

Canine Breed-Specific Hepatopathies

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KEYWORDS

- Inherited • Congenital • Ductal plate • Portosystemic shunt • Chronic hepatitis
- Vacuolar hepatopathy

KEY POINTS

- Many canine liver diseases have reported breed predispositions, but the genetic cause is usually poorly understood.
- Most canine liver diseases are likely to be polygenic in inheritance and represent an interaction of genes and environment.
- Congenital portosystemic shunts and abnormalities of development of intrahepatic portal veins and ductal plates are likely inherited and probably underrecognized.
- Idiopathic chronic hepatitis in dogs shows strong breed relationships suggesting genetic causes in several breeds, but the reasons for this will vary between breeds.
- Vacuolar hepatopathies and gallbladder mucocoeles have also been demonstrated to have some breed relationships.

INTRODUCTION

Liver diseases, congenital and acquired and acute and chronic, are commonly recognized in a wide variety of pedigree dog breeds and crossbreeds. There are well-documented breed predispositions to many liver diseases, demonstrating an inherited tendency. In many cases, these are true breed predilections, but in some cases the claims have not been substantiated by comparison with a reference population (either a biased hospital reference population or less biased Kennel Club or insurance company data). It is important to do this before claiming increased breed prevalence because it is all too easy for false data to become established fact once they are published. Recent increased understanding of disease causes in humans and dogs shows that many inherited diseases represent a complex interaction between genetics and environment. Many diseases are polygenic, involving more than one gene together with environmental input. Even diseases inherited in an apparently simple Mendelian

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manner involving one gene can be affected by environment and may not be as simple as first thought (see discussion of copper storage disease later).

It is important for clinicians to be aware of breed predispositions for liver disease: this helps with diagnosis because it increases suspicion of disease, although it is also important to remember that not all dogs of that breed with liver disease will necessarily have the breed typical disease. Breed spotting is, therefore, not a substitute for a complete work-up, just an aid. Understanding breed predispositions will also, it is hoped, help us further to elucidate the cause of the diseases through genetic studies and, therefore, help us with more effective treatment as well as informing preventative strategies, now and in the future.

BREED-RELATED CONGENITAL LIVER DISEASES

Congenital portosystemic shunts (CPSS) are one of several congenital liver diseases outlined in Fig. 1, which encompass developmental abnormalities in hepatic vascular and ductal plate development of puppies in utero. There is some overlap between the diseases as detailed in Fig. 2 and even between isolated CPSS and ductal plate abnormalities in the liver as detailed later.

Congenital Portosystemic Shunts

CPSS are relatively common in dogs. A detailed discussion of CPSS is beyond the scope of this article and can be found in other sources, including *Veterinary Clinics of North America*, May 2015. The focus here is to summarize the evidence for inherited CPSS and the relationships between CPSS and other congenital vascular diseases of the liver. Extrahepatic CPSS are most commonly diagnosed in small-breed dogs and intrahepatic CPSS most commonly in large breed dogs. Strong breed associations are reported in the veterinary literature for CPSS, but there is also a geographic variation (Table 1).

Intrahepatic CPSS are common in Irish wolfhounds throughout the world and are most commonly patent ductus venosus, which should be on the left; but not all Irish wolfhounds with CPSS have this form on shunt. Krotscheck and colleagues¹ reported 125 dogs with intrahepatic CPSS from Australia and the United States. Five of these

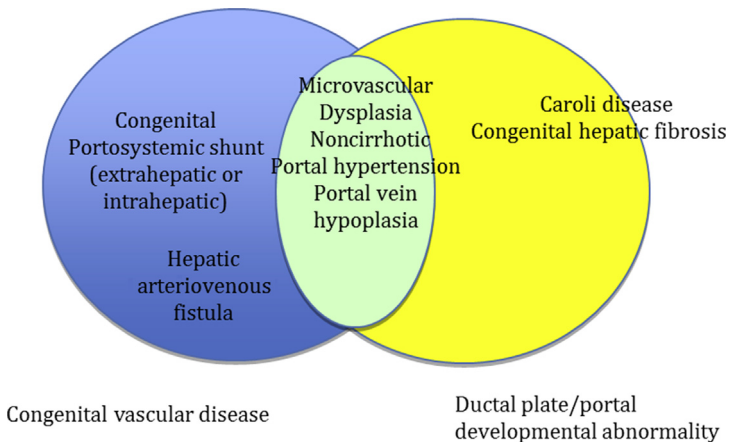


Fig. 1. Congenital liver diseases in dogs. Note that as well as overlapping syndromes, it is possible to have concurrent diseases, for example, congenital portosystemic shunt and microvascular dysplasia (see text for details).

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