DEVELOPMENT OF A MOTOR UNIT NUMBER ESTIMATION TECHNIQUE IN NORMAL DOGS: A POTENTIAL BIOMARKER FOR CANINE DEGENERATIVE MYELOPATHY

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ABSTRACT

Motor unit number estimation (MUNE) is an electrophysiologic technique for quantifying the lower motor neuron (LMN) system. MUNE has proven useful in evaluating and monitoring neurodegenerative diseases such as amyotrophic lateral sclerosis (ALS). Recently a missense mutation in the canine superoxide dismutase 1 (*SOD1)* gene has been shown to be a risk factor for canine degenerative myelopathy (DM) suggesting homology to familial *SOD1* ALS. To date, the LMN component of DM has not been well characterized or quantified. The modified incremental stimulation MUNE technique was applied to the sciatic-deep peroneal nerve branch with bilateral recordings at the extensor digitorum brevis muscle of 17 clinically normal dogs. Mean ($\pm$ SD) value for the entire MUNE pool was 51 ± 21 with a range from 8 to 154. No statistically significant difference was noted between pelvic limbs (P=0.14) or between different age groups (< 7years old or $\geq$ 7 years old) (P=0.17). Test-retest reliability was assessed for trials performed under different anesthetic episodes (intermittent) versus trials performed under the same anesthetic episode (consecutive). The intraclass correlation coefficients for consecutive and intermittent MUNE evaluations were 0.73 and 0.65, respectively. These results provide preliminary reference ranges for normal dogs and document the potential utility of EDB modified incremental stimulation MUNE for longitudinal monitoring of lower motor neuron loss in DM affected dogs.