Research Article

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Prevalence of *Eimeria spp* in buffaloes in Mosul city

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Abstract

The present study was conducted to estimate the prevalence of *Eimeria sp* . In buffalo from different regions of Mosul city included (Al-Kabat, Al-Shalalate, Badosh, Al-Rahmania) ,150 Fecal samples was examined form 2019-2020. The total infection rate was (38%) , five species were diagnosed; they are *E.bovis* 32%, *E.subspherical* 22.7% , *E.zuerni* 18.7% , *E. ellipsoidalis* 16.7% , *E. auburnensis* 6.7% . the study showed the higher infection rate by *Eimeria bovis* , The mixed infection with more than two species of Eimeria represented the highest rates and it was reported in 49.1%. The infection rate in the young animals(1-2 years) was higher (89.3) comparing to the rate in the a dult , according to the sex there is no significant difference between the male 33.3% and female 41.1% . histopathological examination characterized by emergence of different stages of parasite in the epithelium of intestinal, construction of intestinal gland cavities , severe hyperplasia of epithelial cell and presence of oedema between muscle fibers with infiltration with inflammatory cell .

Keywards: Buffalo, Eimeria, Oocyst, histopath.

دراسة انتشار أنواع الايميريا في الجاموس في مدينة الموصل

الخلاصة

أجريت الدراسة الحالية لتقدير مدى انتشار طفيلي *Eimeria spp.* في الجاموس في مناطق مختلفة من مدينة الموصل شملت كل من الغابات ،الشلالات ،بادوش، الرحمانية .حيث تم فحص 150 عينة براز للفترة من 2019 ولغاية 2020. وكشفت الدراسة ان نسبة االخمج الكلية بجنس الايميريا في الجاموس بلغ 38% وتم تشخيص خمسة انواع من الايميريا وهي , *E.zuerni* 18.7% *E.ellipsoidalis* 16.7% *E.uburnensi* 6.7% *E.subspherical* 22.7% ,*E.bovis* 32% كما اظهرت الدراسة ان اعلى نسبة للخمج كانت بالنوع *E.bovis* , وان نمط الخمج المختلط كان الاعلى اذ بلغ 49.1%

وقد كانت نسبة الخمج في الحيوانات ذات الاعمار الصغيرة مابين 2-1 سنة اعلى اذا بلغت89.3 مقارنة بنسبة الخمج في الحيوانات ذات الاعمار الكبيرة، في حين لم يتم تسجيل اي فرق معنوي في نسبة الخمج بين الذكور والاناث .كما بينت نتائج الفحص النسيجي عن وجود تغيرات مرضية متمثلة بوجود الوذمه بين الالياف العضلية مع فرط تنسج في ظهارة الامعاء اضافة الى وجود المراحل التطورية للطفيلي وارتشاح في الخلايا الالتهابية.

Introduction

Coccidiosis is aprotozoan disease affecting various animals (1). The disease is caused by *Eimeria spp* , there are 13 known species of *Eimeria* , but not all are pathogenic , only two species are pathogenic to cattle; *Eimeria bovis* and *Eimeria zuernii* causing bloody diarrhea especially in calves (2). the incidence of the disease in animals depends on many factors like species of Eimeria , age of the infected animals and managemental practices (3).coccidiosis responsible for huge economic losess in term of mortality and morbidity (4). the infection occurs by ingestion of contaminated food and water with the sporulated oocysts, which produce dehydration ,anorexia ,weakness,severe diarrhoea dysentery , and increased susceptibility to the other diseases (1) . In Iraq (5) refered that total rate of infection with *Eimeria spp* . in cattle was 25.71% and in Pakistan (6) refered that *Eimeria bovis* was (6.6%)

This study aimed to investigate the presence of *Eimeria* species and studying the intestinal pathological changes in buffalos in Mosul city.

