Modified Direct Agglutination and Latex Agglutination Tests for the Diagnosis of Toxoplasmosis in Canines*

M. Vijaya Bharathi', V. Purusothaman, P.I. Ganesan, B. Murali Manohar and N.R. Senthil
Department of Veterinary Epidemiology and Preventive Medicine, Madras Veterinary College, Vepery, Chennai 600007.

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Toxoplasmosis, a widespread emerging zoonotic disease, is caused by Toxoplasma gondii, an obligate intracellular coccidian parasite, affecting a wide range of animals including man. Domestic cats are the major source of contamination as they are common reservoirs of infection and excrete large numbers of oocysts. The clinical signs of canine toxoplasmosis are characterized by pneumonia, respiratory distress, diarrhea, ataxia, limited joint mobility, lymphadenopathy, ascites, emaciation, abortion, stillbirth, blindness chorioretinitis, uveitis, etc (Ahmed et al., 1983). Seroprevalence of T. gondii antibodies in the domestic dogs has been detected around the world using various diagnostic tests, MDAT, IFAT, IHAT, ELISA and LAT. The objective of the present study was to compare the efficacy of Modified Direct Agglutination Test (MDAT) and Latex agglutination test for the detection of Toxoplasma antibodies in naturally exposed dogs.

Materials and Methods

Blood samples in 2 ml quantity, from 400 dogs were collected aseptically from in and around Chennai. Blood was allowed to clot and centrifuged at 2500 rpm. The serum samples were stored in sterile 2 ml storage vials at -20°C until further use.

Reference positive and negative control sera were provided by Dr David Buxton, Moredun Research Institute, International Research Centre, U.K. Modified direct agglutination test reference antigens were supplied by Department of Parasitology, Postgraduate Institute of Medical Education and Research, Chandigarh. Mouse adapted RH strain of Toxoplasma gondii was obtained from Department of Veterinary Parasitology, Veterinary College, Tirupathi. The modified direct agglutination test antigen was prepared. Modified direct agglutination test was done as per the procedure described by Desmonts and Remington (1980). Double fold dilutions of serum samples from 1:2 to 1:4,096 were tested. To avoid interpreting non-specific reactions as positive results, only titres of 1:64 or high were considered as positive for MDAT.

Latex agglutination test was performed using PASTOREX TOXO latex agglutination kit, manufactured by Sanofi Diagnostics Pasteur, France as per their recommendations.

Results and Discussion

Of the 400 dog sera samples screened for the presence of antibodies against T. gondii, 117 (29.25 %) were positive by MDAT. MDAT titre of T. gondii antibodies for each serum sample was assessed and the titre ranged from 1 in 64 to 1 in 4096. Out of the 117 positive samples, 37(31.62 %) had a titre of 1 in 64, 17(14.52 %) 1

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Corresponding author: Email : mvijayabharathi74@gmail.com

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in 128, 24(20.51 %) 1 in 256, 23(19.65 %) 1 in 512, 9 (7.69%) 1 in 1024, 5(4.27 %) 1 in 2048 and 2 (1.70%) 1 in 4096. With LAT overall seropositivity was found to be 93/400 (23.25%).

The results of the present study revealed that MDAT detected more number of seropositive animals (29.25%) compared to LAT (23.25 %). Dubey et al. (1991 & 1995) observed that MDAT was more sensitive than LAT. The sensitivity and specificity of LAT in the detection of antibodies to T. gondii were compared with MDAT. The agreement between two tests was assessed by Kappa value and exhibited perfect agreement (Kappa Value = 0.84). The sensitivity of the LAT was found to be 79.48 per cent. The 20.5 per cent (24/117) of dogs that were not detected were referred to as false negative. All these 24 samples had MDAT titre of 1:64. This suggested that the LAT procedure had a lower limit of sensitivity of 1:64 as measured by MDAT. The specificity of the LAT was 100 per cent with no false positive results.

Dubey et al. (1985) reported that modified agglutination test was almost as sensitive to dye test for toxoplasmosis. Vijaya Bharathi et al. (loc. cit) and Dubey et al. (1985) observed that modified agglutination test was the most sensitive test compared to indirect haemagglutination and latex agglutination tests in the diagnosis of Toxoplasma gondii.

References


