

Prevalence of Bovine Sarcocystosis in Babylon province

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Abstract:

The study was carried out to determine the prevalence of bovine sarcocystosis in slaughtered cattle in Babylon abattoir by use two methods, trichoscopy and histological techniques, The results showed that the prevalence rate of microscopic form *Sarcocystis cruzi* detected by trichoscopy and histological technique were 66.5 % and 70% respectively. According to examined organs, the higher percentage recorded in esophagus 64%, and least percentage in diaphragm 47%, also the prevalence in females 79.03 % was higher than males 60.86%. In addition, the results revealed that the infection rate increased with the age and the higher percentage was observed in animals 2-6 years, while the lowest was recorded in animals aged 6-12 months.

Key word : Bovine Sarcocystosis, Veterinary Parasitology

انتشار داء الحويصلات الصنوبرية في أبقار محافظة بابل

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الخلاصة:

أجريت الدراسة لتحديد نسبة الخمج لداء الحويصلات الصنوبرية في الأبقار المذبوحة في مجزرة بابل باستخدام طريقتي منظار الشعريات والتقطيع النسيجي، أظهرت النتائج إن نسبة انتشار الشكل المجهرى *Sarcocystis cruzi* بطريقة منظار الشعريات والتقطيع النسيجي هو 66.5% و 70% على التوالي. طبقاً إلى الأعضاء المفحوصة، سجلت أعلى نسبة في المريء 64%، وأقل نسبة في الحجاب الحاجز 47%، كذلك انتشار الداء في الإناث 79.03% أكثر من الذكور 60.86%. إضافة إلى ذلك، أظهرت النتائج إن معدل الخمج يزداد مع العمر وإن أعلى نسبة ظهرت في حيوانات 2-6 سنوات، بينما سجلت أقلها في الأعمار 6-12 شهر.

Introduction:

Sarcosporidiosis (sarcocystosis) is a parasitic disease caused by intracellular protozoa of the genus *Sarcocystis*. The biological cycle of these parasites is based on a prey-predator relationship between a definitive host usually carnivores and an intermediate host usually herbivores, omnivores, rodents, and birds (1). All

species of *Sarcocystis* complete the life cycle in specific intermediate and definitive hosts or within closely related host species (2). Domestic cattle, and other species of the genera *Bos*, *Bison*, and *Bubalus*, can act as an intermediate host for *Sarcocystis cruzi*, *Sarcocystis hominis*, and *Sarcocystis hirsute*(3). The definitive

hosts of *S. cruzi* (microscopic form) are domestic and wild canids (*Canis latrans*, *Canis lupus*, and *Vulpes vulpes*), while for *S. hirsute* (macroscopic form), the definitive hosts are wild and domestic cats (*Felis catus*) (4). In addition, the human considers the definitive host for *S. hominis* (2).

The genus *Sarcocystis* is composed of about 130 species of heteroxenous cyst-forming coccidia with differences in life cycle and pathogenicity, pathogenic *Sarcocystis* spp. can cause disease in their intermediate host, in particular, in cattle, sheep, and pigs (5).

Cattle are common intermediate hosts of sarcocysts and the prevalence of *Sarcocystis* in adult bovine muscle is close to 100% in most regions of the world (6). Bovine sarcocystosis is caused by *S. cruzi*, the most pathogenic species, and is known to cause considerable morbidity and mortality in cattle (7).

Sarcocystosis in cattle can cause perivascular monocyctic infiltration, petechial hemorrhages, weakness, fever, abortion in pregnant females, encephalomyelitis, and also death in cases of massive infestation (8, 9, 10, 2).

Materials and Methods:

Samples collection:

A total 200 animals (138 males and 62 females) were examined in Babylon abattoir from December 2011 to May 2012. The diaphragm and esophagus muscles were collected after the slaughtering and placed in labeled containers and submitted as soon as to laboratory in cool box. In laboratory, each sample was divided according to method of examination into two portions as following:

1- Trichinoscopy method:

This method was carried out according to (11), 0.5gm from sample was putted between two slides with applying until become close to transparent sample, then examined by light microscope 10X for search about microscopic sarcocyst.

2- Histological technique: the specimens washed with normal saline (0.9%) and then placed in 10% formalin solution, 5-7mm histological sections were prepared according to procedure described by (12, 13).

