

CENTRAL VESTIBULAR DISEASE IN A GERMAN SHEPHERD DOG

Neetu Saini¹, Praveen V. Mathapati², Sujata Turkar¹, S.K. Uppal³ and Dipak Deka

¹Assistant Professor, ²M.V.Sc. Student, ³Professor & Head; Department of Veterinary Medicine. College of Veterinary & Animal Science, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab.

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An eight year old German shepherd bitch was presented with history of fever, head tilt and vomiting. Animal was unable to balance with signs of incoordination, falling, proprioceptive deficits and nystagmus. Hematological examination revealed severe neutrophilic leukocytosis. Biochemical parameters of LFT and RFT were within normal range. Radiography of skull revealed normal air density in both ear canals and tympanic bullae. Thyroid function test were within the normal range. Reverse transcriptase PCR for Canine distemper virus was positive. The animal was treated with antibiotics and vestibule sedative drugs. The animal was clinically improved, however head tilt persists even two months after the treatment. Based upon history, clinical signs and diagnostic tests, it was concluded that Canine Distemper Virus (CDV) was responsible for Central Vestibular Disease (CVD) in present case.

Keywords: Central vestibular disease (CDV), Dog, Neurological, Neutrophilic leukocytosis.

Neurological disorders affecting vestibular system are commonly found in small animal practice. Vestibular system is the main component of nervous system responsible for maintaining balance, coordinated head movements, trunk and limbs (Chaves *et al.*, 2014). The clinical signs associated with central or peripheral vestibular dysfunctions include head tilt, loss of balance, circling, falling, rolling, ataxia and abnormal eye movements (Nelson and Couto, 2014). Neurological examination findings help to differentiate lesions of central vestibular system (CVS) from peripheral vestibular system (Kent *et al.*, 2010) by absence or decrease of postural reactions, altered consciousness level and vertical

nystagmus (De Lahunta and Glass, 2009). Inflammatory/ infectious diseases mainly canine distemper are commonly associated with central vestibular diseases in dogs (Kent *et al.*, 2010). This case report presents diagnosis and therapeutic management of central vestibular disease in a German shepherd dog.

Case History and Observations

A 8 year old German shepherd bitch weighing 25 kg was presented to Teaching Veterinary Hospital, College of Veterinary & Animal Science, Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana with the history of fever, head tilt (Fig.1)



Fig 1: Head tilt in German shepherd dog due to Central Vestibular Disease.

and vomiting. On clinical examination, dog was depressed, recumbent with high rectal temperature (104°F), congested mucous membranes and dyspnea. Head was tilted towards left side with ear pointing towards the ground. The dog showed signs of incoordination, falling, proprioceptive deficits on the same side of head tilt and vertical nystagmus. There were no deficits of cranial nerves and no purulent discharge from ear canals. Palpation of the osseous bullae and temporo-mandibular joint did not reveal any pain or asymmetry.

Blood investigations showed significant leukocytosis (Total leukocyte count=68,320/ μ l; reference range, 5,000-14,100/ μ l) with neutrophilia (62,854/ μ l; reference range, 5000-14100/ μ l). Platelet count was slightly low (1.51×10^5 / μ l; reference range, $2.1-6.2 \times 10^5$ / μ l). Biochemical analysis revealed normal liver function test (LFT) and renal function tests (RFT). Thyroid function tests i.e. Total T4 and TSH were within the normal range.

Radiography of skull revealed normal air density in both ear canals and tympanic bullae. The bone density of the skull was slightly reduced. Lateral chest radiograph revealed normal heart size, increased radio-opacity in caudo-dorsal and cranial lung lobes. In Ventro-dorsal (VD) view, all the right and left lung lobes have increased radio-opacity indicating presence of pulmonary edema. A 6-lead ECG recording revealed normal sinus rhythm with heart rate 100 bpm. Nasal and ocular samples were collected to run Reverse transcriptase- polymerase chain reaction (RT-PCR) to rule out canine distemper and it was found positive. RT-PCR was carried out using N gene based primers where the positive sample showed 407bp amplification similar to the positive control. So based upon history, clinical signs and diagnostic tests, it was concluded that Canine distemper virus was responsible for central vestibular signs in the present case.

Treatment and Discussion

The patient was empirically treated with Cefotaxime (25mg/kg I/M every 12 hourly) and Enrofloxacin (7mg/kg IM every

12 hourly) for 2 weeks to treat secondary bacterial infection. Normal saline @ 20 ml/kg b.wt. I/V every 12 hourly was given for 4 days to treat dehydration. The vomiting in this dog was controlled with vestibulosedative drug meclizine (1mg/kg, every 24 hourly) for 3 days. The animal showed significant improvement in clinical condition after 2 weeks of treatment. The secondary bacterial infection was controlled with total leukocyte count (20,270/ μ l) and neutrophil count (18,243/ μ l). However, the head tilt persisted even after two months of treatment.

The clinical features of vestibular dysfunctions are abnormalities of the gait, head, body and limb posture and eye movements as also reported by De Lahunta and Glass (2009). However, vomiting and nausea are also occasionally present as mentioned by Chaves *et al.* (2014) also. The clinical signs of head tilt, ataxia, altered postural reaction i.e. proprioceptive deficits, altered level of consciousness confirms central vestibular disease in present case. Proprioceptive deficits are related to brain stem lesions and are consistent with central vestibular disease as also reported by Kent *et al.* (2010) and Troxel *et al.* (2005). The paresis of limbs as seen in present case was could be due to the injury to upper motor neuron pathways that project through brain stem indicating central vestibular syndrome. In present study, the dog was completely non ambulatory showing tetraparesis which cannot occur in dogs with peripheral vestibular disease, so confirming CVD as also recorded by Troxel *et al.* (2005). Radiographic examination of tympanic bullae did not reveal any abnormality in ears, so ruling out ear infection (otitis). Signs of altered mentation and depression present in this case could be due to defect in reticular activator system located in brain stem resulting due to CVD. Inflammatory/ infectious diseases mainly Canine distemper involving the central nervous system are most frequently associated with signs of vestibular disease as also reported by Chaves *et al.* (2014). Higgins *et al.* (2006) reported that central vestibular dysfunctions have also

found to be sequelae of hypothyroidism in dogs. Contrary to that, in present case, the thyroid function tests were normal so excluding possibility of hypothyroidism.

Haematological examination revealed neutrophilic leucocytosis in the present case which could be associated with secondary bacterial complications such as pneumonia due to canine distemper as also mentioned by Sherding (2006). Radiology of chest may demonstrate an interstitial (viral) pneumonia in early cases and an alveolar pattern with bacterial pneumonia as observed in present case may occur later in the course of canine distemper disease. The vestibule sedative drug meclizine was given for one week to alleviate emesis as recommended by Nelson and Couto (2014) also. So, based on history of sudden development of left sided head tilt with tight circling on the same side, absence of any lesion or infection in the ear, exclusion of other diseases, absence of any radiological evidence of involvement of tympanic bullae and bony labyrinth, altered mentation, proprioceptive deficits, vertical nystagmus in the 8 year old dog appeared due to Central vestibular disease.

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