# Epidemiological study of some factors affecting prevalence of clinical theileriosis in cows in southern Baghdad

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**Abstract :**

This study was carried out during one year in some districts located southern Baghdad to investigate some factors affecting prevalence of clinical theileriosis. The results showed high prevalence of clinical theileriosis 46.77% , the highest prevalence was in Yosefeira at a rate of 51.5% followed by Aldaera , Radwanyia , Al-Qaria alassryia and Mowelha at a rate of 48.25% ,46.84 % ,45.78% and 39.31% respectively. According to animal-associated factors ,the highest prevalence rate was noticed in animals aged less than 6 months 69.31% vs.22.27% in animals aged above 6 months , while it was 51.08% and 42.89% in males and females respectively. The highest prevalence was recorded in high grade cross breed 86.58% compared with cross breed 44.87% and local breed 25.89%.According to season, The results showed significant variation in prevalence of clinical theileriosis during the different seasons of study, the highest prevalence was in summer 53.48% , followed by spring and autumn at a rate of 43.14% and 37.4% respectively, while no clinical cases were recorded in winter.

Out of 682 examined animals, the tick infestation was observed in 381 animals in infestation rate 55.86%, the highest infestation rate was recorded in summer 58.3% followed by Spring ,Autumn and Winter in infestation rate 39.21% ,21.12% and 4.68% respectively. The ticks burden of individual animals was ranged 8-98 ticks (average 26 tick/ animals).The laboratory identification of ticks demonstrated three genera ,include *Hyaloma spp*., *Boophilus spp*.and *Rhipicephalus spp*.in percentage rate 62.5% , 42.3% and 21.2% respectively. The information obtained by questionnaire reveal the role of bad management and misusage of acaricides in control of vector ticks.

**الخلاصة :**

اجريت الدراسة في بعض مناطق جنوب بغداد و لمدة سنة واحدة للتحري عن بعض العوامل المؤثرة على حدوث داء الثايليريا السريري. أظهرت النتائج نسبة حدوث عالية للمرض بلغت 46.77 % وكانت النسبة الأعلى في منطقة اليوسفية 51.5% تلتها مناطق الدائرة،الرضوانية ،القرية العصرية ومويلحة بنسب حدوث 48.25% ،46.84% ،45.78 % و39.31% على التوالي.اعتمادا على العوامل المتعلقة بالحيوان،لوحظ إن أعلى نسبة حدوث في الحيوانات التي تتراوح أعمارها دون الستة أشهر 69.31% مقابل 22.27% في الحيوانات التي تفوق أعمارها الستة أشهر،بينما كانت نسب حدوث المرض 51.08% و 42.89% في الذكور والإناث على التوالي.كما سجلت أعلى نسبة إصابة في الأبقار الهجينة العالية النقاوة 86.58% مقارنة مع المضربة 44.87% والمحلية 25.89%.اما بالنسبة للموسم ،فكانت أعلى نسبة حدوث للمرض في فصل الصيف 53.48% يليه فصلي الربيع والخريف بنسبة 43.14% و 37.9% على التوالي ولم تسجل أي إصابة سريرية في فصل الشتاء.

من مجموع 682 حيوان تم تشخيص الخمج بالقراد في 381 منها بنسبة 55.86% وكانت أعلى نسبة خمج في الصيف 58.3 %يليه كل من فصل الربيع ،الخريف والشتاء بنسبة 39.21 % ،21.12% و 4.68% على التوالي وكان معدل عدد القراد 26 /حيوان.أوضح التشخيص ألمختبري وجود ثلاثة أجناس من القراد هي *Hyaloma spp*. و *Boophilus spp*. و *Rhipicephalus spp* بنسبة 62.5% ،42.3% و21.2% على التوالي، كما أظهرت المعلومات المستحصلة من الاستبيان دور الإدارة السيئة وسوء استخدام المبيدات الحشرية المستخدمة في السيطرة على القراد الناقل في زيادة حدوث الاصابة .

## Introduction

The endemic diseases ,particularly tick –borne diseases (TBDs) are the main factors that facing animal resource in tropical and subtropical countries ,including Iraq and cause vast financial losses due to reduction of animal productivity (1).Theileriosis is the most important member of TBDs in Iraq(2)which transmitted by tick vector of genus *Hyalomma* (3).Theileriosis is considered the important blood parasites of cattle , the effect of blood parasites and their vectors on cattle productivity differ according to several factors such as the causative agent, season ,breed ,prevalence of their vector and management regime,( 4;5 ) The importance of theileriosis is due to



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severe economic losses and their effect on the immunity of the animals (6) . In Iraq there is little studies available to investigate the impact of each of these factors on prevalence of clinical theileriosis ,thus the present study was designed to investigate the role of some factors that affect prevalence of clinical theileriosis in southern Baghdad districts , including:

- Factors associated with animals.
- Vector associated factors
- Factors associated with environment.
- Factors associated with owner and husbandry.

