*Plant Archives* Vol. 20, No. 1, 2020 pp. 1926-1929 **e-ISSN:2581-6063 (online), ISSN:0972-5210**

# SEROLOGICAL AND BIOCHEMICAL STUDY OF OVINE CHLAMYDIOSIS IN BAGHDAD CITY

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## Abstract

This study was conducted to detect the seroprevalence of ovine chlamydiosis in Baghdad province by using indirect ELISA and also study some biochemical changes associated with chlamydiosissis in sheep. (160) serum samples were collected randomly from sheep (14 rams and 146 ewes) in herds with a history of abortion and located in different areas of Baghdad in the period between October 2018 to February 2019. Serum sample were divided into two parts, the first part were examined by ELISA to detect chlamydiosis, and the second part were used to evaluate the biochemical parameters (ALT, AST, creatinine, CK, urea and total protein). The study showed that the seroprevalence of ovine was (%20) in aborted ewes and (25%) in non-aborted ewes. Prevalence was recorded as (%20.55) in ewes and (%28.57) in rams and also in the age group (1-<3 years) were recorded the highest prevalence %26.31 with a significant difference ($p<0.05$). A significant increase was recorded in ALT, AST, CK and creatinine and a significant decrease in Urea in infected animals. This study revealed a significant decrease ($p<0.05$) of total protein in serum of chlamydiosis infected sheep comparing to non-infected sheep. It was concluded that chlamydiosis is highly prevalent in Baghdad province and it has a serious harmful effects on biochemical parameters in sheep.

***Key words :*** Prevalence, Chlamydiosis, ELISA, Biochemical tests.

## Introduction

Abortion can be define as an expulsion of dead or live fetus from uterus before it reaches a viable age at any stages of gestation and it causes a considerable economic losses in live stocks and also may be of great importance to public health if it caused by microorganism that may cause disease to human. Causes of abortion can be infectious such as bacterial, viral, fungal, protozoan, and chlamydial agent which are the main infections causes of abortion in many countries around the world (Benkirane *et al.*, 2015). The family Chlamydiaceae consists of pathogens that cause disease in humans and many animals (Baud *et al.*, 2008). The clinical diagnosis of EAE is often difficult. Serological tests for *Cp. abortus* such as complement fixation test, immunofluorescence test, or enzyme- linked immunosorbent assay (ELISA) lack specificity because they are based on the use of preparations whose main components are major outer membrane protein (MOMP) and lipopolysaccharide (LPS) which are common to all Chlamydiacae family members and may cross-react with gram-negative bacteria (Masala *et al.*, 2007).

Intracellular organisms such as chlamydia has a serious effects on animals health because it infect vital organs such as liver, kidney, muscles and heart leading to their damage, impairment of their functions and change in some biochemical parameters (enzymes) such as AST and ALT that present in most body cells and tissues specially liver and muscle. Also, ASP that present in liver, bone, intestine, kidney and placenta and CK which located mainly in skeletal muscle, heart and brain were its liberation and concentration in blood increases due to tissue damage in case of chlamydiosis and these changes can be used as indicators for infection with Chlamydia and helps in the diagnosis (Boharoum *et al.*, 2012). this study was designed to study Serological detection of ovine Chlamydiosis in some area of Baghdad city and Investigation of the effect of chlamydiosis on some serum biochemical parameters in sheep

## Materials and Methods

One hundred and sixty local breed sheep from all

ages and both sex (14 rams and 146 ewes) was selected randomly from different herds suffering from abortion in many area of Baghdad during the period from October 2018 to February 2019 for investigating the prevalence of Chlamydiosis and Ten ml of blood sample were collected from jugular vein of each animal using disposable syringe after sterilizing the puncture area with 70% alcohol. Each sample was put into sterile test tubes to obtain serum from blood and serum transferred into small tubes (Eppendorf) and kept in -20Co until use. Serum was used for ELISA- IgG which was done according to the instructions of the manufacture (*Chlamydophila abortus*) Indirect kit product by Innovative Diagnostics (ID. vet) France, while biochemical tests were done by refretrone commercial kits.

## Results and Discussion

Out of a total 160 sera samples from sheep tested by indirect ELISA a total of 34 (21.25%) gave positive results. Out of 120 aborted ewes, 24 (20%) gave positive results; While 10 (25%) out of 40 none aborted gave positive results as showed in table 1. These results agreed with other studies such as (Esmaeilli *et al.*, 2015; Yuan *et al.*, 2014; Huang *et al.*, 2013; Chahota *et al.*, 2015).with a percentage of 25.6%, 18.65%, 20.9 %, 19.33% respectively. And our present study disagreed with (Krkalicet *et al.*, 2016; Majid *et al.*, 2018; Fahad *et al.*, 2017; Aldabagh *et al.*, 2013) with a percentage of 43.3%, 4.34%, 11.41% and 11.2% respectively. The variations in the results between our study and other studies may be due to many factors such as the geographical location of the study; type of the serological test used and its efficacy; size and type of sample taken; Breed of animal; grazing strategies ; population density; bad management; nutritional deficiency; uncontrolled restriction of diseased animal movement from infected area; faulty disposal of infected animals and aborted fetus and placental membrane; ignorance of zoonotic importance of *chlamydiosis* and its economic losses and the type of the study performed on aborted or healthy animals. (Merdja *et al.*, 2015; Roukbi *et al.*, 2016) pointed that differences between the epidemiological studies may be due to flock size, applied techniques (CFT, ELISA), the climatic conditions and breeding practices, animal trading in borders, the sanitarium situation of the breeding herds.

