

A Cross Sectional Survey of Zoonotic Diseases in Stray Dogs of Kerala, a Southern State of India

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Abstract: Stray dogs are common reservoirs of zoonotic pathogens. The study investigated the incidence and distribution of common zoonotic diseases among stray dogs of Kerala, a southern state of India. A total of 124 stray dogs were screened for five transmissible diseases. The study revealed an apparent incidence rate of 4% (Leptospirosis), 7% (Leishmaniasis), 0.8% (Canine Brucellosis), 24.1% (Dirofilariasis), and 33.3% (Canine Distemper) among free roaming street dogs. The results showed that stray dogs constitute potential risk to human health by maintaining zoonotic pathogens. The findings suggest the need for enforcement of laws restraining straying dogs and calls for greater public awareness on the problem.

Keywords: Zoonotic pathogens, Leptospirosis, Leishmaniasis, Canine Brucellosis, Canine Distemper, Dirofilariasis.

INTRODUCTION

Stray and free roaming dogs are usually poor cared for and are often carries of diseases [1]. Many of these are zoonotic. Some of these diseases such as Rabies and Leptospirosis are well known, however others are not so commonly recognized. Stray dog population suffers from zoonosis more often than pet dogs due to their lifestyle and absence of immuno prophylaxis. There are few published reports on prevalence of communicable diseases among stray dogs. The aim of the present study was to provide baseline data on the prevalence of communicable diseases among stray dogs in India, a country with highest number of free roaming dog population in the globe.

MATERIALS AND METHODS

A prospective cross sectional study was designed that consisted of random sampling of stray dogs captured for government sponsored animal birth control (ABC) program, abandoned dogs captured from street and housed in a shelter home of an NGO and stray dogs kept in the impatient ward of city government veterinary hospital. A total of 124 stray dogs were sampled which included 51 males and 73 females, animals of different ages and 13 geographical locations of the city. Sample size constituted 0.6% of the stray dog population in the city and was statistically significant at 95% confidence interval.

Incidence of five diseases was assessed using conventional and immunological methods. Diseases screened were Leptospirosis, Canine Brucellosis, Leishmaniasis, Canine Distemper and Dirofilariasis. For serological antibody screening, ELISA was used. Canine Distemper was screened using antigen detection immune chromatographic rapid screening test and Dirofilariasis by wet blood film examination and antigen detection immune chromatography.

RESULTS

Seroincidences of various diseases were: 24.1% (30/124) for Dirofilariasis, 0.8% (1/124) for Canine Brucellosis, 33.3% (8/24) canine distemper, 4% (5/124) Leptospirosis and 7% (7/100) Leishmaniasis. Certain geographical areas (5/13) recorded >50% incidence level for microfilariasis. All *Leptospira* seropositive dogs belonged to one location suggesting the area being endemic for the disease. Clinically these animals were unaffected. Though high rate of microfilariasis was detected in the study, none were positive in the specific antigen test of *Dirofilaria immitis*. No specific geographical prevalence could be observed for the other diseases included in the study. No apparent sex or age prevalence could be detected.

DISCUSSION

Public health concerns over stray dogs are mostly related to zoonotic disease transmission as they are considered the main reservoirs. India has 19.2 million stray dogs [2] and their population is rising owing to a lack of stringent population control. Reports on stray dog disease status are limited as veterinary

clinics do not get street dogs to examine or treat. The present study revealed the presence of common zoonotic pathogens in stray dogs pointing towards the possible reservoir role played by them in endemic areas. Diseases investigated in the study were endemic in the country.

Dirofilariasis

High incidence of Dirofilariasis, an emerging zoonosis in India [3], was detected. However specific test for *D.immitis* were negative. *D. repens* was reported as the more prevalent species in southern region of the country (1) and could be the species reflected in the study. Species identification of microfilaria is difficult without molecular diagnostics and hence species-specific estimate may not be accurate.

Canine distemper

Canine distemper was another disease found at high rate in the study. Though they are host specific and pose little zoonotic risk, the disease has potential to wipe out canine population. Its relationship with human health has been inadequately explored [4]. Hence findings are relevant in the epidemiology and transmission ecology of the disease.

Leishmaniasis

In India, Leishmaniasis is mainly considered anthroponotic and endemic in northern part of the country (1). 7% apparent prevalence observed in the study suggest a possible movement of the disease to naive areas. Stray dogs provide good habitat for sand flies, the vector. Further studies are necessary to elucidate actual role played by stray dogs in the epidemiology of Leishmaniasis.

Leptospirosis

Role played by stray dogs in the transmission of Leptospirosis are well known and the study findings are in accordance [5]. Asymptomatic dogs can be carriers and source of infection to vectors (rodents) due to their precarious physical condition and outdoor living habits and make Leptospirosis control more difficult.

Canine Brucellosis

Finally, 0.8% of the dogs included in the study were found to possess antibodies to *Brucella canis*, a species pathogenic to human also. Though documented reports of human brucellosis in the country caused by *B.canis* are scanty, the finding has implications in public health highlighting the inadequacy of surveillance and reporting.

CONCLUSION

In conclusion, this study provided baseline information on the prevalence of common zoonotic pathogens among stray dogs and data are of interest because stray dogs could be sentinels for disease surveillance in endemic areas. From public health view

point, ubiquity of zoonotic diseases in dogs in India warrants appropriate surveillance program in combination with population control and increased general public awareness.

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