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Therapeutic management of canine distemper in dogs with alternate medicinal (homeopathy - Cicuta 30 C) approaches

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Abstract
Canine distemper (CD) is a most common highly contagious viral disease of domestic dogs, wild carnivores causing higher morbidity and mortality caused by Canine distemper virus (CDV), genus morbili virus, family paramyxoviridae. Fifty four dogs of various age groups were brought to the Infectious disease unit of Veterinary College and Research Institute, Namakkal with the history of lack/imcomplete immunization, anorexia, pyrexia and nervous signs. Congested conjunctival mucous membranes, abdominal pustules, purulent ocular and nasal discharge, continuous or intermittent seizures, temporal twitching (chorea), flexor spasms, generalised myoclonus, chewing gum seizures were noticed either alone or in combination in all dogs. Confirmatory diagnosis of CDV infection was done by Direct Flourescent Antibody Technique (DFAT) using anti-CDV antibody - Flourescein isothiocyanate (FITC) conjugate) and forty two dogs were positive for CDV infection. Affected dogs were treated with antibiotics, fluid therapy, vitamin B complex and other associated symptomatic therapy. Oral administration of homeopathic medicine *Cicuta virosa* (Drops. Cicuta – 30 C) was followed in all affected dogs showed remarkable clinical recovery including reduction in the frequency of flexar spasms, chorea and myoclonus. Hence it is recommended that Drops. Cicuta – 30 C can be added with supplements including Vitamin B complex for minimum of 30 – 45 days to reduce the nervous signs of CDV infection in dogs and warrants a future research on the use the homeopathic medicine for treatment of CD in dogs.

Keywords: canine distemper, dogs, homeopathy treatment

Introduction
Canine distemper (CD) is an acute, highly infectious viral disease with high fatality rates up to 50 percent of affected dogs and most common disease of domestic dogs (*Canis familiars*) throughout the globe (Swango *et al*., 1995) [13]. The disease is accounted for huge case fatality rates of affected dogs next to rabies (Deem *et al*., 2000) [6]. Causative agent of CD is Canine distemper virus (CDV), a member of genus morbilli virus, family Paramyxoviridae (Carvalho *et al*., 2012) [5] with wide host range including domestic and wild canids (Van de Bildt *et al*., 2002) [14] inclusive of domestic dogs, lions, tigers, leopards etc. (Appel *et al*., 1994) [2].
Canine distemper virus is a small, enveloped, non-segmented single-stranded, negative-sense RNA virus (about 15,000 bases long) that encodes 6 structural proteins (Martella *et al*., 2008) [11]. It is a pantropic virus targeting respiratory, gastrointestinal, cutaneous, nervous systems and eye of domestic dogs which are immunologically naive. After viral entry, it targets the lymphatic system causes primary viraemia. Followed by primary viraemic phase, the affected dogs exhibit non specific clinical signs including pyrexia, purulent ocular discharge, abdominal pustules and anorexia (Greene and Decaro, 2012) [8]. Neurologic manifestation of CD may occur 1–3 wk after recovery from acute generalized infection (Vandervelde and Cachin, 1992) [15]. Nervous complications are usually noticed in adult dogs without typical prior clinical manifestations. Generalised myoclonus, hypermetria, chorea, chewing gum seizures and flexor spasms were noticed either alone or in combination in CD affected dogs (Geetha and Selvaraju, 2019) [7]. Therapeutic regimen for CD affected dogs includes antibiotics, anticonvulsant drugs with supportive therapy including nerve tonics. Daily maintenance dose of anticonvulsant drugs ie. Phenobarbital sodium at the dose rate of 2-8 mg/kg body weight recommended by various authors including Greene and Decaro (2012) [8] in CD affected dogs. But administration of anticonvulsant medications transiently relieve nervous manifestations, hence continuous administration of them is mandatory. Prolonged administration of anticonvulsants like Phenobarbital have potential side effects including

lethargy, inco-ordination, increased appetite leads to overweight. To eliminate these potential side effects, alternate medicinal approaches for therapeutic management of CD affected dogs may be attempted to enhance the quality of life and to improve their longevity. Homeopathy is most popular, widely used alternate medicinal approach practiced throughout the world and does not have potential side effects and has been used for long time to treat nervous disorders of human. *Cicuta virosa* is recommended for alleviation of seizures in human (Boericke, 1906) [4]. Treatment of CD affected dogs with homeopathic medicine *Cicuta virosa* (Drops. Cicuta - 30 C) was attempted to alleviate the nervous signs and to improve the quality of life in this study.

