

Serodiagnosis of *Toxocara* in Human and Traditional Identification in cats at Baghdad City

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Abstract. The objective of this research was to look at the recorded of the intestinal helminthes *Toxocara* sp. in human and cats in Baghdad city since May 1st to September, 2022 and study the effect of age, gender and month on prevalence. The finding of human infection by *Toxocara* is highly dependent on serological tests, the specific of which able be insufficient in counties of widespread helminthiasis. A total of 96 sera samples from human were serologically tested using indirect ELISA IgG. Only 9% blood samples were positive. The existing study definitions showed that genders were infested with *Toxocara* in human. Regarding to the ages from <20 yrs and >29 yrs was negative, while from >30 yrs to >39 yrs was 6% and >40 yrs was 35% with greatly significant difference. According the gender, the percentage of contagion in male was 3.7% out of (53) sample, while in female was 16.2% out of (43) samples with highly significant difference ($P \leq 0.01$). In domestic and stray cats the total number of infection with *Toxocara cati* was 36% out of 100 fecal samples. According to the age in domestic cats the rate of infection in kitten was 20%, and in adult was 31% out of 35. While in stray cats was 42% recorded in kitten and 45% in adult cats. Finally, concerning to the months the highest infection rate recording August and September. In this search, ELISA IgG test was used to recognize *Toxocara* spp. amplified in the rate of infection analyses might be connected to the detection of remaining from prior infections.

Keywords: Prevalence, Zoonotic Parasites, *Toxocara cati*, ELISA, Cats

Introduction

Cats are very capable to a diversity of parasitic contaminations for of their habit of roaming freely (14). Pet animals as cats maybe performance as vector, transporter, reservoirs and final host for various intestinal parasite that communicate a disease to people (19). Toxocariasis remains a problematic during the world as it reasons zoonotic infection in the paratenic hosts like ruminants, persons, rabbits, poultry and rodent (10). Zoonotic parasites infection that is *Toxocara* spp. and geohelminths as *Ascaris lumbricoides*, *Trichuris* and hookworms are animal parasites that can infestation humans particularly by connection with contaminated environment (4). The zoonotic intestinal parasite *Toxocara cati* is a communal worm contaminating home cats as well as wild felids wide-reaching (26). Infectious larvae two have capacity to products *Toxocara* release proteins as (MUC-120) aid it to enter intestinal wall after that penetrate and travel to broadly numerous tissues counting lung and liver (9). Children's behaviors and their play with pets animals suggested to the high risk of infection, so the eggs of *Toxocara* spp. represent as a dangerous factor for human health (27). Complete secondary connection with animal excretions, infected water and food could be the transmitted of zoonotic agents (12). Many workers in Iraq used ELISA test as accurate technique for serodiagnosis of

large number of parasite in man and animals (28). Study the prevalence of *Giardia duodenalis* and detection IgM, IgG and IgA in some patients with Giardiasis (24). *Toxocara cati* was few reported in at Baghdad, Iraq and is little reported in human. The aims of present study to detect the *Toxocara* spp. In humans and to identified the prevalence of the parasite in cats.

Materials and Methods

Human Samples collection

Field study were passed out on 96 human blood samples from different regions in Baghdad city, throughout the period from May until September 2022. Blood testers were collected from human (55 males and 41 female) with different age groups. Disruption number of wells (2 for controls and more number of specimen) and plate in srtrip container. Incubation at area temperature (15-25C) at 10 minutes, then wash and enhance 100ul of enzyme conjugate to both wells. Protect at room temperatures for 5 minutes, then wash-down and complement 100ul of the chromogen to each well. Mixture well by gentry patter the lateral of the band holder with directory member for about 15 second.

Animals Samples Collection

In cats the total number of stool samples was one hundred were collected freshly after defecation from private veterinary clinic in Baghdad city, divided into (50 stray and 50 domestic cats). Samplers were practical in container clearly with a cover and the data relating to the ages, sexes and transference in clean container to the research laboratory of parasitology in Veterinary Medicine, Baghdad University for directly examination under the microscopic by direct and flotation (NaCl solution) traditional method procedure (11).

Statistical Analysis

The statistical analysis of the data of the experiment was measured by using the SAS (Statistical Analysis System -version 20.1). Using of two-way ANOVA and Least significant differences (LSD) post hoc test were performed to assess significant differences among means of the groups. The results were expressed as mean \pm

stander errors and $P < 0.05$ was considered statistically significant (3).

Results

A total number of 96 human blood samples registered infection rate with *Toxocara spp.* The total rate of infection was 9.37% in humans by indirect ELISA IgG. Regarding the age groups, was < 20 to 29 years did not recorded infection rate, while highest rate 35% (7\20) recorded by 40 years age groups with significant differences ($P \leq 0.01$) (Table 1). According the gender, the highest infection rate was 16.2% recorded in females while the infection rate was 3.7% in males (Table 2). In cats a significant differences ($P \leq 0.01$) between domestic and stray cats were recorded. The fecal sample collected and exanimated under the microscopic to detected eggs of *Toxocara cati* (Figure1). The highest infection rate was 45% recorded in adult stray cats, while the lowest infection rate was 3% in kitten domestic cats (Table 3). Finally, according the sexes, the highest infection rate was 46% in male stray cats (Table 4).

Table 1. Infection rate of *Toxocara* in human according to age group by indirect ELISA IgG.

