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PREVALENCE OF BABESIA, THEILERIA AND EVALUATED OF SOME BLOOD PARAMETERS IN CAMELS IN AL NAJAF PROVINCE

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ABSTRACT
An epidemiological study was conducted about the occurrence of Babesia and theileria infection in local camels in AL-Najaf provenance by using Giemsa stain with changes in some hematological parameters in infected camels compared with healthy. A total Prevalence rate of infection was 34.8%. Babesia recorded high rate of infection 19.5%, compared with theileria 15.2%. A significant difference was recorded between age of camels the highest rate of infection recorded in animals less than 3 years in babesia (78.05 %) and theileria (75%). However the male camels recorded high infection rate 51.21% and 9% for babesia and theileria as compared with females (48.79 and 6.2%) but the differences were not significant variation .In relation to season of infection with babesia and theileria recorded a high rate of infection in rainy season. Hematological study revealed that statistically significant decreases ($p< 0.01$) in RBC counts, HB concentration and PCV in infected camels as compared to healthy.

KEYWORDS: camel, infection, babesia, theileria, PCV.

INTRODUCTION

Camel is an important multipurpose animal and since the old times, it has been used for transportation and produce meat, milk and wool in the world (Kamani *et al*., 2008). Although camels are resistant animals and can tolerate the harsh conditions of arid regions because of their unique adaptive physiological characteristics, these animals appearance a wide variation of diseases (Swelum *et al*., 2014), (Karimi *et al*., 2014). Haemopotozoal are known to affect the health of camels leading to anemia, wasting and death in heavy infection (Mahran, 1989). Theileriosis is an important haemopotozoia disease of animals inducing a variety of clinical manifestations ranging from a subclinical presentation to a fatal disease depending, in part, on the animal species, host, age and the species of the microorganism. Theileriosis caused by species of the genus Theileria has a wider distribution extending from North Africa to China (Mukhebi *et al*., 1992). Piroplasmids belonging to the genera Babesia are supposed of infecting dromedaries (Egbe-Nwiyi *et al*., 1994), but data so far are limited (Swelum *et al*., 2014). The significant effect of Babesia infections are reported in domestic animals, some wild life species. These tick-borne apicomplexan were generally considered as highly specific for a given host species (Uilenberg, 2006).

MATERIALS & METHODS

Study area

The study was carried out in the AL. Najaf province; an arid region in center of Iraq has a climate which mostly resembles dry desert climate with the mean temperatures of 40.67 and 50.8°C, respectively. Camels were kept by local farmers and were fed low quality diets containing mainly straw, barley and wilted grass.

Sample collection

210 Blood sample was collected from the severed jugular vein and ear vein for parasitological and hematological study

Parasitological examination

A- Thin Blood smear: Blood samples were collected from ear veins and small drop of fresh blood were placed at the end of one slide and by the other slide in angle of forty fife touched the drop of blood by the end of the slanted slide so the blood run the space beneath it. The slanted slide was drawn quickly and the blood was pulled behind as previously mentioned (Zweygarth *et al*., 2002). The blood smear was died in air, fixed by absolute methyl alcohol and was stained with Giemsa 10% for 20 minutes in neutral phosphate buffer saline then was washed and dried. The slide was then allowed to dry prior to microscopic examination at 100x magnification.

B-Thick Blood smear: The direct wet smears were prepared by placing the blood samples on a glass slide and cover with a cover-slip to spread blood as a monolayer of cells and the examined with the high dry objective (40 X) (Zweygarth *et al*., 2002).

2-Hematological examination: Blood samples were collected from of each camel during slaughter with a sterile tube containing Sodium Ethylene Diamine Tetra Acetic acid (Na2ETDA) as an anticoagulant and labeled appropriately. The tubes were gently rotated to ensure proper mixing of the blood with the anticoagulant (EDTA) without damaging the integrity and transported immediately in an ice pack to the University. Department of Veterinary Medicine Research Laboratory for hematological analysis. These samples were used in the same day for the examination of the blood total erythrocytes count (TEC) and total leukocytes count (TLC) were done according to (Feldman *et al*., 2000), Packed cell volume (PCV: Frankle and Reitman, 1963) and hemoglobin (Hb: Benjamin, 1965).