**Table 1:** Seroprevalance of ovine chlamydiosis in Baghdad.

| Percentage | Positive | Total No. | Status | Animal spp. |
|---|---|---|---|---|
| 40% | 12* | 120 | Aborted | Sheep |
| 25% | 10 | 40 | Non aborted | |
| 21.25% | 34 | 160 | Total | |

* Significant differences at ($p<0.05$).

**Table 2:** Seroprevalence of ovine chlamydiosis according to gender.

| Percentage | Positive | Total No. | Gender |
|---|---|---|---|
| 28.57% | *4 | 14 | Rams |
| 20.55% | 30 | 146 | Ewes |
| 21.25% | 34 | 160 | Total |

* Significant differences at ($p<0.05$).

**Table 3:** Seroprevalance of ovine chlamydiosis according to age group.

| Percentage | Positive | Total No. | Age group |
|---|---|---|---|
| 26.31% | *10 | 38 | 1 - <3 |
| 19.67 | 24 | 122 | 3 – 6 |
| 21.25% | 34 | 160 | Total |

* Significant differences at ($p<0.05$).

Out of 14 rams only 4 (28.57%) showed positive results. While for ewes, Out of 146 ewes 30 (20.55%) gave positive results with a significant differences according to gender ($p<0.05$) as showed in table 2. The higher prevalence in our study among males than females was in agreement with (Qin *et al.*, 2014; Roukbi *et al.*, 2016). On the other hand, our study result disagreed with (Esmaeili *et al.*, 2015; Huang *et al.*, 2013; Zenebe *et al.*, 2015). This variation between the two genders in this study may be due to the small number of rams tested comparing to ewes which disagreed with many studies. The presence of infected rams without any clinical signs and inflammation in the accessory glands, testes, and occasionally the epididymides is very important source of spreading infection to ewes and other fields during mating and semen may serve as the vector for Chlamydiae. (Boukary *et al.*, 2013; Roukbi *et al.*, 2016).

Out of 38 animal were between 1 - <3 years only 10 (26.31%) showed positive results. While for animal between 3 - 6 years out of 61 animal only 24 (19.67%) gave positive results with a significant differences according to age group ($p<0.05$) as indicated in table 3. Our study

**Table 4:** Serum protein and biochemical values in chlamydia infected & non-infected sheep; range and mean± SE.

| Non-Infected sheep\ (n=35) | Infected sheep (n=34) | Parameter |
|---|---|---|
| 7.45-24.717.53±1.29b | 7.82-26.518.08±1.61A | ALT (IU\L) |
| 20.7-15096.46±8.95b | 29.3-207107.55±49.91A | AST (IU\L) |
| 44.9-556209.98±89.95b | 109-556286.08±47.39A | CK (IU\L) |
| 53.3-84.365.4±6.84a | 20-90.352.15±7.17B | Urea (mg\dl) |
| 0.5-0.880.661±0.129b | 0.5-0.980.62±0.129A | Creatininemg\dl)) |
| 43-8264.07±3.29a | 42-7159.49±1.83B | Total proteing\dl |

agreed with (Zhao *et al.*, 2012; Qin *et al.*, 2014; Esmaeili, *et al.*, 2015) who considered season and age as a major risk factors associated with *Cp. abortus* infection and animals that have aborted due to *Cp. abortus*, develop protective immunity for about 3 years; therefore, in this situation next abortion will happen in the third or fourth pregnancy. While our study disagreed with (Cubero-Pablo *et al.*, 2000; Salinas *et al.*, 2008; McCauley *et al.*, 2010) noticed that no effect of age and sex will be observed.

All 34 serum samples that were positive to ELISA considered infected and 35 negative samples were selected for comparison with infected animals in and biochemical parameters. The results of biochemical parameters revealed range and mean± slandered error in infected sheep as shown in table 4 as follows: ALT7.82-26.5 18.08+1.61; AST29.3-207 107.55±49.91; CK 109-556 286.08 ± 47.39; Urea 20-90.3 52.15±7.17; Creatinine 0.5-0.98 0.62±0.129 and Total protein 42-7159.49±1.83; while in non-infected sheep the results were: ALT7.45-24.717.53±1.29AST20.7-15096.46±8.95; CK 44.9-556209.98±89.95 Urea53.3-84.3 65.4±6.84; Creatinine 0.5-0.88 0.661±0.129 and Total protein 43-8264.07±3.29. There is a significant difference in this study between infected and non-infected sheep. There is a significant increase in ALT, AST, creatinine and CK and a significant decrease in total protein and urea in infected sheep comparing to non-infected sheep. The results of this study were in agreement (Ismael *et al.*, 2014; Ismael *et al.*, 2016; Zaher *et al.*, 2017). Who recorded significant changes in some biochemical parameters accompanied with chlamydiosis in sheep and other farm animals. Chlamydiosis infect the body leading to damage and impairment of functions of vital organs such as muscle; heart, kidney and liver decrease or increase in the liberation of their enzymes according to stage of the disease (Bouhroum *et al.*, 2012; Zaher *et al.*, 2017).

Our results are in disagreement with (Ustun *et al.*, 2004) who didn't notice any changes in biochemical parameters in animals infected with intracellular pathogens. Also it disagreed with (Kushrahn *et al.*, 2014) who found a significant decrease in ALT, AST and SD in intracellular pathogens infected animals which may be due to the fact that the difference in the activity of liver enzymes related to severity of the disease. Our results showed that total protein, albumin and globulin significantly decreased in infected sheep ($p<0.05$) compared to non-infected sheep. These results are in agreement with (Al-Hussery & Al-Zuhery, 2010; Arslan *et al.*, (011) who pointed that hypoproteinemia occur due to damage in the reticuloendothelium of the liver due to intracellular infections which leading to decrease in hepatic protein synthesis. (Montoye & Liesenfeld, 2004) mentioned that damage of kidney due to intracellular infections lead to increase in the execration of protein in urine.

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