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Research article

Serological study of toxoplasmosis in domestic pigeon *Colombia Livia* in Babylon province

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Abstract

The study was conducted to investigate the presence of Toxoplasmosis in domestic pigeon via Latex agglutination test (LAT). One hundred of blood samples were collected randomly from different areas in Babylon city during Five months started with July and ending at the latest November 2011. LAT20 was used for this purpose. (20%) out of samples have been taken showed positive results. Distributed throughout study Time in percentage of 18, 22, 20 and 21% during July, August, September, October and November respectively. With no significant difference among them (P>0.05).Observations showed that no pathognomonic clinical signs had appeared on the positive birds. While there was a clear, histopathological changes in infected birds compared with healthy ones. Macroscopic examination revealed congestion in liver and intestine with lymphocytes infiltration in peripheral vessels and hepatocytes necrosis of portal region and portal veins and sinusoid dilation.
Keywords: Babylon, Latex agglutination, Pigeon, *Toxoplasma gondii*.

Introduction

Toxoplasmosis is one of the common occurrence and widely spread zoonotic disease (1). The infection are high in poultry and in particular birds (2), which resulted from infection with *toxoplasma Gondii* that belong to coccidian (3) which have the ability to manifest both human and animal, while cats play a vital role to initiate the disease as a final host to the parasite which defecate the immature non-speculated oocytes over 10-21 days which speculate and acquire the ability to make the infection in 3-5 days and stay active depending on environmental conditions (4). The parasite needs two hosts to complete the life cycle which are the intermediate and final host (5). Currently the disease highly occur between pregnant women and animals leading to economic losses in million dollars in USA and Europe due to treatment costs and lose of fetuses (5, 6). The study aims to identify the presence of *toxoplasma gondii* in different areas of Babylon province via identification of morbidity rates using latex agglutination test then investigate histopathological changes related to positive results. The parasite is intracellular and spread both vertically and horizontally and infected free-range chicken are source of infection as they contaminate the surroundings with oocytes (7).

Materials and Methods

Ethical approval

The Animal Ethical Committee of Veterinary Medicine College, University of Al-Qadisiyah, Iraq was approved the present study.

Sampling

100 samples of blood were withdrawn by heart puncture from *Colombia livia* pigeon which collected from different parts of Babylon. The blood collected by sterilized disposable syringe in tubes and left in slant position to be clotted so that the serum going to be separated easily through high speed centrifuge 1500 rpm. Then the serum transferred to other sterile tubes and kept

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frozen at -20 until the day of experiment. At the day of Latex agglutination test experiment the serum were moved out from freezer and left at room temperature then 50uL were used from serum to be mixed with the reagent and left for 5 min to verify the reaction. Latex agglutination test positive samples showed a clear agglutination while negative samples did not agglutinate with the reagent. Other examinations which have been done include anatomy of positive birds to inspect gross changes of infection while visceral samples of liver, spleen and lungs were kept in formaldehyde to prepare slides and examination of microscopic changes of the disease.

Results

Results of testing 100 samples revealed presence of 20 pigeons positive to latex agglutination test giving that 20% morbidity rate of total as shown in table (1).

Table (1): numbers and percentage of Toxoplasmosis infection in pigeon according to latex agglutination tests and morbidity rates

%	Positive samples	Total samples	Month
18	4	22	July
18	3	16	august
22	4	18	September
20	5	25	October
21	4	19	November
20	20	100	total

Morbidity distributed over five months as 18,18,22,20,21 and 20% in July, August, September, October, November subsequently with no significant difference as detailed in table (1). Latex test were followed to identify the disease as a primary diagnostic tool and confirmation of the infection by microscopically and macroscopically examinations of infected birds which were shown a nonspecific clinical signs such as weakness and dullness at different severity between birds which refer to the silence nature of the disease as shown in Figure (1).