3- Statistical analysis: The results of Prevalence of Bovine Sarcocystosis were statistically analyzed by Chi square according to (14).

Results and Discussion:

The results of trichinoscopy method revealed the microscopic form in bovine *Sarcocystis cruzi* in 133 out of 200 animals in prevalence rate 66.5%, the microscopic sarcocysts appeared in different shapes embedded in muscle fiber (figure 1,2), this prevalence rate was agreement with results of many authors whom study bovine sarcocystosis, including (15), (16), (17), and (18) whose recorded infection percentages in cattle 71.5%, 60.93%, 69.3%, 74.2% respectively.

According to examined organs, the results were appeared significant variation ($P < 0.05$) which recorded percentage of infection was higher in esophagus 64%, while it was 47% in diaphragm as presented in table (1). Many studies were referred high percentage of infection in esophagus either in cattle and Buffaloes such as (19) in cattle of Belgium, (20) in bovine carcasses of Kolkata, and (21) in water buffalo in Vietnam.

Table (1): The infection rate according to types of examined organs by trichinoscopy.

Types of organ	Number of examined organs	Number of infected organs	Percentage %
Esophagus	200	128	64 a
Diaphragm	200	94	47 b

* Chi square value: 11.7

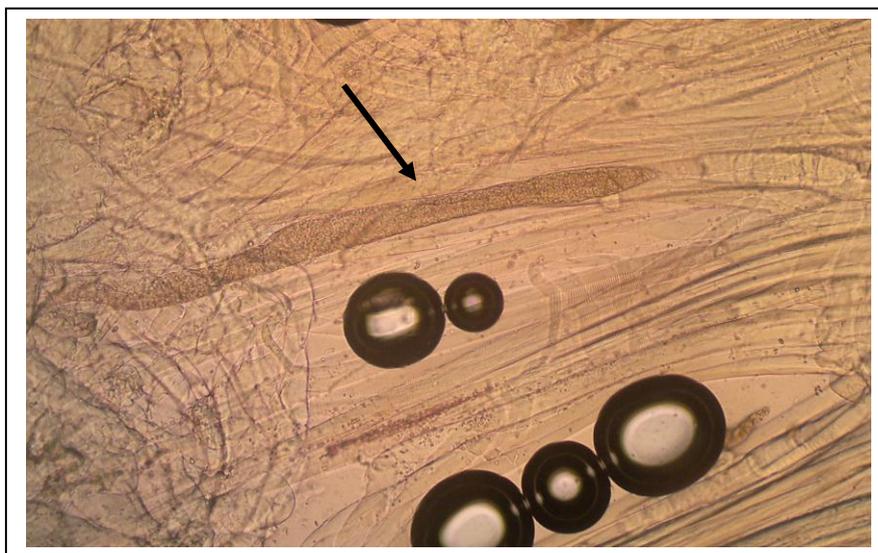


Figure (1): The microscopic cyst in esophagus by trichinoscopy (10X).

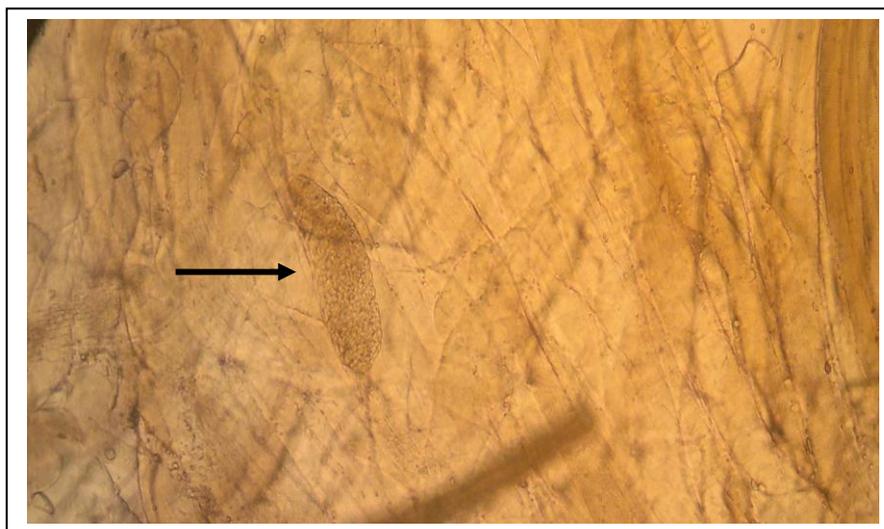


Figure (2): The microscopic cyst in diaphragm by trichinoscopy (10X) .

