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Research Paper

## DETECTION OF CANINE PARVOVIRUS BY LATERAL FLOW ASSAY IN ORGANIZED VETERINARY HOSPITAL

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Parvoviral gastroenteritis affects young pups with severe bloody diarrhoea, vomition leading to dehydration. If left untreated, it will lead to death of puppy. So field level test is necessary for diagnosis. To diagnose at field level, cheap and easy method of identification is Lateral flow assay. Samples including faecal (48), blood (13), tissue (4) were collected from 65 dogs of different age groups suspected for having parvoviral gastroenteritis presented to Veterinary college hospital, Bengaluru. Of the 65 samples, 20 (31%) were found positive by lateral flow assay, of which nine were from vaccinated dogs and eleven were from unvaccinated dogs. Lateral flow assay can be used as field test even by the pet owners and it is simple test.

Keywords: Lateral flow assay, Parvoviral gastroenteritis

### INTRODUCTION

Parvoviral gastroenteritis is a highly contagious viral disease which causes severe acute haemorrhagic enteritis and myocarditis in puppies over the age of 3-4 months. The disease is spread from dog to dog mainly through exposure to contaminated faeces. It is also spread through contact with fomites (contaminated objects). Common fomites include hands, instruments, clothing, food and water dishes, toys and bedding. The disease is caused by Canine parvovirus-2 (CPV-2). The virus can remain on a dog's hair

coat (even if they do not become ill) and serve as a means of transmission long after dogs have recovered from clinical disease. There will be watery, yellow in colour tinged with frank blood. Faeces can vary from simply soft in mild cases to grossly hemorrhagic in severe cases. Death ensues due to dehydration, leading to the peripheral circulatory failure. Parvovirus myocarditis is a condition of young dogs and primarily a litter problem. Within an infected litter, 70% pups will die due to heart failure by 8 weeks of age and the remaining 30% will have

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pathological changes which may result in death in a few months or even years later. The characteristic manifestations of myocarditis is the sudden death in young pups usually about 4 weeks of age, the collapsed dying pup may have cold extremities, pale mucosa and show terminal convulsions (Nandi *et al.*, 2013). The original CPV-2 virus which emerged in the late 1970s was rapidly replaced by two antigenic variants, CPV-2a in 1979 and CPV-2b in 1984. Further in 2000, a third, CPV-2c, was first detected in Italy and found to be progressively replacing other variants in many countries of the European Union, South America, North America and Asia but Australia has been declared free of CPV-2c. Subsequently new CPV-2a, new CPV-2b have emerged in the canine population (Nandi *et al.*, 2013).

Even though, several diagnostic approaches like isolation, enzyme-linked immunosorbent assay (ELISA), Polymerase Chain Reaction (PCR) assay were available, All these tests are laboratory-based, requires technical skill, refrigeration, specific equipment. Thus, availability of simple, reliable, cost-effective and field-based diagnostic tool without any requirement of technical skill, refrigeration, and equipment helps to diagnose is necessary. This strikingly demands development of a Lateral Flow Assay (LFA), a field-based diagnostic tool for easy detection of infection and to prevent disease transmission and outbreak events and it can be easily performed by pet owners, Breeders.

## MATERIALS AND METHODS

### Collection of Samples and Tests

A total of 65 samples from dogs were collected, of which 48 were faecal sample, 13 were blood samples, and 4 were tissue samples from different breeds and age group of animals

presented to Veterinary College Hospital, Hebbal, Bengaluru. Faecal samples and tissue samples were diluted in 1 ml sterile PBS and immediately shifted to the laboratory under cold chain and stored at 4 °C for further processing. Blood samples were collected in EDTA containers and stored at 4 °C for further processing

### Lateral Flow Assay Kits

Lateral flow assay kits were procured from M/s Ubio Biotechnology Systems Pvt. Ltd. Cochin, Kerala, India. The importance of Parvoviral infections is important as it is very fatal disease of puppies and lack of simple, reliable, and cost-effective field-based diagnostic tool for early investigation of infection. The samples collected in assay diluents were left for 10 min for the settlement of larger particles to the bottom. 70 micro liter of supernatant was added into the sample hole. The purple colour was observed to move across the result window in the centre of the test device. The results were interpreted within 10 min. Control band (C) was located in the left section of the result window. The appearance of a colour band was suggestive of proper working of the test. The right section of the result window indicated the test results (T). The development of colour band in the right section was taken as positive.

## RESULTS AND DISCUSSION

Of 65 samples screened by two tests, 20 (30.7%) were positive by LFA and PCR, respectively. Of 20 samples LFA positive, 14, three and three were positive in faecal, blood and tissue respectively. Of the 65 samples, twenty samples were positive (31%) by LFA, of which 14 were faecal samples, three each of blood and tissue samples. Out of twenty LFA positive samples, nine were from vaccinated and eleven were from unvaccinated

cases. These findings were in agreement with Mallikarjun *et al.* (2013) who also used Ubio Quick VET antigen Rapid test kit for the detection of CPV antigen and reported 54% positivity and Tinky *et al.* (2015) used immuno chromatographic test or LFA for CPV antigen detection and reported 36% positivity for CPV infection.

## CONCLUSION

Lateral flow assay can be recommended as a rapid field level diagnostic tool for the diagnosis of Parvoviral gastroenteritis infections in dogs. 🌀

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