J Vet Clin Vol. 23, No. 2(Suppl.) November (2006)

Seroprevalence and Molecular Detection of Canine Ehrlichiosis in Outdoor German Shepherd Dogs(GSDs) in South Korea

Sang-Ho Seo, Woo-Sung Jung, Kyoung-won Seo, Cheol-Yong Hwang*, Hwa-Young Youn

Department of Veterinary Internal Medicine, College of Veterinary Medicine, Seoul National University

Introduction: Ehrlichia species are intracellular gram-negative bacteria that parasitize monocytes, granulocytes or platelets and are responsible for various vector-borne diseases in animals as well as human in different parts of the world. The clinical and clinical pathological presentation of the disease may vary. The signs most frequently reported are depression, lethargy, anorexia, fever and thrombocytopenia. This has been shown to exhibit worldwide geographical distribution; however, there have been no broad survey reports in dogs of South Korea. The purpose of this study was to survey the prevalence of canine ehrlichiosis and identify the molecular DNA fragments of Ehrlichia spp. by PCR, sequencing and phylogenetic analysis.

Materials and Methods: A total of 291 dogs were randomly selected from different provinces of Korea between October 2005 and September 2006. 291 samples of canine blood were taken for serological screening test and PCR analysis from German shepherd dogs(GSDs) admitted to Annual Training Program in Gyeonggi and Gangwon province.

The Snap® 3Dx assay(ELISA method, IDEXX Laboratories Inc., USA) was performed according to the manufacturer's recommendations and the sensitivity of this kit is known as 98.9% and the specificity 98.2%. The PCR analysis and sequencing were conducted to detect and differentiate Ehrlichia spp. named E. canis, E. chaffeensis, E. ewingii.

Results: The prevalence of canine ehrlichiosis by the Snap® 3Dx test kit was 7.56%(22/291) throughout the country. The results of nested PCR were negative for E. canis and E. ewingii. Nine DNA samples showed positive results for E. chaffeensis. The sequencing results correlated with the nested PCR results. The age distribution ranged from 4 to 8 years old and no significant difference was found in prevalence between female and male dogs. The regional distribution of seroprevalence showed 1.28%(1/78) in Gyeonggi, 12.64%(11/87) in Gangwon, 9.76%(4/41) in Chungchong, 8.93%(5/56) in Gyeongsang and 3.45%(1/29) in Jeolla province, respectively. Among 22 positive sera, the highest prevalence was observed in the eight-year-old dog and in Gangwon province. Target DNAs were amplified from 9 (3.09%) of 291 samples by PCR analysis. PCR positive samples were 31.82%(7/22) among 22 seropositive samples.

Clinical relevance: This report suggests that E. chaffeensis infection should be present in dogs of South Korea. Therefore, the regular extensive monitoring and appropriate treatment should be continuously implemented for the control of this ehrlichial disease in view of zoonosis control.

* Corresponding author : cyhwang@snu.ac.kr