latent infection can contain *C. abortus* even more than 3 years after the infection (7). Kids and lambs delivered by animals that are infected by *C. abortus* are generally weak and die a few days after birth (8). However, several studies have been conducted on seroprevalence of chlamydophilosis in different part of Iraq. Al-Dabagh *et al.*, (9) reported the prevalence of *C. abortus* in sheep was 11.2% in Nineveh. In another study by Cati *et al.*, (10) showed that 3.41% of aborted ewe had antibodies against *C. abortus* in southern Iraq. In view of the importance of *C. abortus* in goat's breeding and public health concern and of limited data on its seroprevalence in Duhok province, Iraq, this research was aimed to investigate the presence of anti *C. abortus* antibodies in goat herds in this area.

Materials and methods

1. Sampling

Blood samples were collected from March-April 2013 at three local breed goats' flocks without history of vaccination in Duhok province (Amedy, Summel and Zakho districts) with an average total animal population in each flock of about 250 goats, in which a total of 92 female goats (Amedy 31, Summel 31 and Zakho 30) that were ≥ 12 month old, were randomly selected with a history of abortion in all sampled does and examined for the presence of *C. abortus* antibodies. A 5 ml blood sample was

collected from jugular vein of each animal using gel tubes. Samples were allowed to clot and after centrifugation at 5000 RPM for 10 min sera were stored at -20°C until testing.

2. Serological analysis

The kit was group-specific indirect ELISA that is commercially available (ID VET innovative diagnosis-France). This kit was used to detect the presence of chlamydophilial antibodies. The test was used according to the manufactures instruction. Briefly, test serum samples were diluted at 1/10 in the wells of micro-titre plate that was pre-coated with *C. abortus* antigen in which a 90 μl of dilution buffer 2 was added to each micro-well, 10 μl of both negative control and positive control were added to wells A1, B1 and C1, D1 respectively, and 10 μl of serum samples were added to the remaining wells and then incubated for 30 min at room temperature in a humid chamber to allow the binding of any *C. abortus*-reactive antibody. After incubation, micro-titre plate was washed 3 times with wash solution and then 100 μl of the conjugate 1X (prepared by diluting the 10X conjugate to 1/10 in dilution buffer 3), was added to each well and incubated for 30 min at room temperature and washing step was repeated as above and then a 100 μl of the substrate solution was added to each well which was incubated as above in dark then after finishing a 100 μl of the stop solution was added to each well for stopping the reaction and finally the OD (optical density) was read and recorded immediately at 450 nm. The test was validated if the mean OD value of both positive and negative (ODPC and ODNC) is greater than 3, 5 and the S/P (sample to positive) ratio was calculated for each sample according to this formula ($\text{S/P} = \frac{\text{OD sample} - \text{ODNC}}{\text{ODPC} - \text{ODNC}} \times 100$), in which sera presenting a S/P less than or equal to 40% were considered negative while between 40-50% were considered doubtful and with 50% or greater were positive.