RESULTS

Total Rate of infection with babesia and theileria in camels: The total prevalence rate of babesia and theileria infection in camels was 34.8%. Babesia species recorded (19.5%) rate of infection while theileria recorded (15.2%) without significant variation (Table 1).

TABLE1. Total Rate of infection with babesia and theileria in camels

Heamoprotozal	Number of examined (y = 210)	Number of positives (x)	Prevalence % (x/y X 100)
Babesia species	210	41	19.5%
Theileria species	210	32	15.2%
Total	210	73	34.8%

Total Rate of infection with Babesia and Theileria in related to age: According to age ,camels more than 3 year of age recorded 21.95% and 25% rate of infection with Babesia and Theileria respectively ,while recorded 78.05% and 75% in camels less than 3 year of age infection with Babesia and Theileria respectively without significant variation.

TABLE 2. Total Rate of infection with Babesia and Theileria in related to age

species	age	No.infected (%)	95% CI L-U	Chi square	p-value
Babesia	< 3	9 (21.95%)	9.3-34.6	12.90	<0.001
	> 3	32 (78.05%)	65.4-90.7		
Theileria	< 3	8 (25%)	10.0-40.0	8.00	<0.01
	> 3	24(75%)	60.0-90.0		

Total Rate of infection with Babesia and Theileria in related to sex : In related to sex male recorded high rate of infection with Babesia and Theileria_ infection 51.21% and 9% respectively ,female recorded 48.79% and 6.2% in Babesia and Theileria_ infection respectively .

TABLE 3. Total Rate of infection with Babesia and Theileria in related to sex

species	sex	No. infected (%)	95% CI L-U	Chi square	p-value
Babesia	Male	21 (51.21%)	35.90-66.50	0.02	0.87
	Female	20 (48.79%)	33.50-64.10		
Theileria	Male	19 (9%)	42.40-76.40	1.12	0.28
	Female	13 (6.2%)	23.60-57.60		

Total Rate of infection with Babesia and Theileria_ in related to season of study: Babesia and Theileria_ infection in camels were found more prevalent during the rainy season than in the dry season .There was a statistical significant difference between the seasons and occurrence of infection ($p < 0.001$) (Table 4).

TABLE 4. Total Rate of infection with Babesia and Theileria in related to season of study .

Species	Season	No. infected (%)
Babesia	Rainy	28 (13.3%)
	Dry	13 (6.2%)
Theileria	Rainy	21 (10%)
	Dry	11 (5.2%)

Some of the hematological parameters changes in camel's infection: Hematological parameters showed decreased in level of RBCs, Hb and pcv in infection camels with Babesia and Theileria compare with healthy camels with significant increase level of WBCs in both infection compare with healthy camels:

TABLE 5. Some of the hematological parameters changes in camels infection with Babesia species

	Diseased camels	Healthy camels
Hb (g/dl)	8.34±0.25	12.61±0.12
PCV (%) ± SD	29.73±0.24	40.71±0.55
RBCs (106 /ml)	5.83±0.21	7.44±1.04
WBCs (103/ml)	16.72±0.61	12.33±1.27

TABLE 6. some of the hematological parameters changes in camels infection with Theileria species

	Diseased camels	Healthy camels
Hb (g/dl)	9.35±0.27	12.61±0.12
PCV (%) ± SD	26.83±0.40	40.71±0.55
RBCs (106 /ml)	3.85±0.29	7.44±1.04
WBCs (103/ml)	15.62±0.51	12.33±1.27

