



Cocker Spaniel Update

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Researchers Study Ways to Diagnose Liver Disease Sooner

Chronic liver disease can be life-threatening. When the liver becomes inflamed or fails to function normally, it is unable to properly filter toxins from the body. Cocker Spaniels are prone to two types of liver disease: chronic hepatitis and portosystemic vascular anomalies, more commonly known as liver shunts.

Two studies are looking at ways to diagnosis these conditions sooner. Researchers at the School of Veterinary Medicine at the University of Wisconsin at Madison are investigating whether antibodies can help identify dogs with hepatitis. Meanwhile, a study at Washington State University is evaluating magnetic resonance imaging as a way to better diagnosis liver shunts.

Early treatment can make a difference in the management of both conditions. Since early detection can be beneficial, it is important for owners and breeders of Cocker Spaniels to be aware of the signs of liver disease, especially since signs may occur subtly or if liver disease runs in a dog's bloodline.

Inflammation of the Liver

Chronic hepatitis is inflammation of the liver that results in progressive damage to liver cells. Eventually scar tissue overtakes healthy liver tissue, and the liver is no longer able to function normally. Among the known causes

of chronic hepatitis in dogs are drug toxicity and infections.

Lauren Trepanier, D.V.M., Ph.D., DACVIM, associate professor of small animal internal medicine at the University of Wisconsin, says, "The cause of liver inflammation in chronic hepatitis in most dogs is not known. A disease agent, such as leptospirosis, can cause acute hepatitis, but investigators have not found a virus similar to human hepatitis B or C in dogs."

Signs of chronic hepatitis are vague, which make it difficult to identify in dogs. The disease ranges from mild liver problems to complete liver failure. Poor appetite, intermittent vomiting and lethargy are early signs. As the condition progresses, fluid buildup in the abdomen, ulcers in the gastrointestinal tract, and liver encephalopathy, or neurological impairment, which can manifest with signs such as confusion, circling, head pressing, staring or seizures, can occur.

A liver biopsy is the only definitive way to diagnose chronic hepatitis; however, a biopsy requires sedation or anesthesia and can be expensive. A presumptive diagnosis can be made based on abnormal liver enzymes and liver function tests. The benefit of diagnosing liver disease early is "being able to develop an individualized treatment plan and improve the dog's quality of life," Trepanier says.

In her research, Trepanier is studying antibodies directed against different liver proteins to determine whether they will help identify dogs with chronic hepatitis. "Our goal is to understand whether antibodies

Liver Disease Information Available Online

An e-mail group called canineliver-d offers online information for owners of dogs with chronic liver disease. For information visit <http://groups.yahoo.com/group/canineliver-d/> or send an e-mail to canineliver-d-subscribe@yahoogroups.com.

form against certain liver proteins in chronic hepatitis in dogs; such antibodies are seen in up to 20 percent of people with hepatitis, and can help with diagnosis, choosing treatment, and monitoring response to therapy," she says.

So far, the research, which is funded by the AKC Canine Health Foundation, has identified a pattern of antibodies that is present in about one-third of the dogs with chronic hepatitis studied to date. A technique known as immunoblotting is used to analyze small amounts of protein to detect antibody binding.

The information will allow the research team to potentially identify the liver proteins that may be under attack in dogs with chronic hepatitis. One of the long-term goals of the researchers is "to understand whether certain antibodies are associated with a particular pattern on liver biopsy or a response to certain medications," Trepanier says. "Testing for these antibodies could tell veterinarians which treatment is most likely to be effective and, most important, might enable diagnosis without a surgical biopsy."

Management of chronic hepatitis can be challenging for veterinarians when the cause is unknown. In these

Recognizing Signs of Liver Disease

Signs of chronic liver disease can be vague and difficult to recognize. Owners and breeders should be familiar with indications of liver disease and see a veterinarian immediately if they notice these signs:

- Poor appetite;
- Intermittent vomiting;
- Lethargy;
- Depression;
- Confusion, head pressing or staring; and
- General ill health, stunted growth and poor hair coat.

Other signs as liver disease progresses include:

- Fluid buildup in the abdomen; and
- Liver encephalopathy, a central nervous system disorder caused by inability of the liver to eliminate ammonia and other toxins, leading to neurological impairment.

Liver Disease

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cases, veterinarians typically prescribe supportive anti-inflammatory medication, antioxidants, medication to help increase bile flow, and antifibrotic agents to help decrease scarring of liver tissue. Since dogs with liver disease often have decreased appetite, it is important to make sure they are fed a palatable diet that meets their caloric needs.

Congenital Liver Shunts

Another liver disease that occurs in Cocker Spaniels is portosystemic vascular anomalies (PSVA). A defect in which blood is diverted from flowing correctly through the liver, PSVA causes unfiltered blood from the gastrointestinal system to bypass the liver and circulate through the body, resulting in a life-threatening buildup of harmful toxins in the body.

Cocker Spaniels are among the breeds likely to have congenital PSVA, although the condition also can be acquired later in life due to another illness, such as hepatitis or cirrhosis. Cockers typically develop extrahepatic shunts in which the abnormal vessel is located outside the liver. This type generally involves one or two large veins and is usually easy to correct surgically. In contrast, large breeds tend to develop intrahepatic shunts, or those located inside the liver. These are more difficult to treat and may involve small, multiple veins.