Age	Examined No.	Positive No.	Percentage (%)
< 20yr	10	0	0.00
20yr-29yr	36	0	0.00
30yr-39yr	30	2	6.00
$\geq 40yr$	20	7	35.00
Total	96	9	9.375
Chi-Square (χ^2)	---	---	11.802 **

** ($P \leq 0.01$).

Table 2. Infection rate of *Toxocara* in Human according to genders by indirect ELISA IgG.

Gender	No. of examined samples	No. of positive Samples	Percentage (%)
Males	53	2	3.7
Females	43	7	16.2
Total	96	9	9.375
Chi-Square (χ^2)	---	----	7.155 **

** ($P \leq 0.01$).

Table 3. Infection rate with *Toxocara cati* in stray and domestic cats regarding to ages.

Ages	Stray cats			Domestic cats		
	No. of examined	Infection	%	No. of examined	Infection	%
Kittens	19	8	42	15	3	20
Adults	31	14	45	35	11	31
Total	50	22	44	50	14	28

Chi-Square (X²)	---			----		
7.155 **	** (P≤0.01).					

Table 4. Infection rate with *Toxocara cati* in stray and domestic cats regarding to Sexes.

Sexes	Stray cats			Domestic cats		
	No. of examined	Infection	%	No. of examined	Infection	%
Male	26	12	46	33	8	24
Female	24	10	41	17	6	35
Total	50	22	44	50	14	28
Chi-Square (X²)	---			----		
7.155 **	** (P≤0.01).					

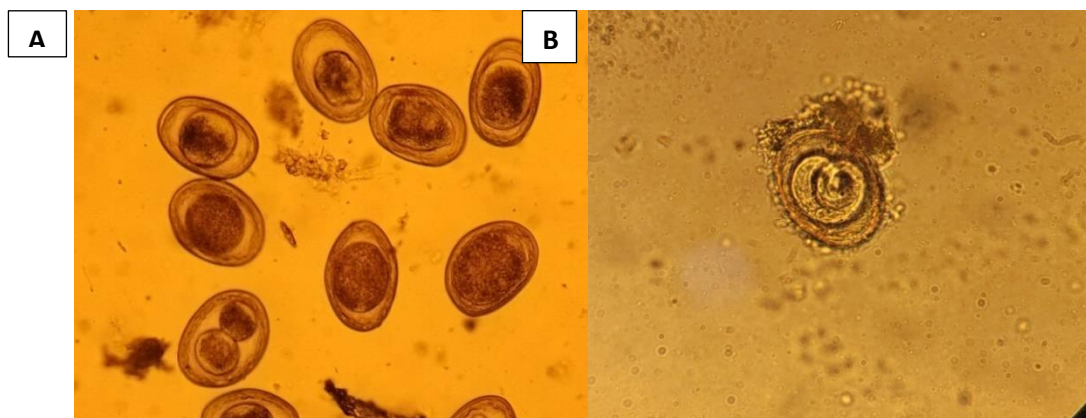


Figure 1. A. Undeveloped Eggs of *Toxocara cati* in cat 10x. B. Developed larva inside the eggs of *Toxocara cati* 10x.

Discussion

Toxocarosis is the scientific disease in human effect by contagion of zoonotic nematode of pets animals, cats can be possibly performance as a reservoir for dangerous contaminations to humans (6). These parasites are problematic to achieve as in certain cases they progress resistance to all existing saleable de-worm and fight to de-wormers is currently get global (8). Children additional often have clinical symptoms for of the nearer connection with polluted soil in plots and sandpits (20). Numerous paper in together nations found dissimilar results, Roldán experiential was 44.92%, with a noteworthy developed amount of positivity in male topics (21). Speiser and Gottstein an accord of serodiagnosis was found in 80% of 25 sera from infection people with *Toxocara* contagion (22). Jin was register positive diagnostic predictivity was 78.7% in human (13). Stensvold recorded seroprevalence of 2.4% toxocara infection in human. This study agreements with Al-Nasiri who recorded 8% in human (23, 16). In conclusion, human infection with toxocara spp. is greatly common in this people and various risk factors as pets ownership, incidence of cats or dogs inside

community, and prior history of geophagia were practical in the current research (16, 23). Conventional disease regulator plans have trusted mostly on chemoprophylaxis and Epidemiological report may be assistance to comprehend the hazard factors related with behavior difficulties. (1,25). In cats the study approximately with Martinez recorded *Toxocara cati* eggs in the faeces of 42.5% by flotation technique but this results low with Dantas were register 16.7% in Brazil and with Lukashev were recorded 52% in Russia (18,7,15). In Iraq, the results not compatible with Al-Aredhi were recorded 25.58% out of 90 fecal samples and consistent with Al-Rammahi were documented 34.75% out of 125 fecal samples (2, 5). Pet animals cats and dogs inhumed their feces in dust that may growth the prospect of propagation eggs of *Toxocara cati* and these eggs have capability to resistant environmental situations (2). This important community health danger to the people exist in the studying region. So, there is essential evidence on inhibition (17).

Conclusion

Indirect ELISA IgG technique was used to distinguish *Toxocara spp.* in humans about ages and gender is

amplified in the amount of infection examines was 9.37%. *Toxocara* sp. In Iraq, is limited reported *Toxocara spp* in human. ELISA as additional sensitive and correct technique for serodiagnosis be contingent on optical density which resembles to the antibody. In the cats recording great percentage infection was 36% in stray and domestic cats by traditional method exanimated.

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Conflict of interest

The authors' state that there is not conflict of notice.

Ethical consideration

Not applicable.

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