

Love These Small Breed Dogs? Watch for These Signs of Liver Disease

These 8 breeds are at high risk of congenital liver disease, with 30% to 70% developing it. It's a worldwide problem affecting both genders. Even parents without the disease can produce puppies with it. Is your favorite pup at risk?

Analysis by [Dr. Karen Shaw Becker](#)

STORY AT-A-GLANCE

- Hepatic microvascular dysplasia, or HMD, is a condition in which tiny blood vessels inside the liver develop abnormally, disrupting blood flow, and compromising liver function
- HMD is a rare congenital disease that occurs in certain small-breed dogs
- Some dogs with the disorder have no symptoms and require no treatment. Clinical signs in symptomatic dogs include GI disturbances, small size, and poor muscle development
- Definitive diagnosis of HMD requires a liver biopsy. All dogs with the disease have abnormally high total serum bile acids
- Treatment depends on the severity of the condition and usually involves a reduced amount of high-quality protein in a biologically available form, and appropriate liver support supplements

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Your dog's liver is one of the most important organs in his body. It performs an impressive number of functions to maintain your pet's health, including filtering out toxins, making proteins, and storing sugar.

Most of the blood that travels to the liver to support these processes arrives in the portal vein, which drains the intestines, stomach, pancreas, and spleen. Inside the liver, the portal vein branches into many increasingly smaller vessels that transport blood throughout the tissues to each cell of the liver.

Hepatic Microvascular Dysplasia

Sometimes these tiny vessels develop abnormally in the liver, a condition called hepatic microvascular dysplasia (HMD). The blood vessel abnormality causes shunting (bypass) between the portal vein and circulation into the system. The blood vessel abnormality may be caused by minute lesions on the liver or irregular development or positioning of the vessels.

As a result of the malformations in the blood vessels, the blood doesn't flow to the liver as it should. The liver atrophies and can no longer process toxins or make the proteins necessary for the dog's growth and normal function.

Dogs at Risk for HMD

Hepatic microvascular dysplasia is a rare genetic disease that occurs in certain small breed dogs, including:

- Cairn, West Highland White, and Yorkshire Terriers
- Lhasa apso
- Maltese
- Shih tzu
- Tibetan and Cocker Spaniels
- Dachshund
- Havanese
- Miniature Poodle

Dogs of these breeds are affected worldwide and regardless of gender. Experts believe HMD may be caused by a dominant gene that doesn't affect every dog that carries it, since parents without the disorder can produce puppies with HMD. It may also be caused by more than one gene.

The incidence of HMD in certain small-breed dogs ranges from 30% to 70% and is typically diagnosed by the age of 4 to 6 months. The disease is nonexistent in large-breed dogs.

Symptoms of Hepatic Microvascular Dysplasia

Some dogs with HMD are asymptomatic (show no symptoms), but most do. When symptoms are present, they're often typical of a gastrointestinal disorder and include vomiting, loss of appetite, diarrhea, and lethargy.

In a dog with HMD and no symptoms, the disease is often discovered during routine diagnostic screening for another health issue. There is usually no history of problems, but occasionally an asymptomatic dog with the disease will have a delayed recovery from anesthesia or sedation, or show drug intolerance.

Dogs over 2 years of age who show symptoms have usually developed a liver shunt as a result of acute or chronic inflammation, tumors, or toxic liver disorder. Often a dog with HMD is 3 or 4 years old before clinical signs appear.

Some of these dogs are smaller than normal and have poor muscle development. They may also seem less alert than other dogs because unfiltered toxins depress brain function.

Along with GI disturbances, some dogs are also at greater risk for infections and **bladder stones**. Severely ill dogs may be wobbly on their feet, seem drunk or blind, and have seizures. Rarely, dogs will develop fluid-filled bellies from liver failure.

Diagnosing HMD

In some dogs with the disorder, basic bloodwork appears normal. However, severely affected dogs may have low blood protein, albumin, glucose, and urea nitrogen levels because their livers can't make a sufficient supply of these chemicals. Some dogs have increased liver enzyme values.

Urine is evaluated for the presence of infection and crystals. Once in a while a dog with HMD will develop ammonium biurate crystals in the urine that have distinct appearance.

Hepatic microvascular dysplasia is diagnosed using a total serum bile acids (TSBA) test. Any asymptomatic young dog with increased TSBA values or hepatic encephalopathy (damage to the brain and nervous system as a result of a liver disorder) is assumed to have HMD.

A definitive diagnosis is made by ruling out a liver shunt, and confirming the presence of abnormal vessels from a liver biopsy. Biopsies are usually performed through a surgical incision or with a laparoscope, which is my preference.

HMD must be differentiated from congenital portosystemic shunts, however, some dogs actually have both diseases simultaneously. Unfortunately, this can't be determined before surgery. A dog that undergoes surgery to close a congenital portosystemic shunt but still has high total serum bile acids a few months after surgery quite likely also has HMD.

To prevent overlooking HMD in a dog with a liver shunt, the liver can be biopsied while the dog is anesthetized for surgery to repair the shunt.

Treatment Options and Prognosis

Some dogs with hepatic microvascular dysplasia, especially asymptomatic dogs, traditionally don't require treatment, however they must be monitored for adverse reactions to drugs and anesthesia. I recommend providing dietary improvements and liver support for all patients suspected of having HMD to reduce as much liver stress as possible, which may provide an improved quality of life down the road.

Dogs who do need a detoxifying protocol are managed medically and treatment is focused on the severity of the condition.

Symptomatic HMD dogs must be transitioned to a diet that contains a reduced amount of high quality, highly digestible protein. Traditional veterinary recommendations are that the diet should contain about 15% to 20% protein, 15% to 30% fat, and 30% to 50% highly digestible carbohydrates on a dry matter basis.

And if pet owners are feeding a feed grade (not food grade, or human grade) extruded diet (dry kibble), this is recommended by the holistic community as well.

Feed grade canned and dry foods are made with lesser quality protein sources that have been extensively processed and are not as easily assimilable as human grade, high quality cuts of meat. Holistic practitioners, including myself, strongly recommend transitioning all pets struggling with impaired liver function to a home prepared, nutritionally balanced, and fresh food diet made with organic, non-GMO ingredients.

It's important the diet be balanced for pets struggling with liver impairment, which means the diet is low in copper and manganese, high in antioxidants, including vitamin E, and zinc.

The percentage of human grade, high quality protein provided will be based on how significant your dog's liver dysfunction is, but ranges from 25% to 50% protein, 20% to 35% fat, and 15% to 40% carbs/starches.

The diet of HMD dogs should be supplemented with a high quality probiotic that will be beneficial in decreasing toxin production and absorption in the intestines.

Other supplements I recommend include milk thistle, which not only improves liver function, but also helps regeneration, SAM-e for assisted detoxification, choline or lecithin, and glutathione or NAC (n-acetylcysteine) for cellular support. There are also many wonderful TCM (Traditional Chinese Medicine) and homeopathic remedies that can be selected and customized based on your dog's presentation.

Dogs with HMD-related brain and nervous system damage, and those with prolonged episodes of vomiting or diarrhea may need to be hospitalized to receive appropriate supportive care and diagnostic testing.

The prognosis is good for most dogs with HMD who can be successfully medically managed. Dogs with GI signs or seizures have a poorer prognosis. Occasionally, hepatic microvascular dysplasia progresses to liver failure.

Since HMD is a hereditary condition, dogs with abnormal total serum bile acids should not be bred, nor should dogs with parents who have abnormal TSBA test results.