Materials and Methods

A total of fifty four dogs of diverse age, sex, breed with anamnesis of lack/improper immunization were brought to the infectious disease unit of Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal, Tamil Nadu, India. Pyrexia, congested conjunctival mucous membranes, abdominal pustules, purulent ocular and nasal discharge, continuous or intermittent seizures, temporal twitching were the significant clinical findings noticed in all dogs. Peculiar nervous manifestations of CD including generalised myoclonus, hypermetria, chorea (temporal twitching) and flexar spasms without any previous illness history except ocular discharge and abdominal pustules were noticed alone or in combination in all dogs. Ocular discharges of the dogs were collected aseptically in a sterile swab and smears were made for demonstration of CDV using direct flourescent antibody test (DFAT) for confirmatory diagnosis as per the protocol recommended by Kapil and Neel (2015) [10] and forty two were positive. Affected dogs were therapeutically managed with antibiotic and other treatment protocols as per the recommendations of Greene and Decaro (2012) [8] for a period of five days. As an additional alternative therapeutic approach, homeopathy medicine Drops. Cicuta - 30 C (*Cicuta virosa*) was administered orally (five drops four times daily) for 30 to 45 days for all dogs and associated Vitamin B complex orally (Tab. Neurobion forte, Procter and Gamble Health Ltd., Ahmedabad, India). Notable clinical recovery was evidenced in all dogs including reduction in the frequency of seizures and myoclonus, intermittent chewing gum seizures, improved gait, resumption of food intake after one month treatment with Cicuta 30 C.

Results and Discussion

Canine distemper is one of the serious disease of unimmunized and improperly immunized dogs and its clinical manifestations depending upon the immune status of the dogs exposed to CDV infection and the virus has affinity for epithelial, lymphatic, nervous and endocrine systems (Kapil and Yeary, 2011) [9]. Clinical outcome of CDV infection in dogs ranges from complete recovery to persistent chronic infection completely relies on the age and immune status of the infected animals (Martella *et al*., 2008) [11]. Clinical signs are often unapparent or initially mild during initial phase of fever are mucopurulent oculonasal discharges, conjunctivitis, respiratory distress, anorexia, vomiting, diarrhea and dehydration, and cutaneous rash finally ends up in nervous signs (Appel *et al*., 1982) [1]. Nervous signs in CDV infection usually seen are generalised myoclonus, hypermetria, chorea, chewing gum seizures and flexor spasms either alone or in combination (Geetha and Selvaraju, 2019) [7]. Clinical signs seen in CD affected dogs in this study also resembles the reports of earlier author. Beineke *et al*. (2009) [3] who reported that the weak immunity of CDV affected dogs (humoral and cell mediated) favours systemic intracellular spread of virus to epithelial cells of gastrointestinal, urinary tracts, skin, endocrine and central nervous system leads to direct viral mediated damage ends up in localized twitching, ascending paresis/paralysis, and/or convulsions. The CDV infection may either prove fatal or persist resulting in sub-acute or chronic central nervous system (CNS) signs (Beineke *et al*., 2009) [3].

Canine distemper affected dogs in this study were either unimmunized or improper immunization history (only with primary dose of multivalent vaccines containing CDV, Canine adenovirus 1 and 2, Canine parvovirus and *Leptospira Icterohaemorrhagiae* and *L. Canicola*). Specific immunity is a host determinant playing a crucial role in prevention of life threatening diseases mainly CD as the dog's immune status is a primary intrinsic determinant decides the clinical outcome of the disease including nervous signs. Active immunity induced by proper immunization will assist in elimination of the CDV in primary/secondary viraemic phases thus have the potency to prevent further systemic invasion particularly nervous system (Greene and Decaro, 2012) [8]. Hence it is recommended that perfect immunization is a basic, affordable tool for primary prevention of fatality of dogs affected with CDV.

All CD positive dogs in the present study were treated as per the recommendations of Greene and Decaro (2012) [8] to counteract secondary bacterial complications sequel to viral damage and as a secondary preventive measure to reduce the course of the disease and to prolong the life of the animal.

Cicuta virosa (water hamlock) is recommended in homeopathy medicine for nervous system disorders like violent convulsions, trismus, tetanus, moaning and howling (Boericke, 1906) [4] in humans. Naveenkumar *et al*. (2019) [12] used *Conium maculatum* (Tab. Conium 30 C) for empirical treatment of CD affected dogs and reported clinical recovery. As an empirical therapeutic measure, oral administration of Drops. Cicuta - 30 C to CD affected dogs in this study ended up in remarkable clinical recovery from nervous signs after one month to forty five days treatment. Scientific reports on the use of Cicuta - 30 C for CD affected dogs are still lacking, hence its use in CD affected dogs definitely needs an equivalence experimental epidemiological study. But palliative therapy combined with Cicuta for CD affected dogs definitely improve the condition and prolong the life was proved in the present study.

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