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PREVALENCE OF INTESTINAL PROTOZOA IN THE SHEEP, THEIR BREEDERS AND NON-BREEDERS IN BABYLON GOVERNORATE/IRAQ

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ABSTRACT
The present study was conducted to investigate the cyst and trophozoites infection in sheep and their breeders as compared with non-breeders. Three hundred fecal samples from sheep, breeders and non-breeders were collected from different locations in Babylon during the period from 1 September to 31 December 2016. Fecal samples were subjected to test directly and by staining methods to detect the intestinal protozoa cysts and trophozoites. Results revealed that the highest prevalence was 73.33% in sheep, 66.66% in their breeders, and 12% in the non-breeders. The differences among prevalence was significant (P<0.0001). The statistical analysis showed that the breeders are significantly (P<0.0001) at risk (OR=14.66; 95% CI 6.29-34.17) as compared with non-breeders and the sheep are also are significantly (P<0.0001) at risk (P<0.0001) (OR=20.16; 95% CI 9.19-44.20) as compared with non-breeders. The differences in the infection rate between male and female were not significant in non-breeders, breeders and sheep. Although the results showed that males are at risk (OR=2.13) (P=0.36) in non-breeders, (OR=1.78) (P=0.27) breeders, and (OR=1.21) (P=0.58) sheep as compared with the females but with no significant effect. The differences in infection rate among non-breeders, breeders, and sheep were significant in all studied months. The breeders and sheep are significantly at risk compared with non-breeders in all studied months. In conclusion the present study confirmed the association infection by intestinal protozoa between breeders and sheep. So it is very important to adopt a routine test for early diagnosis the infection in each of the sheep and their breeders.

KEYWORDS: Protozoa, Sheep, sheep breeder's non-breeders.

INTRODUCTION

Parasitic diseases are spread worldwide. They caused a significant illness and deaths in people of the developing countries. The base of these diseases is mostly a zoonotic nature (Ortega *et al.,* 2008). The livestock animals, domestic pets, and open farms caused several zoonotic outbreaks (Chalmers *et al.,* 2011). Enteric protozoa caused diarrhea, which is a relatively frequent symptom and asymptomatic colonization (Cama and Mathison, 2015). Infections usually occur through ingestion of the cysts/ oocysts, contaminating the raw food or drinking water (Baldursson and Karanis, 2011; Torgerson *et al*., 2015). However, diarrhea is accurate sign to identify the parasite in a patient's feces for all protozoa but, some intestinal protozoa such as *Giardia duodenalis*, and *Entamoeba histolytica* have been shown to cause diarrhea in humans (Agholi *et al.,* 2013). The estimations of prevalence of the intestinal protozoa differed due several factors such as breed, gender, location, age, method of detection, and sample size (Hussin *et al.,* 2015; Hussin *et al.,* 2016). Hence, the present study aimed to determine the prevalence of the intestinal protozoa and to evaluate the risk factor of gender in Babylon South of Iraq.

MATERIALS & METHODS

A cross section study was conducted to determine the prevalence of the intestinal protozoa and to evaluate the risk factor of gender in Babylon South of Iraq during the period from 1 September to 31 December 2016. This study included 300 fecal samples belonged to 150 sheep, 75 breeders and 75 non-breeders who are not contact with sheep and apparently healthy. The age of sheep ranged from >1 to 5 years and the age of breeders ranged 15-43 years and non-breeders 17-41 years. The fecal samples were subjected to tests for the detection of trophozoites or cyst stages of intestinal protozoa. The methods which were used for detection of protozoa included direct smear method, concentration method and modified Ziehl-Neelsen according to Markell *et al.* (1986).

Statistical analysis

Data were subjected to analysis using SAS (2010). The differences among infection rates were assessed by Chi-Square test. P< 0.05 is considered significant.