**Materials and methods**

**Study area:**

The study was carried out during one year ( April 2009- April 2010) in some districts located southern Baghdad , including Yosefeia , Mowelha , Al-daera , Al-Qaria alassryia and Radwayeia.

**Animals**: During periodic visits (4 visits / month ) to veterinary hospitals and private veterinary Clinics. A total of six hundreds and twenty cows including high grade cross breed , cross- breed and local breed were examined clinically and the data of each animal recorded in special clinical cards.

**Clinical diagnosis of disease:**The clinical diagnosis was depend on clinical signs that mentioned by (7), including fever, enlargement of lymph node , respiratory affection and ocular lesions . the tentative diagnosis was confirmed by microscopic examination of thick and thin ear vein blood film and lymph node aspiration as described by ( 8 ) .

**Ticks :** At clinical examination, the whole body tick burden was counted. Adult ticks , nymphal and larval ticks were collected by forceps and placed in screw top plastic containers , then identified in laboratory by species and sex according to ( 9)

**Questionnaire**: The questionnaire was conducted on 172 herd men to collect information about the importance of disease, type and method of application of used acaricide ,animal husbandry and method of grazing.

**Results**

Out of 682 animals, the clinical theileriosis was diagnosed in 319 animals in prevalence rate 46.77%, the laboratory examination of samples demonstrated the parasite in 196 and 232 blood and lymph film respectively. The highest prevalence was in Yosefeia in percentage of 51.5% followed by Aldaera , Radwanyia , Al-Qaria alassryia and Mowelha in percentage rate 48.25% ,46.84 % ,45.78% and 39.31% respectively,table1.

**Table 1: reveal the prevalence rates of clinical theileriosis in study areas**

| District | Examined No. | Positive cases No.(%) | | |
|---|---|---|---|---|
| | | clinical | Blood film | Lymph film |
| Al-daera | 143 | 69 ( 48.25 ) | 48 (33.56 ) | 51 (35.66 ) |
| Yosefeia | 200 | 103 (51.5) | 50 (25) | 65 (32.5) |
| Mowelha | 145 | 57 ( 39.31) | 37 (25.51) | 48 (33.1) |
| Radwanyeia | 111 | 52 (46.84) | 34 (30.63) | 37 (33.33) |
| Al-Qaria alassryia | 83 | 38 (45.78) | 27 (32.53) | 31 (37.34) |
| Total | 682 | 319 (46.77) | 196 (28.73) | 232 (34.01) |

**Animal risk factors:**

Table 2, reveals obvious variation in prevalence of clinical theileriosis according to different animal-associated factors .The prevalence rate was 69.31% and 22.27% in animals aged less than



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6 months and above 6 months respectively, while ,according to animal's gender ,the prevalence rate was 51.08% and 42.89% in males and females respectively. The highest prevalence was recorded in high grade cross breed (86.58%) compared with cross (44.87%) and local breed (25.89%),figure 1 reveal the clinical theileriosis in young calf.

**Table 2 : prevalence of clinical theileriosis according to animal-associated factors**

| factor | | examined | positive | % |
|---|---|---|---|---|
| age | Less 6 | 352 | 244 | 69.31 |
| | Above 6 | 330 | 75 | 22.27 |
| sex | Male | 323 | 165 | 51.08 |
| | female | 359 | 154 | 42.89 |
| breed | high grade cross breed | 82 | 71 | 86.58 |
| | Cross | 488 | 219 | 44.87 |
| | local | 112 | 29 | 25.89 |

**Figure 1 : enlargement of lymph node in 1.5 months old calf**

**Vectors of the disease:**

Out of 682 examined animals, the tick infestation was observed in 381 ,in infestation rate 55.86%. The highest infestation rate was recorded in summer(58.3%) followed by spring ,autumn and winter in infestation rate 39.21% ,21.12% and 4.68% respectively. The ticks burden of individual animals was ranged 8-98 ticks (average 26 tick/ animals).The laboratory identification of ticks demonstrated three genera ,include *Hyaloma spp*. , *Boophilus spp*.and *Rhipicephalus spp*.in percentage rate 62.5% ,42.3% and 21.2% respectively. Figure 2, demonstrate the relationship between the prevalence of acariasis and clinical theileriosis.