Signs of PSVA include lethargy, circling, confusion, blind staggers, head pressing, staring or seizures. General ill health, such as stunted growth and a poor hair coat, are common as well. Excessive drinking, urinating, diarrhea or vomiting are less common signs. Clinical signs are often observed before an animal is 1 year old and sometimes as early as 3 months of age.

A definitive diagnosis of PSVA is made using cross-sectional imaging, such as magnetic resonance imaging (MRI) or computed tomography (CT). A study at Washington State University focuses on whether MRI is the best way of diagnosing the condition.

Patrick Gavin, D.V.M., DACVR, professor of veterinary radiology, and Shannon Holmes, D.V.M., a veterinary radiology resident, aim to learn whether MRI provides the most effective imaging to determine if a dog has single or multiple shunts and the location. At the same time, they are investigating changes in the brains of dogs with PSVA since hepatic encephalopathy is responsible for some of the more serious clinical signs and is relatively poorly understood.

"For the diagnosing veterinarian and surgeon, decisions on the course of treatment are superior if they are based on an accurate and complete 3-D model of the blood's path," Holmes

Cocker Spaniel Owners Can Contribute to Research

Owners and breeders of Cocker Spaniels can help advance research of canine liver disease, and other health conditions, by:

- Participating in the American Spaniel Club Foundation's Cocker Spaniel Comprehensive Breed Health Survey. It only takes 20 minutes to complete the online survey. Results will be analyzed by researchers at the University of Wisconsin at Madison.
- Financially contributing to the chronic hepatitis study at the University of Wisconsin at Madison or the liver shunt research at Washington State University. Send contributions — be sure to earmark your gift for these studies — to Adrianna Grimes, secretary for the American Spaniel Club Foundation, 9214 Chisum Road, Justin, TX 76247.
- Sending DNA samples to the Cocker Spaniel DNA bank at the University of Missouri at Columbia. These samples will help to advance the research of Gary Johnson, D.V.M., Ph.D., associate professor of veterinary pathology, and other researchers who are studying a variety of health conditions in the breed. For information, visit www.asc-cockerspaniel.org/health/banking.asp.

says. "In the MRI study, we have shown that the path of the abnormal vessel is easily delineated and knowledge of the PSVA location reportedly reduces surgical time.

"There also have been a number of dogs suspected to have PSVAs based on clinical signs, such as blood values and abdominal ultrasounds, but the MRI has shown normal vasculature and no PSVA. It is the definitive distinction of these dogs that is important because they may not need to undergo full abdominal exploration."

The study, which is funded by the AKC Canine Health Foundation, involves comparing diagnostic imaging methods in 30 dogs, including one Cocker Spaniel. Among the imaging methods being studied are ultrasound and MRI. Studies at other institutions have focused on the use of nuclear scintigraphy, contrast portography and CT.

"All have different sensitivity and specificities, but MRI and CT have proved to be superior," Holmes says.

Nuclear scintigraphy is highly sensitive, but involves administering a radioactive agent and has relatively poor specificity. Portography uses iodinated contrast to produce a radiograph of blood vessels. Meanwhile, ultrasound uses high-frequency sound waves to look at organs inside the body, but its sensitivity is dependent on the sonographer in confirming the presence of a shunt.

One of two superior imaging methods for identifying PSVAs, CT scans produce a cross-sectional image that can be reconstructed into a 3-D image, but CT exposes an animal to radiation. In contrast, MRI produces a cross-sectional image using powerful magnets and radio waves to which protons in the body resonate.

"The goals of our study are to establish the accuracy and efficiency of MRI in the diagnosis of PSVA, delineate structural brain disease associated with hepatic encephalopathy, and determine if MRI can distinguish hepatic microvascular dysplasia, or surgically non-correctable microscopic

PSVA, from normal liver parenchyma," Holmes says. "Right now, we believe MRI is possibly the safest and best way to diagnose liver shunts."

Surgery offers the best chance for normal longevity in most dogs and is most successful when a dog has an extrahepatic shunt located outside the liver. Intrahepatic shunts, located inside the liver, can be difficult to repair and require cross-sectional imaging to accurately locate pre-operatively. Not all dogs are good candidates for surgery. The liver metabolizes some anesthetic agents, and surgery can put undue stress on an already metabolically unstable animal.

Surgery involves closing the abnormal pathway that causes the diversion of blood from the liver. "While surgery can be beneficial for dogs that have a single shunt, particularly those outside the liver, new research suggests some dogs can be managed medically," Holmes says. "Hopefully, our research will help to reduce unnecessary surgeries."

Since the genetic basis for chronic hepatitis and portosystemic vascular anomalies is not known, experts recommend not breeding dogs with either condition. By not breeding animals that may pass these conditions on to their offspring, breeders are helping to reduce the proliferation of liver disease. Meanwhile, research such as the study to find a quicker way of diagnosing chronic hepatitis and the one evaluating MRI for diagnosis of liver shunts offers promise in helping to reduce suffering and an untimely death due to canine liver disease. ■

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