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Research Briefs

Screening available for heredity bleeding disorder in Kerry blue terriers

Coagulation factor XI (FXI) deficiency, a heredity bleeding disorder, was first described in the Kerry blue terrier in the 1980s. Since then affected dogs have been recognized regularly, but the distribution and frequency of this disorder is unknown in Kerry blue terriers. The defect is inherited by an autosomal trait with dogs homozygous and possibly heterozygous having an excessive bleeding tendency. The mutation causing FXI deficiency in Kerry blue terriers has very recently been identified at Penn, which is now offering the opportunity to screen Kerry blue terriers at risk for this mutation.

Courtesy of dogsindepth.com

Dogs with hereditary FXI deficiency may exhibit an increased bleeding tendency following trauma or surgery (even after too-short nail clippings or simple surgical skin-mass removals) or rarely appear to develop spontaneous bleeding. Some FXI-deficient dogs may bleed excessively after one event, but not others. Furthermore, as some dogs remain completely asymptomatic, the diseased/mutant gene may be unknowingly passed on to the next generation, not only via heterozygous but also homozygous affected dogs. Carriers or heterozygotes have one mutant and one normal gene, and homozygous animals have two mutant copies of the diseased gene. Homozygously affected animals are believed to have a more severe bleeding tendency.

Screening Kerry blue terriers with a clotting test may suggest FXI deficiency to a veterinarian, and measurement of low plasma FXI coagulant activity could confirm a diagnosis of FXI deficiency at a reference laboratory. However, coagulation tests generally require blood collection in citrated tubes, which are immediately separated and shipped, making it impractical as a simple screening test. Only a small number of Kerry blue terriers have been tested, and hence the frequency and bleeding tendency are as yet unknown.

Drs. Eva Tcherneva, research associate, and **Urs Giger**, Charlotte Newton Sheppard Professor and chief of Section of Medical Genetics, have developed and made available at their laboratory a mutation-based DNA test to screen for FXI deficiency in Kerry blue terriers. This test can clearly identify homozygous and heterozygous affecteds, as well as normal Kerry blue terriers. They recommend testing any Kerry blue terrier with signs of bleeding, as well as its relatives. Furthermore, screening these terriers prior to breeding is advisable to limit the spread of this disorder, particularly via any popular sires. Carriers still can be used in future breeding programs, but identifying carriers will allow the targeted breeding of carriers with desirable traits to normal dogs, without producing homozygous affected dogs, as long as the offspring are also tested and only unaffected dogs used thereafter.

The School's Josephine Deubler Genetic Testing Laboratory offers screening for FXI deficiency in Kerry blue terriers. Samples suitable for this DNA test include 1-2 ml EDTA-anticoagulated blood (preferable) or 2–3 cheek swabs (with special cytobrushes). Brushes and test submission forms are available from the lab (www.vet.upenn.edu/penngen), through the United States Kerry Blue Terrier Club (www.uskbtc.com) or Kerry Blue Terrier Foundation (www.kerryblues.info). For more information on canine FVII deficiency and for screening materials, please contact Dr. Giger (215-898-8894 or -8830; penngen@vet.upenn.edu). The original studies and the DNA screening are supported in part by the Kerry Blue Terrier Foundation, the National Institutes of Health and some owners and breeders of Kerry blue terriers.

Are Owners Who Relinquish Dogs Truthful about Their Pets' Behavior?

A paper entitled "Evaluation of a behavioral assessment questionnaire for use in the characterization of behavioral problems of dogs relinquished to animal shelters"—coauthored by **Dr. James Serpell**, Marie A. Moore Professor of

Humane Ethics and Animal Welfare and director of the Center for the Interaction of Animals and Society, and colleagues from the University of California–Davis—appeared in the December 2005 issue of the *Journal of the American Veterinary Medical Association*. The goal of the study was to evaluate the accuracy of a behavioral intake questionnaire given to owners leaving their dogs at shelters.

Animals participating in the study were 54 dogs being relinquished to a shelter and 784 dogs belonging to clients of the Ryan Veterinary Hospital. The owners leaving animals at shelters were split into two groups: one was guaranteed that all information regarding the animal would be kept confidential, and the other was told information would be shared with shelter staff. Compared with the client owned–group data, significantly more relinquished shelter dogs in the confidential group were reported to have owner-directed aggression, stranger-directed aggression, dog-directed aggression or fear, stranger-directed fear, nonsocial fear and separation-related behaviors. Results suggest that behavioral questionnaires may sometimes provide inaccurate information in a shelter setting, but the information may still be useful when evaluating behavior of relinquished dogs.

MRI a Useful Tool in Diagnosing Masses in Dogs

With funding supplied by the Morris Animal Foundation, **Dr. Chick Weisse, V'98**, assistant professor of soft tissue surgery, and Dr. Craig Clifford, former resident of oncology at the Ryan Veterinary Hospital, found that magnetic resonance imaging is extremely useful as a diagnostic tool for dogs with liver and splenic masses. Using MRI sequences, scientists can see how much a cancer has spread, giving owners an option of foregoing surgery in favor of MRI.

A New Way to Relieve Pain in Dogs

Dr. Dottie Brown, assistant professor of surgery at the Ryan Veterinary Hospital, participated in a study examining new ways to help relieve the pain of dogs with cancer or arthritis. The results show some unusual and unexpected pain-management properties of a compound called resiniferatoxin (RTX), a red-hot sap produced by a Moroccan cousin of the chili pepper plant.

Researchers at the National Institutes of Health in an attempt to better understand pain in human beings discovered that, in cancer patients, pain messages were sent to the brain by certain nerve cells in the spine. But these nerve cells, the researchers found, could be killed if infused with calcium—and once killed, the pain messages could be stopped. When RTX—about 1,000 times more potent than the capsaicin that makes chili peppers hot—comes into contact with the pain-transmitted nerve cells, it spurs a rush of calcium into the cells, destroying them and providing relief from the pain of cancer.

The NIH team found RTX seemed to work on lab animals, but needed more evidence to support their claim. And because humans and dogs are so similar, medically speaking, they turned to Dr. Brown, whose work had put her in contact with dogs suffering from severe cancer pain. Dr. Brown then selected dogs that might make good case studies. She chose a group diagnosed with cancer that were so painful they were unable to put weight on their limbs.

After taking injections of RTX, the same dogs could run and jump almost as if they felt no pain at all. The cancer persisted—and eventually proved fatal—but owners reported weeks or months of good times after RTX treatment. The initial trial was such a success that Dr. Brown will conduct another, more thorough study this summer. Meanwhile, the NIH team is pushing to begin testing RTX on humans soon.

Students from the Beta Chapter of Phi Zeta Veterinary Honor Society recently presented research papers at the School of Veterinary Medicine. Abstracts from the student presentations can be found at www.vet.upenn.edu/bellwether/researchbriefs.