Depending on the sex of examined animals, results were appeared significant variation ($P < 0.05$) which revealed that the higher percentage of infection was in females 79.03%, while in males it was 60.86 % table (2), these results were identical with results of (22) in sheep of Babylon province, where he recorded infection rate in females 53.85% and

males 39.16% , while (20) in cattle of India, and (23) in water buffalo in Iran were referred to higher percentage in males comparative with females, this may be due to the breeding system for animals in our areas where are most small herds in Iraq consist of many females with less numbers of males.

Table (2): The infection rate according to sex of examined animals by trichinoscopy.

Sex	Number of examined animals	Number of infected animals	Percentage %
Males	138	84	60.86 a
Females	62	49	79.03 b

* Chi square value: 6.34

Also, the results were showed that significant variation ($P < 0.05$) in ages of examined animals, the higher infection rate was in animals aged 2-6 years (87.32%)

while it was 30.76% in animals aged 6-12 months table(3). These results were in agreement with (22, 24, , 21).

Table (3): The infection rate according to age of examined animals by trichinoscopy.

Age	Number of examined animals	Number of infected animals	Percentage %
6-12 months	26	8	30.76 a
1-2 years	103	63	61.16 b
2-6 years	71	62	87.32 c

*Chi square value: 7.75

In other hand, The results of histological technique showed that the infection percentage was 70% and the microscopic form of sarcocysts were embedded between tissue fibers figure(3), these results were close to finding of (22) whose recorded prevalence rate of 62.79% in sheep of Babylon province, (25) whose recorded 64 % in sheep of Mosul city, and

(26) whose recorded 65% in water buffaloes of Phillipine, while (23) were recorded high percentage reached to 83% in water buffalo of Iran. Table (4) revealed no significant variation in infection percentages about the Comparison between trichinoscopy and histological techniques in detection of bovine sarcocystosis in different organs.

Table (4): The infection rate by trichinoscopy and histological techniques.

Method	Number of examined animals	Number of infected animals	Percentage %
Trichinoscopy	200	133	66.5 a
Histological	40	28	70 a

* Chi square value: 0.18

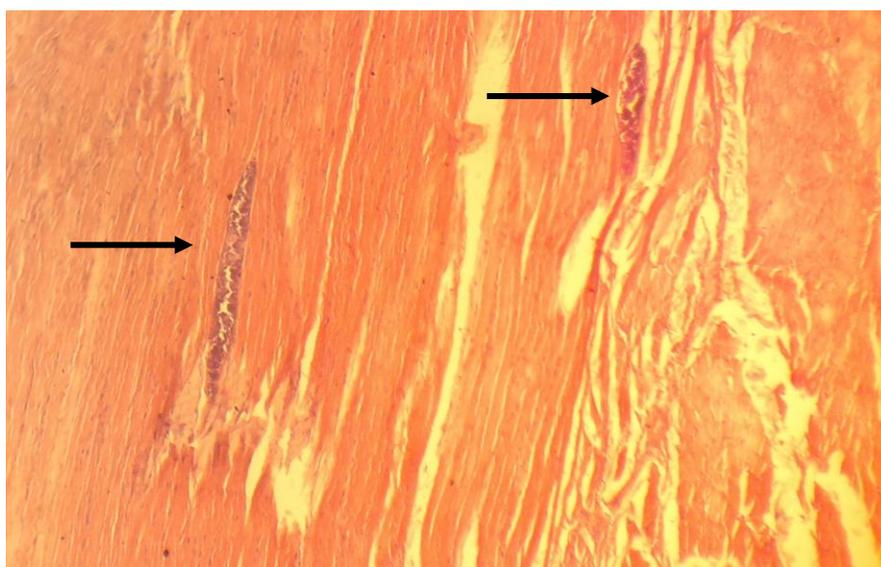


Figure (3): The microscopic cyst in esophagus by histological technique (Hematoxylin – Eosin stain). (10X)

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