RESULTS & DISCUSSION

The results of the current study showed that the overall infection rate of intestinal protozoa in sheep in Babylon was 73.33% in sheep, 66.66% in breeders and 12% in non-breeders. The differences among prevalence in sheep, breeders, and non-breeders are significant (P<0.0001) as shown in Table (1). These results confirm that the intestinal protozoa are a zoonotic disease as the high prevalence in breeders associated with high prevalence in sheep. The breeders are significantly (P<0.0001) at high risk to infect (OR=14.66; 95%CI 6.29-34.17) as compared with non-breeders also sheep are significantly (P<0.0001) at high risk (OR=20.16; 95%CI 9.19-44.20) as compared with non-breeders. The results of this study agreed with results obtained by Makawi *et al.,* (2016) who reported that the prevalence was 83.33% in sheep, 72% in breeders,

and 8% in non-breeders. Also our estimation of prevalence (73.33%) is close to 85% in lambs which was obtained by Abd Al-Wahab (2003) in Baghdad. Table (2) showed that differences in infection rates between males and females were not significant in all three groups. Although the results showed that males are at high risk (OR=2.13) (P=0.36) in non-breeders, (OR=1.78) (P=0.27) breeders, and (OR=1.21) (P=0.58) sheep as compared with the females but with no significant effect. The non-significant effect of gender could be attributed to the exposure of both sexes to same environment, management, and pathogenic factors (Minnat, 2014).The current results are consistent with results obtained by Al-Gelany (2003), AL-Shaheen *et al.* (2007) and Makawi *et al.* (2016).

TABLE 1: The prevalence of the intestinal protozoa in non-breeders, breeders and sheep in Babylon

Group	No. infected	Non-infected	Prevalence%	Odds Ratio (OR)	95% CI OR	P
Non-breeders	9	66	12%	Reference		
Breeders	50	25	66.66%	14.66	6.29-34.17	<0.0001
Sheep	110	40	73.33%	20.16	9.19-44.20	<0.0001
Chi-square value	80.80					
P	<0.0001					

TABLE 2: The prevalence of the intestinal protozoa in non-breeders, breeders and sheep in Babylon according to gender

		Total No.	No. Infec.	Infec. Rate%	Odds Ratio (OR)	P
Non-breeders	Female	27	2	7.04	Ref.	-
	Male	48	7	14.58	2.13	0.36
Chi square value				0.84		
P				0.35		
Breeders	Female	21	12	57.14	Ref.	-
	Male	54	38	70.37	1.78	0.27
Chi square value				1.19		
P				0.27		
Sheep	Female	67	46	68.65	Ref.	-
	Male	88	64	72.72	1.21	0.58
Chi square value				0.30		
P				0.58		

TABLE 3: The prevalence of the intestinal protozoa in non-breeders, breeders and sheep in Babylon according to months

		Total No.	No. Infec.	Infec. Rate%		
September	Non-breeders	20	2	10	Ref.	-
	Breeders	20	11	55	11.00	0.005
	Sheep	30	17	56.66	11.76	0.003
Chi square value				12.35		
P				0.002		
October	Non-breeders	20	3	15	Ref.	-
	Breeders	20	14	70	13.22	0.001
	Sheep	40	28	70	13.22	0.0003
Chi square value				18.43		
P				<0.0001		
November	Non-breeders	20	2	10	Ref.	-
	Breeders	20	16	80	36.00	0.0001
	Sheep	40	33	82.5	42.42	<0.0001
Chi square value				33.37		
				<0.0001		
December	Non-breeders	15	2	13.33	Ref.	-
	Breeders	15	9	60	9.75	0.01
	Sheep	40	32	80	26.00	0.0001
Chi square value				20.47		
				<0.0001		

The differences in infection rate among non-breeders, breeders, and sheep were significant in all studied months (Table 3). The highest infection rate in non-breeders (15%) was detected in October while the highest infection rate in breeders (80%) and sheep (82.5%) was reported in November. The breeders and sheep are significantly at high risk compared with non-breeders in all studied months. The highest estimations of the OR were 36.00 and 42.42 for the breeders and sheep respectively.

CONCLUSION

The present study confirmed the association infection by intestinal protozoa between breeders and sheep. So it is very important to adopt a routine test for early diagnosis the infection in each of the sheep and their breeders.

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