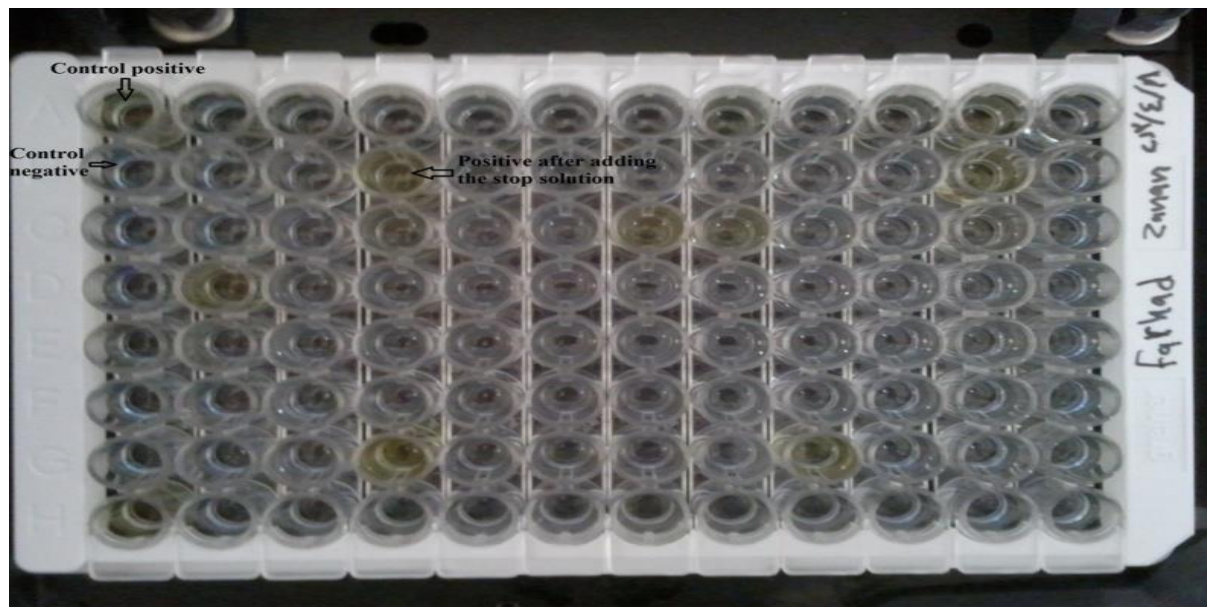
Results

Out of the 92 sera examined for the presence of antibodies against *C. abortus*, only 11 sera were positive (11.9%), (5 were from Summel (16.1%), 3 from Zakho (10%),

and 3 from Amedy districts (9.6%)) (Table 1). Those samples were considered positive according to the manufacturer's instruction in which a S/P ratio greater than 50% (Fig. 1).

Table (1): Show seropositivity of anti *C. abortus* antibodies in different localities by using ELISA test.

Districts	Sample No.	Positive sera	Negative sera	Positive percentage
Amedy	31	3	28	9.6
Summel	31	5	26	16.1
Zakho	30	3	27	10
Total	92	11	81	11.9

**Fig. (1): Shows the results of ELISA test after adding the stop solution.**

Discussion

Travniaek *et al.* (11) stated that indirect ELISA is more specific and sensitive tool than other serological tests. They concluded that indirect ELISA is suitable as a routine test for Chlamydia diagnosis and sero-epidemiological studies in many animal species, for this reason this tool was chosen in this study to identify *C. abortus* antibodies. The percentage of seropositive goats found in the present study was 11.9%, which was greater than (8%) in Namibia (13), (4.2%) in Poland (12), (7.7%) in the Slovak Republic (15), (1.1%) in Tobago (16) and nearly the same results reported in Jordan (11.4%) (8), and (9.3%) reported in Brazil (12), while these results have been lower than (24.2%) which were reported in Slovak Republic (17) and also lower than that reported in Taiwan (18) with a percents of about 16.7% of healthy and 58% of aborted does had *C. abortus* IgG positive sera. The prevalence variation between the different studies may be due to sampling methods, samples size, differences in study design and target populations or may be due to the previous

vaccination. The relatively high percent of this pathogen in this study may be due to the introduction of previously infected animals from the neighboring countries, because Duhok province has wide live relations with many adjacent countries in the terms of animal movements. The abortion was noticed in all goats. This status has been confirmed by several literatures that the *C. abortus* is the main common cause of does abortion (19, 20, 21, 22). The relative high percentage which was demonstrated in this study means that the agent is widespread in dairy goat's flocks in the region. The findings of this study provide some baseline information regarding the presence of *C. abortus* from individual goats that could be used in future studies. The seroprevalence of *C. abortus* in this areas is relatively high, therefore it is necessary for the authorities (Ministry of Agriculture) having the responsibility to set up correct epidemiological surveillance. Also many researches to identify *C. abortus* on a wide country level on many animal species should be done and to eradicate the pathogen

need a perfect control program.
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