

## DIAGNOSTIC STUDY OF HEMOPLASMOSIS IN CATS IN BASRAH CITY-IRAQ

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### ABSTRACT

The cats might severely affected and became carrier for *Hemoplasma* spp., so the current study were aimed to investigate hemoplasmosis in cate in Basarh city, Iraq. This work was conducted via examine (20) cats of local cat breeds in Basarh city, using their blood samples for stained smear and blood parameters. The Giemsa stained blood smears revealed seven (35%) cats infected with Hemoplasmosis. However, thirteen (65%) was found negative. Diseased cats show pale and or/icteric mucos membranes, dehydration, emaciation, loos of appetite, and weakness, Moreover , a significant increase of body temperature, respiratory and heart rate was indicated. Results was also show a significant decrease of RBC, HB and PCV of diseased cats which reflected Normocytic Normochromic type of anemia . *Hemoplasma* spp. of infected cats appears round or rod shape singular or chained located on the cell membranes of the infected erythrocytes . It was concluded that feline mycoplasmosis lead to deleterious effects which might terminated with death of affected cats .

### INTRODUCTION

Hemoplasmosis, formerly calls haemobartonellosis, is transmitted by tick, and affects red blood cells of cats to cause feline infectious anemia (1) There are three species of hemoplasma could infected cats included *Mycoplasma haemofelis*, *M. haemominutum* and *M. turicensis* (2). The *M. haemofelis* is consider the most pathogenic , and commonly hemoplasmosis can result in disease in immunocompromised cats (3, 4). Carrier cats often have subclinical infection, but

reactivation of infection can occur and may result in clinical disease (5). Generally the incidence of infection around the world is between 15-30% for cat population (6). Hemoplasmosis is register in cattle and sheep of Basrah Governorate (7, 8). However, no records are found for the disease in cats in Basrah governorate, therefore, the present work was **aimed** to study the clinical signs , hematological changes and diagnosis of hemoplasmosis in local cat breeds .

## MATERIALS AND METHODS

**Animals:** Twenty owned local cat breeds are used in this study

**Clinical examination:** Complete clinical examinations has been applies for all cats , Moreover, full case history of each animals were also registered. (9).

**Sampling:** Two milliliter of blood mixed with EDTA were drained from each animal by cephalic vein puncture used to determine Total erythrocyte count (TRBc), Hemoglobin concentration (Hb), packed cell volume (PCV), mean corpuscular volume (MCV), mean corpuscular hemoglobin concentration (MCHC), and total leukocytes count, (Hematology analyzer, Genex, USA), Furthermore differential leukocytes count were done according to (10, 11).

**Staining :** Stain blood smears by Giemsa ( Syrbiob- Syria ) as in (10).

**Statistical analysis:** It was done according to SPSS program version 15.0.

## RESULTS

Results show that out of 20 cases of cats, seven was found positive for *Hemoplasma* spp. by microscopic examination of Giemsa stained blood smears with an infection rate of 35%.

Diseased animals show different clinical manifestations which include; Pale mucous membranes (35%), dehydration (15%), emaciation (10%), loos of appetite (10%), weakness (10%) and icteric mucous membranes (5%) as in Table(1).

**Table (1) Clinical findings of hemoplasmosis in cats**

Clinical Signs	Infected cats n=7	Percentage
Pale mucous membranes	7	35%
Dehydration	3	15%
Emaciation	2	10%
Loos of appetite	2	10%
Weakness	2	10%
Icteric mucous membranes	1	5%
Cats appeared no clinical signs	13	65%
Total no. =20		

On the other hands , resulted was also indicated a significant increase ( $p<0.05$ ). in body temperture , respiratory and heart rate of infected cats than in non-infected cats (table-2).

**Table ( 2 ) : Body temperature, respiratory and heart rate of infected and non-infected cats**

Parameters	Non infected cats n=13	Hemoplasma infected cats n=7
Body temperature C °	39.2± 0.42	39.8± 1.23*
Respiratory rate/ mint	26.5 ± 1.51	44.4 ± 3.68*
Heart rate/ mint	115± 3.43	166.2 ± 2.44*

Values are mean ± standard error of mean \*( $P<0.05$ ).

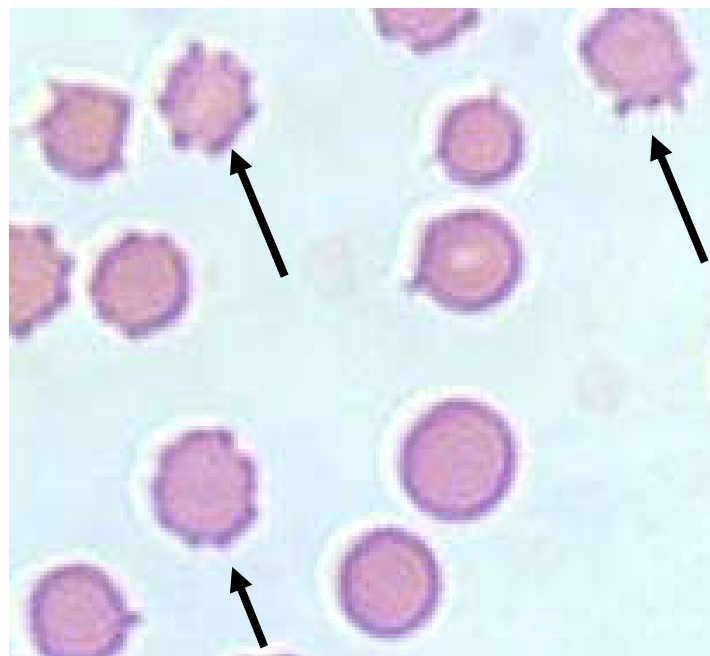
Results of hematological examinations explained in table(3), showed a significant ( $p<0.05$ ) decrease in total erythrocytes count, hemoglobin concentration, and packed cell volume reflected Normocytic Normochromic type of anemia comparing with non-infected cats. Moreover, leukocytosis was Indicated in infected cats compared with non-infected.

