
CANINE DISTEMPER OUTBREAK IN PALM CIVETS AND ITS IMPLICATIONS IN ANIMAL HEALTH

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ABSTRACT

A fatal disease outbreak occurred in palm civets in Thiruvananthapuram district of Kerala, a southern state of India. The disease killed about twenty animals in three localities of the district. Clinical signs were unnoticed and reported as “found dead” in field. Samples collected during post mortem were positive for canine distemper virus antigen using CDV antigen test kit. Consistently observed lesions consisted of severe pneumonia, meningitis, encephalitis and gastroenteritis. Bacteriological culture and antigen detection tests for other infections such as rabies, canine and feline corona infection and parvo viral enteritis were negative. Though not a zoonotic pathogen, the disease has got animal health implications. Being a fatal and highly contagious disease, CDV could threaten their life and endanger the species and also pose a serious threat to the health of pets, stray dogs, zoo animals and wild animals facing species endangerment in the areas they inhabit. The potential of cross-species

disease transmission between wildlife and domestic animals is discussed.

Key words: Palm Civet, CDV, Canine Distemper, Epidemic

INTRODUCTION

Asian palm civet (*Paradoxurus hermaphrodites*) commonly known as Toddy cat of family Viverridae, is a native of India and distributed across Asia. They are commonly exploited for human consumption and hunted for fur, meat or scent in many parts of the world. They have been known as a nocturnal creature living a solitary life and inhabit in dense forests, small vegetations, gardens, agricultural fields, plantations and ceilings of buildings.

Pathogens and pathological conditions associated with this species are poorly documented. Given the potential for transmission of diseases between them, humans and domestic animals, the present case is documented. Susceptibility

of this species to a number of zoonotic pathogens including SARS corona virus (Guan *et al.*, 2003), rabies (Mastumoto *et al.*, 2011) and highly pathogenic avian influenza H5N1 (Roberton *et al.*, 2006) has been documented earlier. In this present communication, we report an outbreak of canine distemper in Asian palm civet which caused mass mortality in three areas of Thiruvananthapuram district, Kerala during the month of April, 2020.

CASE HISTORY AND OBSERVATION

About twenty palm civets died in the month of April in three different localities of Thiruvananthapuram district, Kerala. Clinical symptoms were mostly unnoticed and reports of carcasses being found in fields and near human households prompted the Animal Disease Control Wing, Thiruvananthapuram of Animal Husbandry Department, Kerala for investigating the deaths. As the time of the outbreak coincided with the COVID-19 epidemic in humans and national lockdown imposed by the government, it brought panic among public, media attention and curiosity among public health specialists. A total of five fresh carcasses representing three areas were brought to the State Institute for Animal Diseases, Palode for detailed post mortem examination. Gross pathological lesions were similar in all the carcasses revealing

pneumonia, gastroenteritis and meningitis. Samples were collected for laboratory investigations including histopathological and microbiological examinations. As epidemiological observations of rapid spread, mass mortality and pathological lesions suggested distemper like infectious disease, samples were tested for canine distemper by commercially available canine distemper virus (CDV) antigen test kits (M/s Bionote, Korea) and were positive (Fig. 1). Histopathological examination revealed pneumonia (Fig. 2), submucosal haemorrhage, mononuclear infiltration in stomach and intestine (Fig. 3) and nonsuppurative encephalitis. Characteristic intracytoplasmic inclusions were present in bronchial epithelial cells. Various other laboratory investigations conducted *viz.* bacteriological culture; antigen detection tests for rabies, canine parvo viral enteritis, canine corona viral enteritis, feline corona infection and feline panleukopenia were found to be negative. Based on the pathologic manifestations, test results and literature review (Techangamsuwan *et al.*, 2014; Wicker *et al.*, 2016), CDV was considered as the etiology of disease outbreak. Timely diagnosis could alleviate the anxiety of public and administrators.

DISCUSSION

Canine distemper epidemics are common in domestic dog population and



Fig 1: Rapid Immuno chromatographic Assay for CDV Antigen

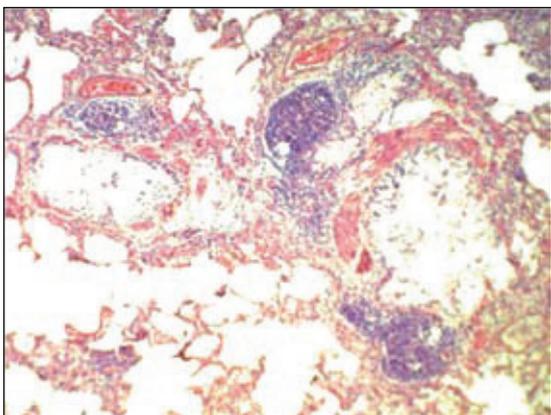


Fig 2: Section of pneumonic Lungs, 200X, H&E

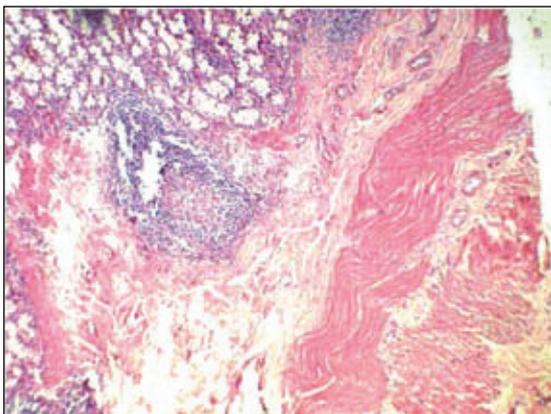


Fig 3: Section of intestine showing sub mucosal infiltration and hemorrhage, 400X, H&E

