

## **Identification of Variants of Canine Parvovirus and Analysis of Risk Factors in Parvoviral Enteritis among Vaccinated Dogs**

**B. G. S. S. Gamage<sup>1</sup>, I. D. Silva<sup>1</sup>, D. V. P. Prasada<sup>2</sup>, D. R. A. Dissanayake<sup>1\*</sup>**

<sup>1</sup>*Department of Veterinary Clinical Sciences, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Peradeniya 20400, Sri Lanka*

<sup>2</sup>*Department of Agricultural Economics and Business Management, Faculty of Agriculture, University of Peradeniya, Peradeniya 20400, Sri Lanka*

*\*drad199@gmail.com*

Canine parvovirus type-2 (CPV-2) and its variants (CPV-2a, CPV-2b and CPV-2c) cause haemorrhagic gastroenteritis in dogs. Despite vaccination, severe outbreaks of CPV infections occur in Sri Lanka. We analysed the risk factors, prognostic indicators and variants of the virus infecting vaccinated dogs. Signalment, vaccination history, vital parameters, and clinical findings of the patients enrolled in the study were recorded. Total DNA from faecal samples was extracted and the gene (partial) encoding the major capsid protein (VP2) was amplified. Twenty PCR amplicons from vaccinated dogs were sequenced to identify variants. Multivariate factor analysis was performed to determine the impact of risk factors; namely breed, age, vaccination status, and prognostic indicators (leucocyte counts and vital parameters) on different days of diarrhoea; on disease severity and survival. A total of 109 samples were positive for parvoviral DNA, 71 of which were from vaccinated dogs. Over 90% were leucopenic during disease progression, particularly on the second and third days of diarrhoea. The leucocyte count was negatively correlated with survival, though not statistically significant. Age below six months showed a negative correlation with the leucocyte count while other factors such as breed and vaccination status had no effect on it. The mortality rate in the patients was 19.2%. Doberman Pincher and Labrador Retriever breeds showed a significant negative correlation with survival. All three variants of parvovirus appeared to affect vaccinated dogs. However, the variant 2c was predominant (2c=12, 2a=7, 2b=1). All 20 strains harboured three additional amino acid substitutions, (Phe267Tyr, Ser297Ala and Tyr324Ile) which may have helped the virus to evade immunity. New CPV-2 variants could cause severe clinical disease even in vaccinated dogs and dogs below the age of six months were at high risk. The leucocyte count on day 2-3 of the disease is a good prognostic indicator of CPV infection.

**Key words:** Parvo, Canine, Variants, Risk factors, Leucocyte

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