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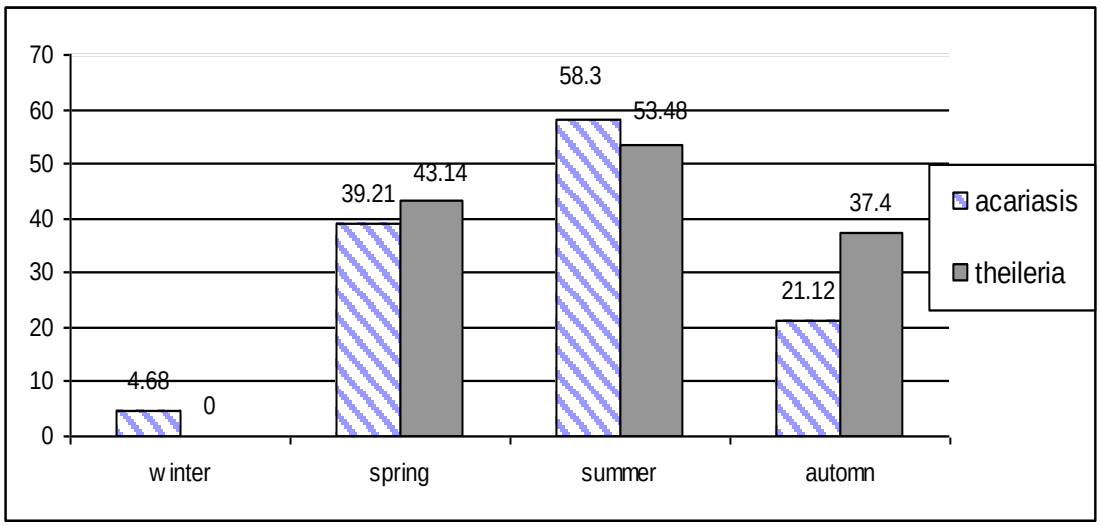


**Figure 2: reveal the relationship between prevalence of acariasis and clinical theileriosis**

**Environmental factors:**

The results showed significant variation in prevalence of clinical theileriosis during the different seasons of study, the highest prevalence was in summer 53.48% , by spring and autumn in percentage rate 43.14% and 37.4% respectively, while no clinical cases were recorded at winter. According to months, the highest prevalence was at July 55.2% followed by August ,June ,May ,April ,September ,October, November and March in percentage rate 53.57% ,51.69% ,49.6% ,46.51%, 41.52% 36.21% ,34.48% and 33.33% respectively .Figure 3 reveal the relationship between the environmental temperature and prevalence of clinical theilleriosis .

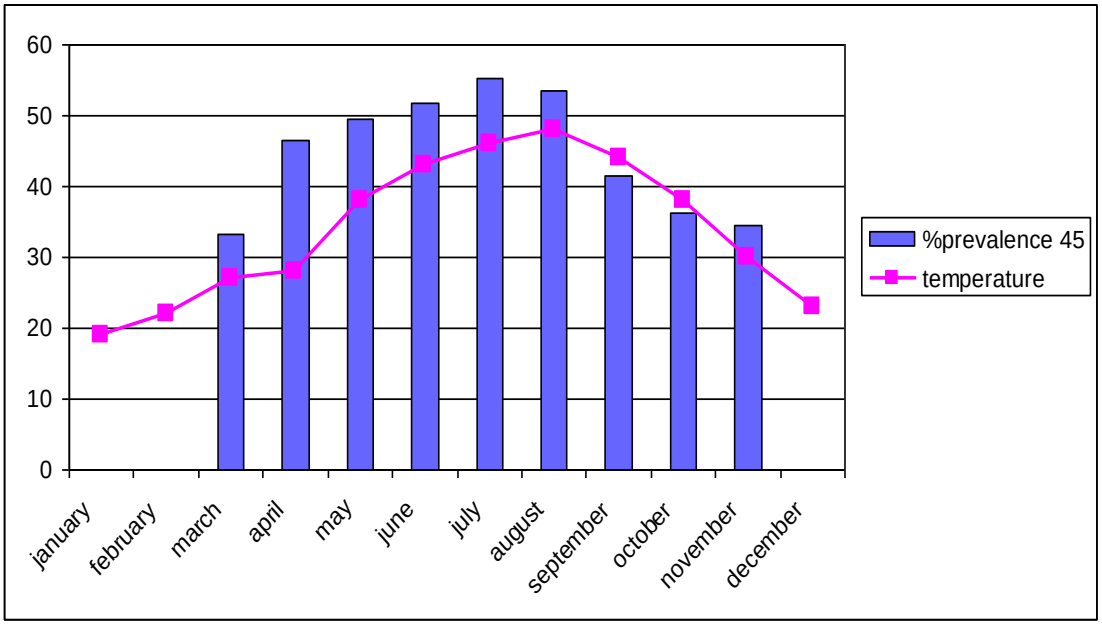


**Figure 3: reveal the relationship between the environmental temperature and prevalence of clinical theilleriosis**

**Factors associated with owner and husbandry:**

The data were obtained from 172 questionnaire papers were summarized in table 3.