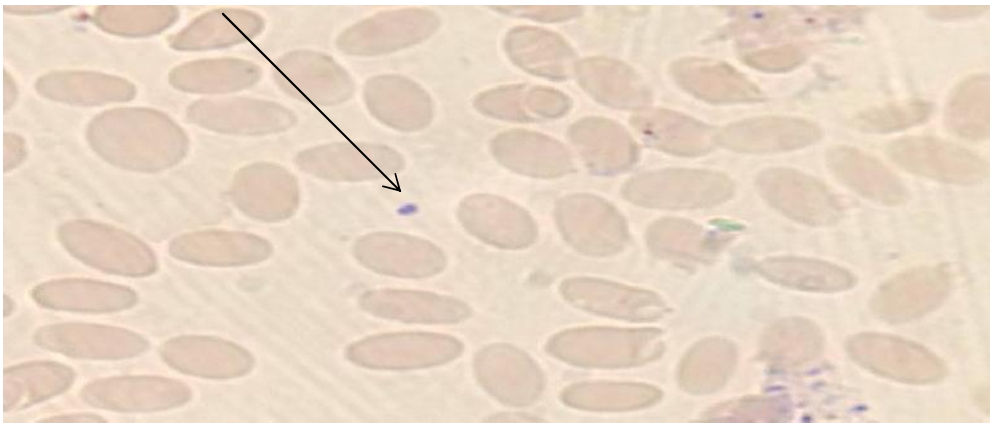

FIGURE 1. Giemsa stained thin blood smear showing Babesia infection outside of erythrocytes.

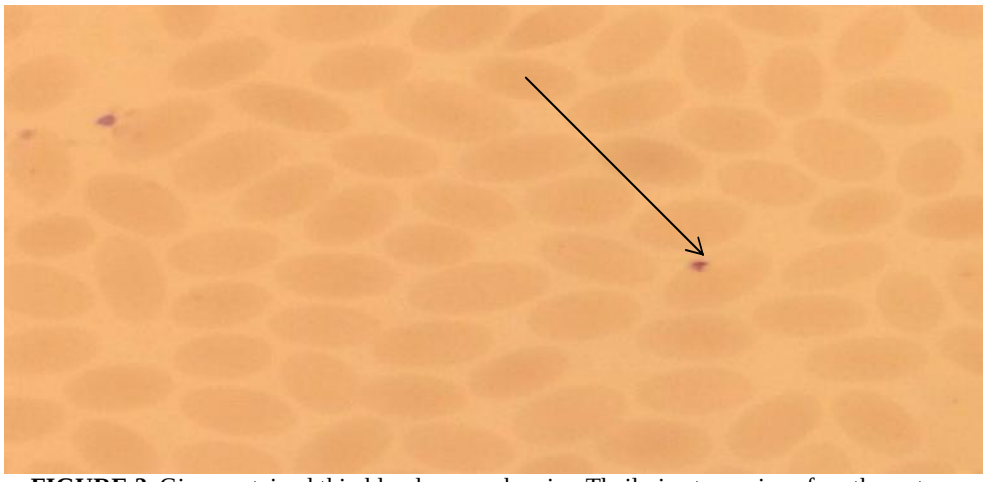

FIGURE 2. Giemsa stained thin blood smear showing Theileria at margins of erythrocytes.

DISCUSSION

The study recorded total prevalence rate of infection with Babesia and Theileria in camel 34.8% , higher than 14.2% rate that recorded by (Kamani *et al*., 2008) in Egypt and lower than 79.0% the recorded by (Rabana *et al*., 2011) in Nigeria , the difference were associated with many factors such as number of samples collected and environmental conditions changes in the Study area.

Babesia species recorded 19.5% rate of infection, while Theileria species recorded 15.2% without significant variations this result agreed with (swelum *et al*., 2014) in Saudi Arabia who recorded 13.1% and infection rate in Babesia and Theileria respectively due to similarity in Environmental condition and availability of arthropod vectors .

Camels older than 3 years of age recorded higher rate of infection than less camels with each Protozoan parasite the result The higher prevalence in old camels at this stage might be due to heavy stress through their use for transportation of goods from one place to another and secondly may be due to poor management .

No significant variations in the rate of infection were recorded between male and female camels ,this result . agreed with (Tadesse et al ., 2013) in Ethiopia, this attired to that both sexes Share equal chances of getting infection , same environmental conditions , same area of grazing and exposure Arthropoda vectors

Result showed that Babesia and Theileria infection to be mere frequently in rainy season than dry with significant variation and this due to abundance of arthropod.

Vector (tick) that play active role in transmission of these protozoa , especially during the rainy season which serves as favorable breeding season of arthropod lead to decrease the level of Hb and PCV than to hemolytic anemia and the significant increase of wBCs attributed to the immune defense mechanism of the host.

REFERENCES

Al-Khalifa, M.S., Hussein, H.S., Diab, F.M., Khalil, G.M. (2009) Blood parasites of livestock in certain Regions in Saudi Arabia. Saudi J Biol Sci 16: 63-67.

