

DIAGNOSIS AND THERAPEUTIC MANAGEMENT OF CENTRAL VESTIBULAR DISORDER WITH ENCEPHALITIS IN DOGS

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SUMMARY

Vestibular system is a major sensory system responsible for maintaining body balance. Four dogs were presented to the Referral Veterinary Polyclinic, Indian Veterinary Research Institute with a history of compulsive walking, head tilt, circling, nystagmus staggering and vomiting. Haemato-biochemical results were unremarkable except for leukocytosis. Screening tests were negative for haemoprotozoan disease, canine distemper and rabies. Neurological examination revealed abnormal proprioceptive and tactile reflexes. Magnetic resonance imaging (MRI) showed presence of diffuse edema in the brain suggestive of encephalitis involving cerebrum. Animals were stabilized with polyionic fluids DNS and RL (50 ml/Kg BW, IV) and therapeutic management included cefotaxime (50 mg/Kg BW, IV, BID), methyl prednisolone acetate (1 mg/Kg BW, IM once in 3 days), supportive therapy with Neurokind G (Gabapentine 300 mg and mecobalamine), vitamin B complex (1 ml/kg BW, IV) and ascorbic acid (30 mg/kg, BW, IV). Animals responded to therapy and showed uneventful recovery after 1 month of therapy.

Keywords: Encephalitis, Magnetic Resonance Imaging, Prednisolone acetate, Vestibular system

Vestibular system helps in maintaining the equilibrium and balance of body and is considered as primary component of nervous system (DeLahunta and Glass, 2009). Alteration in body posture and gait abnormalities may take place when vestibular system structures are compromised (Lowrie, 2012). The syndrome can be classified as central or peripheral based on the anatomical structures compromised (Dewey and Costa, 2016). The most common signs of vestibular disease recorded are head tilt, loss of balance, asymmetric rolling, ataxia, nystagmus and strabismus (Lorenz *et al.*, 2011). Disease mostly occurs in geriatric canine patients so named as old dog vestibular disease (Flegel, 2014). In the present study, central vestibular disorder in four dogs along with its therapeutic management has been described.

Four dogs (German Shepherd-2 and Labrador Retriever-2) with a history of compulsive walking, head tilt, circling, nystagmus, staggering, inappetance and vomiting were presented to Referral Veterinary polyclinic, Indian Veterinary Research Institute, Izatnagar (Fig. 3). All the cases were with complete vaccination history against rabies and canine distemper. Otoscopic examination revealed no gross abnormality in ear canal. Neurological examination (Fig. 1) of animals revealed normal withdrawal and wheelbarrow reflexes, while proprioceptive positioning, placing (tactile) test and paper slide tests were abnormal. Blood samples were collected for haemato-biochemical examination. Corneal impression smear and conjunctival swab along with nasal swabs were submitted to rule out

rabies and canine distemper, respectively. Magnetic resonance imaging (MRI) technique was performed to check for abnormalities in the brain (Fig. 2).

Haemato-biochemical findings were within normal range for all the four dogs except for slight leukocytosis ($19 \times 10^3 \pm 1241$ cells/ μ l). Samples sent for the diagnosis of canine distemper and rabies were found to be negative on polymerase chain reaction (PCR) and fluorescent antibody test (FAT), respectively. MRI examination revealed abnormal T2 and flair hyperintense signals with diffused edema in form of effacement of sulci with sparing of brainstem and cerebellum which is suggestive of encephalitis involving cerebrum. Based on clinical examination, neurological examination, MRI reports and response to therapy, the cases were diagnosed as central vestibular disorder.

Animals were stabilized initially with polyionic fluids like Inj. Dextrose normal saline (DNS) and Inj. Ringer's lactate (RL) (50 ml/kg BW, IV, SID). Therapeutic management involved Inj. Cefotaxime (50 mg/kg BW, IV, BID), Inj. Vitamin B complex (Neurokind plus @ 1 ml/kg BW, IV, SID) and Inj. Methyl Prednisolone acetate (1 mg/kg BW, IM, once in 3 days) to reduce edema which were administered for a week. Supportive therapy with Inj. Ascorbic acid (30 mg/kg BW, IV, SID) and Tab. Neurokind G (Gabapentin 300mg & Mecobalamine) 1 tab/10 kg BW, PO, BID for 10 days were given.

Disorders affecting the vestibular system are a common neurological problem encountered in small

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Fig. 1. Neurological examination to evaluate reflexes in dogs



Fig. 3. Animal showing head tilt and circling

animal practice. In order to establish an accurate etiological diagnosis, proper interpretation of neurological deficits and precise neuro-anatomical localization are essential. Magnetic resonance imaging helps in distinction of soft tissue including cerebrospinal fluid, nerves and vessels within internal auditory canal (Garosi *et al.*, 2003). Abnormal T2 and flair hyperintense signals with diffused edema in form of effacement of sulci as seen in magnetic resonance imaging can be a possible reason for hypertensive encephalopathy reported in veterinary medicine (O'Neill *et al.*, 2013). Diagnostics are aimed at defining an underlying etiology and diagnostic work up for vestibular dysfunction in advanced imaging such as computed tomography (CT) or magnetic resonance imaging (MRI).

Prednisolone has been used during acute phase of idiopathic vestibular syndrome along with supportive therapy (Fitzmaurice, 2010). Corticosteroid therapy is beneficial as it is immunosuppressive, anti-inflammatory and reduces CNS edema as well decreases CSF production (Jeffery, 2014). Gabapentin has neuromodulatory effect on hyperexcitable damaged nervous system and can be used along with NSAIDs (Rusbridge, 2005). Vitamin B complex may serve the function of nutritional support for neurologic activity as it may help in gamma-aminobutyric acid (GABA) synthesis or glycogen breakdown (Plumb, 2011). In the present study, four cases of central vestibular disease were diagnosed and successfully managed with cefotaxime, methyl prednisolone acetate and supportive

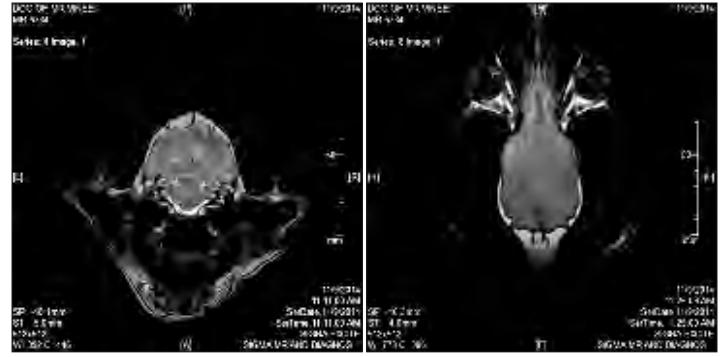


Fig. 2. Magnetic resonance imaging showing diffused edema in form of effacement of sulci

therapy with ascorbic acid and gabapentin.

CONCLUSION

In the present case study, diagnosis and successful therapeutic management of canine vestibular disorders has been depicted. Confirmatory diagnosis was made based on neurological examination and magnetic resonance imaging.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

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