Materials and Methods

Collection of sampls:

In this study 150 buffaloes fecal samples were collected randomly, the animals were of local breeds of both sexes between (1-8) years. The sample labelled and brought to the laboratory of parasitology in the college of veterinary Medicine, university of Mosul. In slaughterhous pieces of intestine samples were collected ,wet smears of intestine Mucosa stained with Giemsa for examination of *Eimeria sp*,

Laporatory examination

direct smear and flotation technique were used for the examination of the fecal samples (7). The positive samples of *Eimeria* oocyst were subjecetd to sporulation in 2.5% potassium dichromate . the Identification of *Eimeria* species was performed as described by(8).

Histopathological examination

intestine were collected and fixed in 10% buffered formalin for hematoxylin and eosin staining using histopathological techniques (9) .

Statistical analysi

The data were analyzed statistically by using chi-squaer (Jandel sigma stat scientific software V3.1) .

Results and Discussion

Coccidiosis is one of the important disease with economic impact to the ruminants in the world. In the present study, out of the 150 fecal samples 38% were positive for coccidial oocysts in the Mosul city of Iraq . The infection rate was higher than that reported in Babylon Governorate which was 16% (10), lower than study in the Haryana in wich was 57.84% (11) the difference might be due to the differences in the climate of the regions and type of anti coccidial drugs that used (12) .

Our results show five *Eimeria sp*. Were diagnosed in naturally infected buffoloes , *Eimeria bovis , E.subspherical , E.zuerni , E.ellipsoidalis , E.auburnensis* . Highest

prevalence was recorded in *Eimeria bovis* was 32% followed by *Eimeria subspherica* 22.7% and least prevalence was recorded in *Eimeria auburnensis* was 6.7% .

These results are in agreement with those described by (13) the difference of infection rates may have relation to immunity status of the animals , environmental conditions , stress factors , amount of contamination of the pastures (14) . The infection rate of *Eimeria spp* recovered from buffaloes are illustrated in table 1 .

Table 1: The infection rate and intensity of *Eimeria sp* in buffaloes

	Type of *Eimeria sp.*	Number of infected Sample	Percentage of infection (%)	The intensity of infection
1	*Eimeria bovis*	48	32	High Low
2	*E . subspherica*	34	22.7	middle
3	*E. zuerni*	28	18.7	middle
4	*E.ellipsoidalis*	25	16.7	middle Iow
5	*E. auburnensis*	10	6.7	Iow

High Total 50 oocyst/HPF.

Middle 10-15 oocyst/HPF.

Low 5 oocyst/HPF

The Differentiation of *Eimeria spp* was based on Morphometric measurements of the oocyst, are inagrement with those explained by (8). table 2 and (fig 1,2,3).

Fig.1:oocyst of *Eimeria bovis* 40X by using digital camera

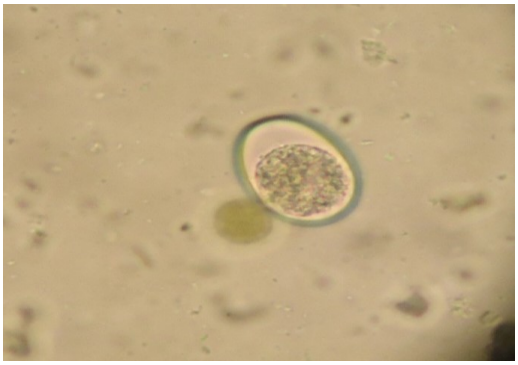

Fig2:oocyst of *Eimeria auburnensis* 40X by using digital camera

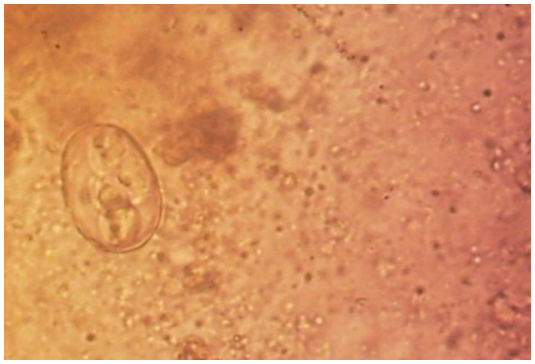

Fig3: oocyst of *Eimeria ellipsoidalis* 40X by using digital camera

The rate of infection was high in young animals compared with that in adult ,the statistical analysis it was found that there is asignificant difference between the ages while no significant difference between male and female. these results are similar to results of (11) who noticed that young animals are more susceptible to coccidosis and found that adult animals develop some type of immunity to infection and no significant differences of the infections between in male and female ,these results similar to those described by (10) who reported that the male and females affected equally to the predisposing factors of infection.(Table 3)