Bamaiyi, P.H., Kalu, A.U. and Ali, M. (2011) Haemoparasites of the trade Camel (Camelus dromedaries) arriving for slaughter at Maiduguri, Borno State, Nigeria. Continental J. Veterinary Sciences 5 (1): 18 –21.

Bancroft, J.D., Stevens, A. & Turner, D.R. (1996) Theory and practice of histological techniques. 4th ed. Churchill Livingstone, New York, USA.

Benjamin, M.M. (1965) Outline of Veterinary Clinical Pathology. 1st ed. New Delhi, India.

Bernawe, A. A. A. (2013) Trypanosoma of Imported Camels in SebhaProvince.International Journal of Engineering Science and Innovative Technology (IJESIT) 2 (2): 7–9.

Egbe-Nwiyi, T.N. & Chaudhry, S.U.R (1994) Trypanosomiasis: Prevalence and Pathology in Camels of arid zone of north eastern Nigeria. Pakistan Veterinary Journal, 144(1): 24-27.

Feldman, B.F., Zink, J.G. and Jain, N.C. (2000) Schalm's Veterinary Hematology. Lippincott Williams & Wilkins, Philadelphia, USA.

Frankle, S. and Reitman, S. (1963) Gradwash's Clinical Laboratory Methods and Diagnosis. Vol. (2). Hematology. Academic Press, London.

Gray, J. S. and Weiss, L.M. (2008) Babesiamicroti. In: Khan, N. (Ed.), Emerging Protozoan Pathogens. Taylor and Francis, Abingdon,UK, pp. 303–349.

Kamani J, Usman, T.A., Onyeamaechi, E.G., Usman, M.A., Kida, S.M. (2008) Hemoparasites of camels (*Camelus dromedarius*) in Maiduguri, Nigeria. Anim Res Int 5: 838-839.

Karimi, A., Rahbari, S., Yousefi, A. (2014) Blood parasites of camels from central regions of Iran: comparative evaluation of various detection techniques and serum protein components. J Adv Parasitol 2: 1-4.

Mahran, O.M. (1989)Some studies on Blood Parasites in Camels (*Camelus dromedarius*) at Shalatin City, Red Sea Governorate. J Eukaryot Microbiol 36: 422-423.

Mukhebi, A.W., Perry, B.D., Kruska, R. (1992) Estimated economics of theileriosis control in Africa. Prev Vet Med 12: 73-85. Journal 14: 24-27.

Rabana, J. L., Kumshe, H.A., Kamani, J., Grema H., Turaki, U.A. and Harrison, K. D. (2011) Effects of Parasitic Infections on Erythrocyte Indices of Camels in Nigeria. Veterinary Research forum, 2(1): 59 – 63.

Salih, D.A., Hussein, A.M. and El- Singla, L.D. (2015) Diagnostic approaches for tick-borne haemoparasitic diseases in livestock.J. Vet. Med. Animal Health, 7(2):45 – 56.

Schnittger, L., Rodriguez, A.E., Florin–Christensen, M., Morrison, D.A. (2012) Babesia: a world emerging. Infect.Genet.Evol., 12, 1788–1809.

Soulsby, E. J. L. (1982) Helminthes, Arthropods and Protozoa parasites of domesticated Animals, Bailere Tindal, London; pp. 232 – 233.

Swelum, A.A., Ismael, A.B., Khalaf, A.F., Abouheif, M.A. (2014) Clinical and laboratory findings associated with naturally occurring babesiosis in dromedary camels. Bull Vet Inst Pulaway 58: 229-233.

Tadesse, A., Omar, A., Aragaw, K., Mekbib, B. and Sheferaw, D. (2012) A Study on Camel Trypanosomosis in Jijiga Zone, Eastern Ethiopia, J. Vet. Adv., 2(5): 216–219.

Uilenberg, G. (2006) Babesia-a historical overview. Vet Parasitol 138: 3-10.

Zweygarth, E., Lopez-Rebollar, L.M. and Meyer, P. (2002) In vitro isolation of equine piroplasms derived from Cape Mountain zebra (Equus zebra zebra) in South Africa. Onderstepoort J. Vet. Res., 69(3):197-200.