Expanding Our Understanding of Exercise-Induced Collapse

Exercise-Induced Collapse (EIC) is a medical condition that occurs in a significant proportion of Labrador Retrievers. During an episode of energetic exercise, otherwise healthy dogs will suddenly experience limb weakness and fall down. Although most dogs recover quickly, within 30 minutes, severe episodes of EIC can be fatal. Dogs affected by the condition often experience numerous recurrences, although their gait and behavior return to normal between episodes.

In 2008, scientists made an enormous step forward in their understanding of the pathogenesis of EIC in Labrador Retrievers. They discovered that many dogs with the condition were homozygous for a mutation of the dynamin 1 protein (DNM1). DNM1 is an enzyme that had been linked to various cellular processes, and it made sense that a mutation would be associated with the symptoms of EIC. Soon, with the support of the AKC Canine Health Foundation, scientists were able to develop a test for the mutation, an enormous leap forward for dogs with EIC. Today, Labrador Retrievers with the dysfunctional form of the protein can be diagnosed via blood test with the condition known as DNM1-associated exercise-induced collapse, or d-EIC.

Once the test was available, however, it quickly became clear that the existence of the DNM1 mutation didn't explain all cases of EIC in the breed. Some Labrador Retrievers with EIC didn't have both copies of the mutation, others didn't have copies at all. Therefore, the scientists from the University of Minnesota and the University of Saskatchewan who had developed the test set out to determine if they could understand whether the EIC seen in dogs without the mutation was really the same condition as d-EIC.

In the March 2013 issue of the Journal of the American Veterinary Medical Association, those scientists published results suggesting that the two conditions might not be the same after all. Not only did dogs without the DNM1 mutation tend to be significantly older than d-EIC dogs at the time of their first collapse, the ways they collapsed also tended to be somewhat different. Dogs with d-EIC were more likely to experience a collapse starting in their hind limbs, and almost half experienced a collapse only affecting those limbs. In contrast, dogs without the mutation were extremely unlikely to only be affected in their hind limbs, and there was more diversity in which limbs were affected first. Another clear distinction between d-EIC and the type of collapse seen in dogs without the mutation was that dogs d-EIC were much more likely to be thinking and reacting normally at the time of a collapse.

If the type of EIC seen in Labrador Retrievers without the DNM1 mutation isn't the same as d-EIC, what is it? That's a good question, and one that scientists will continue to investigate. There's a good chance that it isn't a single condition at all, but that multiple disorders may actually be responsible for exercise intolerance in the breed.

Publication:
Relationship between dynamin 1 mutation status and characteristics of recurrent episodes of exercise-induced collapse in Labrador Retrievers, Eva Furrow, VMD, DACVIM; Katie M. Minor, RN; Susan M. Taylor, DVM, DACVIM; James R. Mickelson, PhD; Edward E. Patterson, DVM, PhD, DACVIM; Journal of the American Veterinary Medical Association, March 15, 2013, Vol. 242, No. 6, Pages 786-791
Dr. Eva Furrow, the lead author on this publication, was also selected as a 2014 AKC Canine Health Foundation Clinician-Scientist Fellow. See more at: http://www.akcchf.org/research/success-stories/understanding-EIC.html#sthash.TWSLNdup.dpuf

This article is provided by the AKC Canine Health Foundation whose mission is to advance the health of all dogs and their owners by funding sound, scientific research and supporting the dissemination of health information to prevent, treat, and cure canine disease. For more information or to support their work visit www.akcchf.org.

AMERICAN KENNEL CLUB
CANINE HEALTH FOUNDATION
PREVENT TREAT & CURE

AMERICAN KENNEL CLUB 20 years CANINE HEALTH FOUNDATION