



Original Article

Anaplasmosis seroprevalence in stray dogs from Sofia, Bulgaria

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ABSTRACT

Anaplasmosis is a vector-borne zoonotic infection which affects different domestic and wild species. The data for the distribution of the disease in stray dogs from different parts of Bulgaria is fragmentary. The purpose of the study is to introduce the results of the serological examination of 293 stray dogs from western Bulgaria (Sofia region). Thirty-seven of them (12.63%) were positive for specific antibodies determined through rapid chromatographic immunoassay. Based on the current results we can conclude that canine Anaplasmosis is endemic in the area of Sofia, Bulgaria.

Keywords: *Anaplasma phagocytophilum*, seroprevalence, stray dogs, Bulgaria

INTRODUCTION

Anaplasmosis is a widespread tick-borne infection which affects wild and domestic canidae. *Anaplasma phagocytophilum* and *Anaplasma platys*, the causative agents of the disease, are obligate intracellular bacteria. Tick-transmission is the predominant means of infection and *Ixodes ricinus* is the main vector in Europe (Rizzoli *et al.*, 2014). Clinical signs are fever, lethargy, anorexia and many of the affected animals remain asymptomatic as indicated by the high number of healthy seropositive dogs relative to dogs with the clinical disease (Kohn *et al.*, 2008). The most commonly used assays for detection of anti-*Anaplasma* antibodies are rapid tests, based on ELISA and immunochromatography which are with high sensitivity and specificity (Stilmann *et al.*, 2014).

Nowadays there is a continuously increasing data for the infection epidemiology in canine population in different parts of Bulgaria. However, the knowledge about the distribution of the disease in stray dogs is still fragmentary. Stray dog populations should be considered one of the major reservoirs of infection worldwide (Güven *et al.*, 2017; Koh *et al.*, 2016; Yousefi *et al.*, 2019).

Anaplasma spp. has a zoonotic potential (Rymaszewska and Grenda, 2008) and the data about seroepidemiology in animals can contribute the assessment of the risk for the human population.

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Positive serological assays can be used as an epidemiological indicator but at the same time in endemic areas antibody titer may be a result of previous infection and may not be indicative of acute infection (ESCCAP Guideline, 2019).

The aim of this study was to determine the seroprevalence to *Anaplasma spp.* among clinically healthy stray dogs from Sofia region and to perform comparison with the available epidemiological data from Sofia region and different parts of Bulgaria.

MATERIALS AND METHODS

Study area and animals -The survey was carried out in Sofia region (west part of Bulgaria) and included 293 apparently healthy and randomly selected stray dogs from different parts of the city and neighbored metropolitan areas. All animals were mix breed, from both sex (male – n=158, female – n=135), the age of all dogs ranged from app. 1 to 15 years. There was no information about prophylactic measures against parasites.

Clinical materials – Blood samples were collected from *v. saphena lateralis* or *v. cephalica antebrachii* through standard technique in tubes with EDTA. The immunological test was performed *ex tempore*.

Immunodiagnostic assay – The used assay was *Anigen Rapid CaniV-4Test Kit* (BioNote Inc., South Korea) – a chromatographic immunoassay which includes the qualitative detection of antibodies against *Anaplasma spp.* The test was performed with whole blood and according to the manufacturer's instructions.

RESULTS AND DISCUSSION

The samples from 37 dogs were positive for specific antibodies against *Anaplasma spp.* The seroprevalence was 12.63 %. Twenty of the positive were male (n=20) and 17 (n=17) female. The received results should be interpreted in comparison to similar studies from the same and neighboring regions.

Although the first Anaplasmosis case in Bulgaria was documented more than decade ago (Tsachev *et al.*, 2008), there is available seroepidemiological data only for some regions of the country. The study of Tsachev (2009) showed positive samples only in southern regions (3.5 % in Plovdiv, n=57 and 17.4 % in Stara Zagora, n=29) but not in northern Bulgaria and Sofia (Tsachev 2009). Anyway the number of samples from Sofia in this study was quite limited (n=6). Another epidemiological research from Stara Zagora (South Bulgaria) included only pet animals (n=167) detected specific anti-*Anaplasma spp.* antibodies in 41.6% (Pantchev *et al.*, 2015). Recent study among pet dogs from Sofia (n=160) determined seroprevalence of 8.75% in this canine population (Borisov *et al.*, 2017). The only one published survey for stray dogs from Bulgaria (Sofia region) for 2017 shows seroprevalence of 18.87 % (n=159) (personal date). The comparison of seropositivity in pet and stray dogs showed a wider distribution in the second. The lower incidence in pet dogs could be connected with the better prophylactic measures against ectoparasites. The available date showed wider Anaplasmosis incidence in southern than in northern part of Bulgaria.

The results from seroepidemiology for Anaplasmosis in canine stray population from Sofia in 2018 confirmed the observation that the area is stably endemic for the infection.

CONCLUSIONS

Based on the current results we can conclude that canine Anaplasmosis is endemic in the area of Sofia, Bulgaria. Because of the potentially substantial role of stray dog population in urban areas in Anaplasmosis epidemiology further serological monitoring can contribute for a more comprehensive understanding and approach to the disease.

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