**Table (3) The Hematological changes of infected and non-infected cats**

Parameters- unit	Non infected cats N=13	Hemoplasma infected cats N= 7
Hb /g	12.03 ± 0.13	9.8 ± 0.39*
TRBC x10 <sup>6</sup>	8.29 ± 0.11	6.06 ± 0.25*
PCV %	36.06 ± 0.45	27.02 ± 0.91*
MCV fL	43.5 ± 0.76	44.58 ± 1.22
MCH pg	14.51 ± 0.25	15.17 ± 1.72
MCHC g/dL	33.36 ± 0.32	34.26 ± 1.09
TLC x10 <sup>3</sup>	10.8 ± 1.65	14.4 ± 0.96*

Values are mean and standard error \*(P<0.05) ( Hb: Hemoglobin concentration , TRBCs: Total erythrocyte count , PCV: Packed cell volume , MCV: Mean corpuscular volume, MCH: Mean corpuscular hemoglobin, MCHC: Mean corpuscular hemoglobin concentration, TLC: Total leucocytes count)

On microscopic examinations of Giemsa stained blood smears, appears *Hemoplasmas* spp as round or rod shape structures and located as a singular or in chains on the cell membranes of infected erythrocytes of diseased cats ( Figure- 1) .



**Figure (1):** *Hemoplasma* spp infect erythrocyte cell wall of cat(arrow) (Giemsa stain X1000).

## DISCUSSION

The Hemoplasmosis is an erythrocytic sickness and has been detected in cattle and sheep in Basrah (7, 8), what is more, hemoplasmosis will transmitted to most domesticated animals like cattle , Buffaloes ,sheep as well as dogs and cats and has greater clinical occurrence in those animals (1). However, latent *Hemoplasma* infection may additionally have an effect on mules, deer, elk and goats since the organisms largely seem species specific (12).

The hemoplasma examination in cats in Basrah city results that seven out of twenty 20 (35%) were found positive by using Giemsa stained blood smears, this results indicated, that the cats are a good host for *Hemoplasma* spp which might transmitted by invertebrate vectors like; lice, flies, ticks and mosquitoes (13). Furthermore, the organism could also transmitted directly through biting cats, since, hemoplasma present in their saliva, on gingival tissue and on claw bets of the infected cats (4).

Diseased cats showed different clinical manifestations most of these clinical findings mentioned are belong to the hemoplasma infection and were also indicated by others (1, 12 ,14). The presence of pale mucus membranes reflected anemia and reduction of blood parameters due to destruction and removal of parasitized erythrocytes by the reticulo-endothelial system (15), whereas icteric mucus membranes indicates the progressive hemolytic anemia and bilirubinemia, which developing in advance diseased animals (11).

Partial or complete loss of appetency may occur as Food intake regulation during inflammation is orchestrated by the brain in response to peripheral inflammatory signals. It is known that expression of the prostaglandin synthesizing enzyme cyclooxygenase 2 (COX-2) is crucial for the mechanisms underlying inflammation-induced anorexia, and that prostaglandin E2 (PGE2) is involved in anorexia induced by interleukin-1 beta (IL-1 $\beta$ ) (16, 17).

Weakness that had been shown on unhealthy cats may occur because of decrease muscle mass, presumptively related to the poor body condition associated with decrease conception rates following feline hemoplasmosis (15, 18).

Whereas the rise of body temperature associated with hemoplasma infected cats reflect the acute feature of the disease, and it connected to the liberation of endogenous pyrogens of the causative agents and because of cellular lysis stimulating thermoregulatory centers of neural structure within the brain(19).

Increased respiratory and heart rate might followed the systemic reactions which occurs because of the acute crises of the sickness and also the anemic pattern caused by the disease itself (18, 20), since rapid respiration affected unhealthy cats may occur as a result of anemic hypoxia as a result of decrease erythrocytes count and hemoglobin concentration which diminished the oxygen transmitted to several tissues of the body and then an adequate supply of oxygen will occur, which reflect an increase abdominal type of respiration of diseased cats (21).

The study revealed anemia in infected cat, which was exhibit normocytic erythrons which may related to hemolytic anemia following *Hemoplasma* spp infection (10), furthermore the defective erythrons be fragile and could be engulfed by spleen macrophage (11).

Examinations of blood smears stained with Giemsa, represent that the *Hemoplasmas* as round or rod form structures, however, it might be found on an individual basis or enchainned on the red blood cells (1). The variability in size of the organisms and their arrangement indicate that the organisms spread over the erythrocyte surface by a process of continuous budding or chain elongation (22).

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