Canine Stress Syndrome

By Dr. Karen Becker

Hi, this is Dr. Karen Becker. Today we’re going to discuss canine stress syndrome, which is called CSS. It’s also called canine malignant hyperthermia or CMH. This is a relatively rare inherited disorder that can cause a dog to have potentially life-threatening reactions in response to very specific triggers. The disorder is called canine stress syndrome because it tends to show itself when a dog is under stress or overstimulated.

Triggers for episodes of CSS include excitement, apprehension, too much exercise, too intense exercise, ingestion of food ingredients such as caffeine or hops, environmental stress, vaccines, and certain anesthetic agents and other specific drugs that can affect the neurologic and muscular systems of the body.

Certain breeds are predisposed to carrying the genetic mutation that causes CSS. The condition has been reported in the bichon, Border collie, golden retriever, greyhound, Labrador retriever, the pointer, Saint Bernard, and the springer spaniel.

Canine stress syndrome is caused by defective calcium ion channels in the striated muscles that connect the bones in a dog’s legs and spine and are responsible for voluntary coordinated movement such as walking and head movements. Muscle contractions are dependent on calcium levels. In normal muscles, increases and decreases in calcium levels occur very rapidly, allowing precise control of muscle movement.

In a dog with CSS, faulty control of calcium levels leads to calcium leakage, which makes muscles more susceptible to physiological stress in certain drugs. In addition, when the muscles in a CSS dog are activated, it triggers the release of abnormally large amounts of calcium, resulting in muscle rigidity.

Symptoms and Diagnosis

The syndrome causes a range of symptoms, including abnormally high body temperature, muscle tremors, muscle rigidity, seizures, rapid and irregular heartbeat, increased breathing rate, a bluish tinge to the skin and mucous membranes, unstable blood pressure, fluid buildup in the lungs, impaired blood coagulation, and in the worst case scenarios, kidney failure.

Diagnosis of malignant hyperthermia is usually based on observing the symptoms a dog develops while under stress or after being given certain anesthetic drugs. Symptoms can occur gradually or quickly, and include muscle stiffness, twitching, and a really increased heartrate and respiratory rate. Dogs under stress, but not anesthetized, may have openmouthed breathing and an increased breathing rate.

In light colored dogs, the skin can at first lighten then turn red, then finally take on a bluish hue. The body temperature can increase to as much as 113 degrees Fahrenheit during an episode.
There are several laboratory tests than can help identify dogs susceptible to CSS, but they can’t be used as a diagnostic tool in the middle of a crisis.

If a dog with CSS undergoes anesthesia using halothane gas, the results can be quickly fatal. This is why it’s really important to identify a dog with this mutation through DNA testing prior to scheduling surgical procedures.

**Treatment and Recommendations**

There’s no cure for malignant hyperthermia, since episodes come on suddenly and are typically very severe. Sadly, this condition can often be fatal. That’s why it’s important to identify dogs with a gene mutation as early as possible, and take steps to prevent CSS symptoms from ever developing.

It’s recommended that dogs with this disorder who require anesthesia for any type of veterinary procedure receive a muscle relaxant drug prior to being anesthetized. Certain anesthetic agents like halothane should obviously be avoided, but there are other anesthetic drugs that are totally safe to use with CSS patients. So there are some options out there. Veterinary procedures must be kept as short as possible, so those dogs need to remain under anesthesia for as short as possible. Because CSS episodes most often occur after an animal’s been anesthetized for more than an hour.

Most CSS treatments focus on managing secondary conditions resulting from defective calcium metabolism. In traditional veterinary medicine, these may include seizure control medications, glucose therapy, and the use of tranquilizers during really stressful situations. CSS dogs should also be protected from stressful situations, intense exercise, and food and drugs that can trigger symptoms. While these precautions aren’t foolproof in preventing malignant hyperthermia, they can reduce the chances that a crisis will ever develop.

[END]