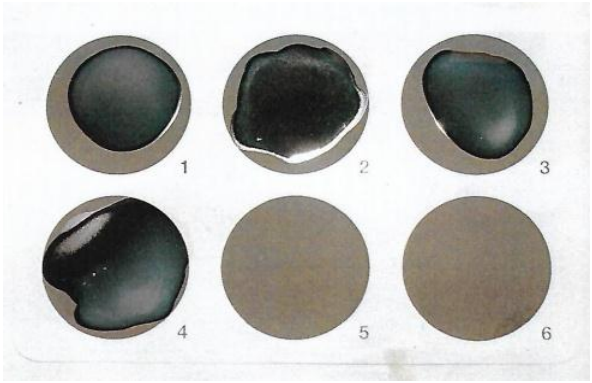

Figure (1): agglutination results with latex test

Post mortem examination revealed gross lesions in liver and spleen those are hepatomegaly and splenomegaly also congestion and necrosis of liver and congestion of intestine wall.

Figure (2): Congestion of liver and intestine of infected bird (latex+ve)

Figure (3): P.M. of healthy birds.

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Histological section were taken from healthy birds which gave negative latex also PM findings revealed no pathological changes to internal viscera as shown in figure (5), while there is an obvious dilations in sinusoids and vascular necrosis in liver cells in infected pigeons as in figure (4).

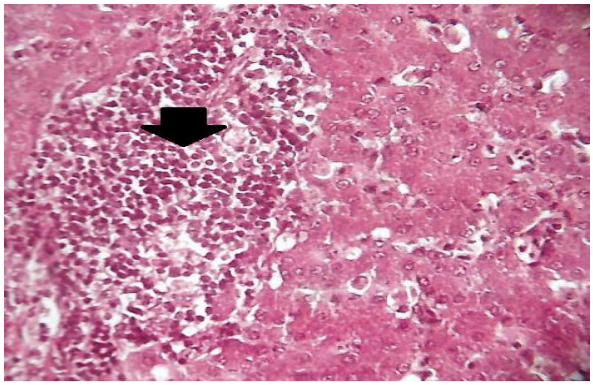

Figure (4): explain infiltration of inflammatory cells and dilations of sinusoids in infected liver.

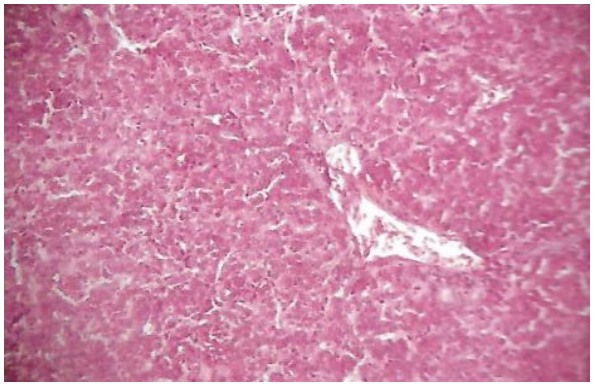

Figure (5): explain healthy liver with no dilation or inflammatory cells

Discussion

The study using latex test had proven the infection of toxoplasmosis in domestic pigeon in Babylon province at morbidity rate of 20%. It is clear that domestic pigeon infected with toxoplasmosis do not show prominent clinical signs, however, the post mortem examination revealed hepatomegaly and splenomegaly also congestion and necrosis of liver and congestion of intestine wall due to localization and replication of the parasite if compare with healthy birds which goes in line with (8). Congestion and hemorrhage of infected organs evidence of parasite ability to transit through blood and secrete of proteins materials (7 ،9 ،10). Histopathology examinations revealed infiltration of lymphocytes around the portal vein with necrosis in vessels area and semi-granular dilations of sinusoids in portal veins area which in agreement with (2, 11 , 12), histological section were taken from healthy birds which gave negative latex also PM findings revealed no pathological changes to internal viscera, while there is an obvious dilations in sinusoids and vascular necrosis in liver cells in infected pigeon. There may be interactions of parasites with mitochondria via effect on its function, which make the energy inadequate for sodium pumps, which leads to vacuolar necrosis, then decreased protein production and destruction of cellular walls and may cause inflammatory response and initiation of mediators such as interleukins and necrosis factor which attract inflammatory cells to the infected area (13, 15)

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