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**Table 3:reveal the information obtained from questionnaire**

| | | | | | |
|---|---|---|---|---|---|
| **Q1** | **Are you note increase in prevalence of theileriosis in last years ?** | | | | |
| **A1** | **Yes** | **Some what** | **No** | **I don't note** | |
| | **56.98%** | **26.16%** | **12.8%** | **4.06%** | |
| **Q2** | **Are you note increase in prevalence of acariasis ?** | | | | |
| **A2** | **Yes** | **Some what** | **No** | **I don't note** | |
| | **68.6%** | **27.9%** | **3.48%** | **-** | |
| **Q3** | **What type of acaricide which used to control ticks?** | | | | |
| **A3** | **Cypermetrine** | **Ivermectin** | **Diazinon** | **Others** | |
| | **80.23%** | **17.44%** | **2.32%** | **-** | |
| **Q4** | **What type of acaricides application ?** | | | | |
| **A4** | **Hand dressing** | **Spot on** | **Pour on** | **Machine spraying** | **others** |
| | **55.81%** | **12.2%** | **22.09%** | **9.88%** | **-** |
| **Q5** | **Are you aware about exact recommended concentration?** | | | | |
| **A5** | **yes** | **Some what** | **roughly** | **No** | |
| | **38.37%** | **58.13%** | **3.48%** | **-** | |
| **Q6** | **Which of followings included in acaricide application** | | | | |
| **A6** | **animals** | **Animals+yard** | **Animal+yard+ surroundings** | | |
| | **73.83%** | **20.93%** | **5.23%** | | |
| **Q7** | **From which you built animal house** | | | | |
| **A7** | **Clay** | **Brick** | **Cement block** | **Reeds** | **Other** |
| | **55.81%** | **4.07%** | **39.53%** | **0.58%** | **-** |

Q=question A=answer

## Discussion

The prevalence of theileriosis may vary from area to area due to many factors, including climatic conditions ,breed of animals ,distribution of vectors ,husbandry and methods of control of ticks. The results of present study showed significant difference ($P \leq 0.005$) in prevalence rate between the studied areas ,but the infection rates in these areas were less than rates recorded by (2) in 3 governorates in Kurdistan-Iraq. Also the present study revealed that the conventional methods still effective in diagnosis of theileriosis ,particularly the acute form ,this fact was proved by many authors (10 , 11) .

Breed and age of cattle are the main risk factors associated with prevalence of theileriosis. Sayin (12) recorded that the Friesian breed were more susceptible than cross-breed, while the local breed showed less susceptibility to theileriosis ,these findings are exactly matched with the results of this study. On the other hand, the high susceptibility of young animals is in agreement with findings of other authors ( 13,14).

The results showed marked correlation between the infestation rate of ticks and season, laboratory investigation identified 3genera include, *Hyalomma spp*., *Boophilus spp*. and *Rhipicephalus spp*.. The highest percentage those of *Hyalomma* followed by *Boophilus* and *Rhipicephalus*, these results were close to other surveys in some Iraq's provinces include Diwanyia, Nassiryia, Kerbala and Hilla (15) Baghdad (16) Nineveh (17) in Basra (18) Diwanyia (19). The predominant of *Hyalomma* (vector of theileriosis) may be due to their ability to tolerate the dry and harsh environment (20).

The data obtained from questionnaire were represent in table 3, 68.6% of owners were note increase in tick population in last years and they thought the main cause is increased of uncultivated land due to scarcity of water and continuous military operations in these areas. The correlation between the mismanagement features obtained by questionnaire and high prevalence rate of both theileriosis and acariasis in present study may be explained by documentation of many authors such as Gacholi(21) whose reveal the importance of field factors in acquired of theileriosis , Pegram(22) who noted that the clay and stony animal houses give suitable conditions to ticks,



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Gitau (5) whose recorded that the open grazing sysem increase the exposure of cattle to theileriosis .The accurate use of acaricides especially in absence of vaccine against Theileria in Iraq is the main control procedure to theileriosis,so the choice of acaricide and method of application may decrease the effectiveness of acaricide or lead to development of resistance against it (23 ,24 ,25 ) .

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