



FIRST REPORT OF CANINE DISTEMPER VIRUS INFECTION UNDER CAPTIVITY IN A ROYAL BENGAL TIGER (*PANTHERA TIGRIS TIGRIS*) IN MADHYA PRADESH

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ABSTRACT: Present study reports a case of canine distemper virus (CDV) infection in a Royal Bengal tiger (*Panthera tigris tigris*) in a zoological park cum rescue facility that led to the death of animal. We performed pathological and molecular investigations of CDV infection in the tissue samples of dead felid. Nucleoprotein (NP) gene sequence of CDV retrieved from the present case was similar to the strains circulating in the wild carnivores. CDV lesions were primarily interstitial pneumonia and interstitial nephritis. Formalin-fixed paraffin-embedded (FFPE) tissue fragments of the lungs, heart, liver, spleen, kidney and urinary bladder were also subjected to immunohistochemistry assay designed to detect antigens of CDV in cellular structures which revealed positive reaction for the presence of CDV antigens either diffusely or multifocal brown stained intranuclear and/or intracytoplasmic components of cells. Our findings highlight the need for further understanding of CDV epidemiology in captive endangered carnivores.

Keywords: Captivity, CDV, monoclonal antibody, NP gene, tiger

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INTRODUCTION

Canine distemper virus (CDV) is a *Morbillivirus* of the family *Paramyxoviridae* which has emerged as a significant pathogen affecting wide range of carnivore species and now recognized as a global multi-host pathogen (Deem *et al.*, 2000). Reports of CDV outbreaks in big cats such as tigers (*Panthera tigris*), lions (*Panthera leo*) and leopards (*Panthera pardus*) have challenged the belief that the felidae group of animals is resistant to CDV infection (Gilbert *et al.*, 2015).

Canine distemper is a common polysystemic disease that may infect the respiratory system, gastrointestinal system followed by central nervous system. Signs range from anorexia to non-responsiveness to stimuli, blindness, absent fear for humans, head pressing, ataxia, and intermittent petit and grand mal seizures in big cats (Seimon *et al.*, 2013). In free-ranging big cats, source of infection may range from feral dogs to other several other wild

carnivores such as jackals, foxes, hyaena etc. However, CDV infection has also been reported in captive big cats and source of infection is always variable including newly introduced species, zoo invaders reservoirs or through fomites such as clothes of zookeeper which might have infected dog at home (Konjevic *et al.*, 2011). Severity of disease can be fatal in captive animals depending on the immune status. It has been observed that animals may not show clinical signs of CDV, however with secondary infection and poor immunity status, it can result into death of affected animal. It is also a matter of concern in captive population where animals are displayed in close proximity which may lead to outbreak in captive facility. Hence, timely diagnosis and management is the key to prevent the outbreak of infectious diseases in captive animals. Here, we describe the pathology and molecular investigations of a CDV infection in an adult Royal Bengal tiger (*Panthera tigris tigris*) which has been reported for the first time under captivity in the State of Madhya Pradesh.