PREVALENCE OF Q- FEVER IN SMALL RUMINANTS IN AL-QASSIM CITY

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ABSTRACT
The present study was carried out on 500 small ruminants (sheep and goats) to determine the prevalence of Coxielosis in small ruminants in AL-Qassim city by using ELISA test.

The results showed 16% of small ruminants in AL-Qassim city were seropositive to coxiellosis. Infection in sheep (19.4%) was higher than in goat (8%). The present study was concluded that coxiellosis did not affect by sex and age of examined animals.

INTRODUCTION
Q fever is a zoonotic disease first identified in Queensland, Australia, in 1935. The disease was named “Query (Q)” fever, because its etiopathogenesis was not known (1). Since its discovery, Q fever has been reported worldwide with the exception of New Zealand (2).
The aetiological agent, Coxiella burnetii, is a Gram-negative obligate intracellular bacterium, was belonged to the Rickettsiaceae family (3). Sheep, cattle, and goats are considered the most common livestock reservoirs for the disease. Infection has been noted in a wide variety of other animals, including other species of livestock and in domesticated pets (4), and small ruminants are considered as the source of human Q-fever in Netherland (5).
The main clinical manifestations of Q fever in goats and sheep are abortion and stillbirth, also most of animals have subclinical disease. Organisms are excreted in milk, urine, and feces of infected animals. Most importantly, the organisms are shed in high numbers within amniotic fluids and the placenta (6, 7).
Serological surveys have been carried out in many countries to evaluate the distribution of Q fever in domesticated ruminants (8, 9, 10, 11, 12).
Among serologic tests for detection of antibodies against C. burnetii, ELISA and immunofluorescence assay (IFA) are commercially available. ELISA is best than IFA for serologic study because it has higher sensitivity (12).
The importance of this disease is related much more with human health and must be considered by veterinary services as both economic and public health importance.
MATERIALS AND METHODS

Samples:
Blood samples were collected by jugular venipuncture randomly from 350 sheep and 150 goats of different sexes and classified in two groups of age as yearling (1-2 years old) and adult (>2 years old) from different rural locations in AL-Qassim city during June and July 2011.

Sera were separated by centrifugation 11000 r.p.m for 5 minutes at 4 C (by cooled centrifuge), and serum samples were preserved at freezing until used.

ELISA. Serum samples were tested for Q fever antibodies using the indirect ELISA kit (Idexx Switzerland, Switzerland), according to the protocol recommended by the manufacturer. Sera were prepared at 1:400 dilution, and specific antibodies were detected using a peroxidase-labeled anti-ruminant immunoglobulin G (IgG) conjugate. Results were expressed as a percentage of the optical density reading of the test sample (value), calculated as value = 100 × (S − N)/ (P − N), where S, N, and P are the OD of the test sample, the negative control, and the positive control, respectively. Sera were considered to be ELISA positive if they had a value of 40% or more, suspect if the value was between 30% and 40%, and negative if the value was < 30%.

Statistical analysis
The prevalence rate was estimated and t-student test for detection the Differences were significant or not.

RESULTS
Out of 500 serum samples, only 80 samples of small ruminants were positive for ELISA anti-Coxiella burnetii as 16%, sheep and goat had seropositive of Coxielosis as 19.4%, 8% respectively, table (1)

Table (1): prevalence rate of Q-fever in small ruminants

<table>
<thead>
<tr>
<th>Animals</th>
<th>Examined animals</th>
<th>Positive ELISA</th>
<th>Infection %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheep</td>
<td>350</td>
<td>68</td>
<td>19.4</td>
</tr>
<tr>
<td>Goat</td>
<td>150</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>500</td>
<td>80</td>
<td>16</td>
</tr>
</tbody>
</table>

The results were showed the significant effect of age on coxielosis in small ruminants as 19.3%, 19.5% as Q-fever prevalence in (1-2 years), (> 2 years) aged of sheep respectively, and 8.3%, 7.7% as Q-fever prevalence in (1-2 years), (> 2 years) aged of goat respectively, table (2)
Table (2): Effect of age of examined small ruminants on Q-fever prevalence

<table>
<thead>
<tr>
<th>Aged groups</th>
<th>1-2 years old</th>
<th>&gt; 2 years old</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Examined animals</td>
<td>Positive ELISA</td>
</tr>
<tr>
<td>Sheep</td>
<td>150</td>
<td>29</td>
</tr>
<tr>
<td>Goat</td>
<td>60</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>210</td>
<td>34</td>
</tr>
</tbody>
</table>

Table (3) was showed non-significant effect of sex of examined animals on Q-fever prevalence as 15% (male), 16.3% (female) in small ruminants, which summarized as (18.7% , 19.6% of male and female sheep respectively) and (7.5% , 8.1% of male and female goat respectively).

Table (3): Relationship between Sex and Q-fever prevalence of examined small ruminants

<table>
<thead>
<tr>
<th>Sex of animals</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Examined animals</td>
<td>Positive ELISA</td>
</tr>
<tr>
<td>Sheep</td>
<td>80</td>
<td>15</td>
</tr>
<tr>
<td>Goat</td>
<td>40</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>18</td>
</tr>
</tbody>
</table>

DISCUSSION

The results of present study were recorded seropositive of Q-fever in small ruminants (sheep and goat) in AL-Qassim city / Babil province as first time and that confirm the worldwide distribution (13).

The occurrence of disease due to many factors were assistant in disease prevalence as ticks (14), animal reservoirs of Q-fever as domesticated pets (15) or rodents (16), uncontrolled movements of small ruminants in grazing or in trades, disease occurrence in neighboring countries like Turkey and Iran (17, 18).

High prevalence rate of Q-fever in sheep (19.4%) than in goat (8%) is in according to (19), while (20) showed the disease prevalence in goat is higher than in sheep.

The prevalence rate of coxiellosis in sheep and goat in the present study is agreement with many reports in sheep as 20% in Spain (8), 18.9% in Cyprus (9), whereas in goat as 9.8% in Albania (10) but there are many studies revealed seropositivity to C.burnetii in both animals either lower or higher than our results as 3.5% in the Netherlands (12), 2 to 30% in Italy (21) and 10% in Mexico [11], and 62% in Sudan (22) but 3% in Northen of
Spain (23), 13.3% in Albania (24), 38% in Italy (6) (in sheep) and 6.3% in Italy (25), 48.2% in Cyprus (9), 17.7% in Albania (24), 15.6% in Newfoundland (26), 38% in Italy (6), 10.5% in Iran (18), 48.2% in Cyprus (9) in goat, these differences in the prevalence rates of *C. burnetii* infection in animals between present study and another studies in variant areas of world are attributed to varies types of testing, season, geographic location, assay type, as well as possible differences among laboratories and testing procedures and criteria used to define positive results (27).

There was non significant effect of age and sex on seroprevalence of disease in present study which in similar to results of (28) which revealed that coxiellosis was not affected by sex or age of small ruminant, but our result does not in accord to (29) who showed high occurrence of disease in females than males due to the organism has a high affinity for the placenta, fetal membranes and mammary glands, and is found in large numbers in these tissues.

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References