The results indicated the percentage of mixed infection with more than two species of Eimeria were formed the highest infection rates were (49.1%) compared to single infection (14%) with significant difference was observed between them. this results is similar to that described by (5), there was a significant differences between single , double and mixed infection . the difference between the types of infection may be related to various factors such as contamination of pasture with oocyst and difference of the anticoccidial program (15) . table(4) .

Histological study :-

The results of scraping stained with Giemsa stain showed presence of development stage of *Eimeria* . The pathological effects revealed the emergence of different stages of parasite in the epithelium of intestinal and hyperplasia of epithelial cells of intestine with odema between the muscle fibers in intestine and infiltration with inflammatoy cells.this study was less or more similar to those reported in buffaloes by (16). The different stages of parasite in the epithelium of intestine which were observed in the present study were in similar with (9) who detected that the number of different gametogenic stages of *Eimeria* parasite were observed throughout the villus and crypts of lieberkuhn. (fig4,5)

Table 2: The dimenations and characteristic features of oocysts of *Eimeria sp*. diagnosed in fecal samples of buffaloe

	Species	Oocyst size (µ) Rang	mean±st	morphology	The color	micro pyle
1	*E.bovis*	(23.3-34.5)×(17-23)	28×20.5 0.8±0.6	ovoid	greenish brown	+
2	*E.subspherical*	(10-13)×(8.5×13)	11.5×9.8 0.7±0.2	subspherical	colorless	-
3	*E.zuerni*	(14-16)×(21.7-23)	(18.5×15.2.) 2±1.6	subspherical	Pale yellow	-
4	*E.ellipsoidalis*	(15-26)×(12-18)	(16×12.6) 0.9±0.3	subspherical	Pale yellow	-
5	*E.auburnensis*	(30-45)×(19.3-24)	(27.6×22.9) 1.9±1.5	ovoid	Yellowish brown with papillary surface	+

Table 3 :- The infection rate of *Eimeria spp*. According to the sex and age in buffaloes.

sex / age years	Male				Female	
	Number of examined buffaloe	Number of infected animals	The infection rate %	Number of examined buffalo	Number of infected animals	The infection rate %
1-2	20	15	75[a]	28	25	89.3[a]
3-5	25	4	16[b]	38	8	21.1[b]
5-8	15	1	6.7[b]	24	4	16.7[b]
Total	60	20	33.3[A]	90	37	41.1[A]

Different letters vertically indicate a significant differences at p≤0.05.

Fig.4:congestion in the serosa of small intestine in buffalo

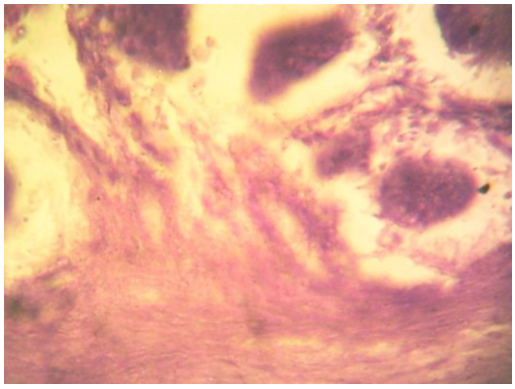

Fig.5: Schizont of *Eimeria spp* in histopathological sectio of intestine of buffalo 100X by using digital camera

Conclusion

This study was conducted to estimate the prevalence of *Eimeria sp* in buffaloes in Mosul city . The total infection was 38% and five species were diagnosed .the infection rate in the young animals was higher comparing to adult,according to the sex there is no significant difference between male and female .

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