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Letter to the editor

Muscle Weakness and Hyporeflexia; is Diabetic Neuropathy the Culprit?

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Diabetic neuropathy (DNeur) is not frequently seen in dogs. Primary clinical findings in dogs involve chronic and progressive hindlimb weakness, probably extending to occur within the forelimbs (Morgan et al., 2008; Schaer, 2010). Actually the real incidence of peripheral neuropathy (PN) presenting in dogs with diabetes mellitus (DM) remains unclear (Morgan et al., 2008). Prior researches regarding canine diabetic neuropathy (DNeur) might be classified to those of dogs with subclinical PN (Steiss et al., 1981; Braund and Steiss, 1982; Sharma et al., 1995; Ghani et al., 1999; Walker et al., 2001), and to those of which dogs with clinical signs of PN (Anderson et al., 1983; Johnson et al., 1983; Katherman and Braund, 1983). In several studies including dogs with spontaneous or experimental DNeur, presenting no neurological signs, diagnosis was based on histopathologic or electrodiagnostic findings (Steiss et al., 1981; Braund and Steiss, 1982; Sharma et al., 1995; Ghani et al., 1999; Walker et al., 2001). Contrarily clinical signs of PN associated with spontaneous DM was described among 4 different studies (Anderson et al., 1983; Johnson et al., 1983; Katherman and Braund, 1983).

Figure 1. Clinical appearence of a dog with DNeur. At physical examination a) a profound muscle weakness , c-d) hyporeflexia, and hypotonia were evident. Left forelimb was affected, in which the dog was unvoluntarily walking. Following 6 months of treatment e) the dog was presenting better locomotor activity.

Şekil 1. Diyabetik nöropatili köpeğin klinik görünümü. Fiziksel muayenede a) belirgin bir kas zafiyet, c-d)hiporefleksi ve hipotoni mevcuttu. Sol ön ayak etkilenmiş, olgu gönülsüz olarak yürümekteydi. Sağaltımı takiben 6. ayda e) köpeğin daha iyi bir lokomotor aktiviteye sahip olduğu gözlemlenmekte.

The diagnosis of a PN is supported by clinical signs, nerve biopsies, and muscle biopsies, besides by electromyographic examination (Cuddon, 2002; Inzana, 2005). As was also afromentioned above clinical signs suggestive of a PN include muscle atrophy/weakness, hyporeflexia, and hypotonia (Munana, 1995; Cuddon, 2002; Inzana, 2005).

Table 1. Serum biochemical analysis of a 7 years old male dog with DNeur receiving alpha lipoic acid.
Tablo 1. Alfa lipoik asit uygulanan Diabetik nöropatili 7 yaşlı erkek köpekte serum biyokimyasal analiz sonuçları.

Test (mg/L) (reference interval)	Fructosamine (µmol/L)	HbA1c (%)	Glucose (mg/dL)
Day 0	540	7.8	376
6 months later	475	6.4	230

An 6-years-old, intact male, crosbred dog was examined at the University of Adnan Menderes, Faculty of Veterinary Veterinary, Department of Internal Medicine, for a 7-months history of limb weakness, with waxing and wanning signs. While standing (Figure 1 a-d) and walking, the affected limb was less prone to weight bearing. The affected limb was thinner and smaller width than other, relatively. During walking moderate/ severe lameness was observed.. The dog had a 2,5-years history of DM, which was being treated with Humulin-R (human recombinant) and first occasion, and afterwards by Humulin-N [neutral protamine Hagedorn (NPH) insulin] by private veterinary practice. On admission to our clinic serial blood glucose measurements, glycolized haemoglobin-HbA1c and fructosamine (Table 1) were analyzed. The owner was instructed to alternate the dose for insulin preperation, besides especially forced for usage of alpha lipoic acid (Thioctacid 600 HR, 600 mg, Meda Pharma GmbH, Germany) at a dose of 50 mg/kg (Paetau-Robinson et al., 2013) for 6 months.

Following 6 months of treatment the dog was otherwise healthy and muscle weakness was disappeared (Fig. 1e). It was observed that metabolic panel values was better than the initial submission (Table 1). Alpha lipoic acid has been extensively tested for its efficacy in human medicine against diabetic polyneuropathy to several other diseases (Grunert , 1960; Baur et al., 1991; Packer et al., 1995; Wenzel et al., 2005; Yadav et al., 2005; Ziegler et al., 2006; Holmquist et al., 2007; Sehirli et al., 2008). Furthermore it has been recommended for treatment of different diseases in veterinary field [i.e. DM, DNeur (Wynn and Marsden, 2003; Means, 2008) cataracts and glaucoma (Wynn and Marsden, 2003). In the present study the latter compound resulted with glucose lowering effects, and to the present authors' knowledge prevented the development of the condition. More detailed clinical studies are further warranted in an attempt to understand the efficacy of alpha lipoic acid for treatment of DNeur in dogs.

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