SEROPREVALENCE OF TOXOPLASMA GONDII INFECTION AMONG DOGS IN CENTRAL KERALA

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Toxoplasmosis caused by *Toxoplasma gondii* is a worldwide zoonosisthat causes infection in all warm-blooded mammals and birds. A total of 102 dogs presented at University Veterinary hospitals, Mannuthy and Kokkalai, with various illnesses during the period of one year from September 2015 to August 2016 were included in the study. The serum samples from these dogs were examined for antibodies to *T. Gondii* using ID Screen (Toxoplasmosis Indirect Multi-species kit). Out of the 102 serum samples tested 40 were positive for antibodies to *T.gondii* making a seroprevalence of 39.21per cent.The seropositivity titre among positive animals ranged from 69 to 333 per cent

Keywords: ELISA, Sero-prevalence, Toxoplasmosis.

Toxoplasmosis caused by *Toxoplasma gondii* is a worldwide zoonosis that causes infection in all warm blooded mammals and birds. Domestic as well as wild felids are the only definitive hosts for this protozoan parasite and they play animportant role in the epidemiology by shedding and excreting large number of infective oocysts in a short period of time in their faeces (Dubey and Prowell, 2013). Cats transmit *T. gondii* through environmental contamination by their faeces.Canine toxoplasmosis is also of epidemiological importance because its prevalence may reflect the magnitude of environmental contamination by the parasite. Dogs are considered as the sentinel animals for *T.gondii* infection because of their close contact with people (Salb *et al*., 2008). *Toxoplasma gondii* infections in dogs are important because it can cause serious illness. Dogs can be a transport host for *T. gondiioocysts* by acting as mechanical vectors because of their habit of eating cat feces and also rolling over the cat excreta Toxoplasmosis is also having zoonotic significance. *Toxoplasma gondii* is transmitted by ingestion of tissue cysts fromfood or water contaminated with oocysts, or ingestion of oocysts from the environment by accident

In Kerala toxoplasmosis has been reported among cats (Sudan *et al*., 2019; Latha and Swathi, 2018). There are no reports available on the prevalence of *Toxoplasma gondii* infection among dogs in Kerala. Hence this preliminary investigation was carried out to assess the seroprevalence of *T. gondii* infection among dogs in and around Thrissur District of Kerala.

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Materials and Methods

A total of 102 dogs presented at University Veterinary hospitals, Mannuthy and Kokkalai with various illnesses during the period of one year from September 2015 to August 2016 were included in the study.The serum samples from these dogs were examined for antibodies to *T.gondii* using ID Screen® Toxoplasmosis Indirect Multi-species kit All the serum samples (10µl) number of positive and negative control were diluted to 1:10 using 90 µlof dilution buffer supplied with the kit. The diluted test serum samples and positive and negative controls were transferred to an ELISA microplate coated with *P30* antigen of

T. gondii. The ELISA plate was incubated at 21ºC (± 5ºC) for 45 minutes.The wells were emptied and each well was washed three times with 300 µl of 1X wash solution using an ELISA plate washer.Hundred µlof 1X Conjugate were then added to each well. The plate was incubated at 21 ºC (±5 ºC) for 30 minutes.The wells were emptied and washing procedure was repeated as mentioned above.Hundred microliter of substrate solution was added to each well.The plate was then incubatedin the dark at 21 ºC (±5 ºC) for 15 minutes.Hundred microlitre of stop solution was added to each well in order to stop the reaction. Optical densities were measured at 450 nm using an ELISA plate reader (and Skan It Software 2.4.5 RE.The test was considered valid after it satisfied the following conditions; The mean value of the positive control Optical density ($O.D._{PC}$) was greater than 0.350 and the ratio of the mean O.D. values of the positive and negative controls is greater than three ($O.D._{PC}$/ $O.D._{NC}$> 3).For each sample, the seropositivity (S/P) percentage was calculated as follows:S/P per cent = ($O.D._{sample}$- $O.D._{NC}$ / $O.D._{PC}$ - $O.D._{NC}$)x 100.The result was considered as negative when S/P % ≤ 40 %, Doubtful when40 % < S/P < 50 % and positive when S/P % ≥ 50%.

Results and Discussion

Out of the 102 serum samples tested 40 were positive for antibodies to *T. gondii* making a seroprevalence of 39.21 per cent. The seropositivity titre among positive animals ranged from 69 to 333 per cent. The number of seropositive dogs in various age groups, breeds and sex are depicted in (Table-1). The age of seropositive dogs ranged from seven months to twelve years. Higher prevalence was observed among dogs of age group above five years followed by two to three years of age. The least prevalence was observed in young dogs below one year, similar findings of higher prevalence were reported among older animals by Wu *et al*., (2011), which they have attributed to the increased opportunity for older dogs to come in to contact with felines and thereby chance for ingestion of oocysts. Toxoplasma antibodies were detected from various breeds of dogs with highest number of seropositives in Labrador retrievers followed by Rotweillers, and Nondescript dogs. No difference was noticed in the number of seropositive animals among both sexes as Wu *et al*., (2011), also suggested that gender of the host was not a crucial factor for *T. gondii* infection.None of the characteristics studied including age, sexand breed was found to be associated with seroprevalence of *T. gondii* infection as also mentioned by Esquivel *et al*., (2014).

Higher seroprevalence of *T.gondii* in dogs indicates high level of environmental contamination in the study area.Results showed the public health significance including risk factor for infection in humans.The results of the present study necessitates the need for implementation of effective surveillance and monitoring system for the detection of toxoplasmosis and being a zoonosis, a one health approach is essential for control of the disease.However, further detailed studies are warranted to establishthe sources of environmental contaminationwith *T.gondii* and to determine the strategic control measures.

Table:Seroprevalence of Toxoplasmosis in different Age groups and Sex

Sl.No.	Age Groups	Number tested	Number positive	Per cent Positive (%)
1	0-1 year	19	4	21.05
2	1-2 years	18	6	33.33
3	2-3 years	15	8	53.33
4	3-4 years	15	5	33.33
5	4-5 years	11	3	27.27

6	Above 5 years	24	14	58.33
	Sex Groups			
1	Male	61	24	39.34
2	Female	41	16	39.02

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