are not uncommon in captive zoo large felines and wild animals (Appel *et al.*, 1994; He Zhang *et al.*, 2017). Recently, CDV has expanded its host range into species that

are evolutionarily distinct from canines (Baumgartner *et al.*, 2003) as the one reported in this communication. Possible source of infection in this present outbreak could be direct contact with infected dogs or indirect contact with virus contaminated objects. The virus also spreads through aerosol droplets and contact with secretions of infected animals. These infected animals could pose a serious threat to the health of pets, zoo animals and wild animals in the areas they inhabit. Even though effective CDV vaccine are available for dogs, due to high cost and short protection period, vaccinations are not routinely carried out in field and hence immunological coverage is poor. The report highlights the importance of routine immunization in domesticated dogs and ensuring bio-security for domesticated pets. In India, where canine distemper is considered endemic in dogs, there are only limited studies of cross species infections. Cross species transmission can lead to deleterious effects in incidental hosts (Mendenhall *et al.*, 2016) as CDV has been described as an agent looking for new hosts (Baumgartner *et al.*, 2003).

Pathological lesions and laboratory findings typically resembled distemper infection (Appel *et al.*, 1994). Investigation in the present case is undoubtedly incomplete without molecular confirmation and characterization. However, it

merits reporting considering the health implications in animals and scarcity of documented reports of potential pathogens in civet cats which is a common animal in human habitats of India. It is of concern given the anthropogenic factors that bring humans and domestic animals into close contact with viverrids, facilitating transmission and spill over of organisms between species.

SUMMARY

An outbreak of canine distemper in Palm civets is reported highlighting the vulnerability of wildlife to common infectious agents and the possibility of transmitting the same to companion animals and vice versa.

Ethics statement: This study does not involve animal experimentation and was conducted on cases reported in the hospitals, following standard operating protocols of animal handling and sample examination, upon informed consent of owners.

REFERENCES

- Appel, M.J., Yates, R.A and Foley, G.L. 1994. Canine distemper epizootic in lions, tigers and leopards in North America. *J. Vet. Diag. Invest.* **6**(3): 277-288.
- Baumgärtner, W., Alldinger, S., Beineke, A., Gröters, S., Herden, C., Kaim, U., Müller, G., Seeliger, F., Van Moll Pa and Wohlsein, P. 2003. Canine Distemper Virus- An Agent Looking for New Hosts. *Dtsch. Tierarztl. Wochenschr.* **110**(4): 137-42.
- Guan, Y., Zheng, B.J., He, Y.Q., Liu, X.L., Zhuang, Z.X., Cheung, C.L., Luo, S.W., Li, P.H., Zhang, L.J., Guan, K.M., Butt, K.L., Wong, K.W., Chan, W., Lim, K.F., Shortridge, K.Y., Yuen, J.S., Peiris, M. and Poon, L.L.M. 2003. Isolation and characterisation of viruses related to the SARS coronavirus from animals in southern China. *Science*, **302**: 276– 278.
- He Zhang, Fen Shan, Xia Zhou, Bing Li, Jun-Qiong Zhai, Shu-Zhan Zou, Meng-Fan Wu, Wu Chen, Shao-Lun Zhai and Man-Lin Luo 2017. Outbreak and genotyping of canine distemper virus in captive Siberian tigers and red pandas. *Sci. Rep.* **7**: 8132.
- Matsumoto, T. K., Ahmed, O., Wimalaratne, S., Nanayakkara, D., Perera, D., Karunanayake, and Nishizono, A. 2011. Novel sylvatic rabies virus variant in endangered Golden palm civet, Sri Lanka. *Emerg. Infect. Dis.* **17**: 2346– 2349.
- Mendenhall, I.H., Low, D., Neves,

- E.S., Anwar, A., Oh, S., Su, Y.C.F., Smith, G.J.D. 2016. Evidence of canine parvovirus transmission to a civet cat (*Paradoxurus musangus*) in Singapore. *One Health*. **30** (2): 122-125.
- Roberton, S.I., Bell, D.J., Smith, G.J.D., Nicholls, J.M., Chan, K.H., Nguyen, D.T., Tran, P.Q., Stericher, U., Poon, L.L.M., Chen, H., Horby, P., Guardo, M., Guan, Y. and Peiris, J.S.M. 2006. Avian influenza H5N1 in viverrids: implications for wildlife health and conservation. *Proc. R. Soc. B*. **273**: 1729– 1732.
- Techangamsuwan, S., Banlunara, W., Radtanakatikanon, A., Sommanustweechai, A., Siriaroonrat, B., Lombardini, E. D. and Rungsipipat, A. 2014. Pathologic and Molecular Virologic Characterization of a Canine Distemper Outbreak in Farmed Civets. *Vet. Pathol.* 1-8.
- Wicker, L. V., Canfield, P. J. and Higgin D. P (2016). Potential Pathogens Reported in Species of the Family Viverridae and Their Implications for Human and Animal Health. *Zoonoses Public Health* **64** (2): 75-93.

