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Polyneuropathy

Issue Description

Polyneuropathy in dogs and cats is a collection of peripheral nerve disorders that often are breed-related in these animals. Polyneuropathy indicates that multiple nerves are involved. Polyneuropathy usually involves motor nerve dysfunction.

Other Names

Lower Motor Neuron Disease

Breeds At Risk

The following breeds have the highest incidence of inherited polyneuropathy: Alaskan Malamutes, Boxers, Dalmatians, English Pointers, German Shepherds, Long-Haired Dachshunds, Rottweilers and Tibetan Mastiffs. Coonhounds have a higher rate of acquired neuropathy, even suffering from their own condition, known as coonhound paralysis.

Symptoms

Symptoms include decreased or absent reflexes and muscle tone, weakness, or paralysis. It often occurs in the rear legs and is bilateral. Most are chronic problems with a slow onset of symptoms, but some occur suddenly.

Diagnosis

A variety of blood, nerve and muscle tests are used to diagnose polyneuropathy in dogs. Inherited forms of the disease are incurable, so treatment is focused on making the dog as comfortable as possible.

Treatment

Dogs with acquired neuropathy can be treated based upon the specific cause; immune-suppressing drugs like corticosteroids are often prescribed. When the animal is severely disabled or unable to walk, nutrition, fluid and electrolyte therapy also may be administered. Animals that cannot walk also must be treated and moved regularly to prevent the development of bedsores.

Most Common Types of Polyneuropathy

- Birman Cat distal polyneuropathy - This is an inherited disorder caused by decreased numbers of myelinated axons in the central and peripheral nervous systems. Astrogliosis (an increase in the number of astrocytes) is also noted. The lesions are most commonly found in the lateral pyramidal tract of the lumbar spinal cord, the fasciculi gracili of the dorsal column of the cervical spinal cord, and the cerebellar vermal white matter. Symptoms start at the age of 8 to 10 weeks, and include frequent falling and walking on the hock. The prognosis is poor. The disease is suspected to have a recessive mode of inheritance.
- Botulism - Botulism is very rare in dogs and usually follows feeding on carrion. Symptoms include weakness, difficulty eating, acute facial nerve paralysis, and megaesophagus. Compared to other species, dogs and cats are relatively resistant to botulism.
- Dancing Dobermann disease - This primarily affects the gastrocnemius muscle in Dobermanns. It usually starts between the ages of 6 to 7 months. One rear leg will flex while standing. Over the next few months it will begin to affect the other rear leg. Eventually, the dog is alternatively flexing and extending each rear leg in a dancing motion. Dancing Dobermann disease progresses over a few years to rear leg weakness and muscle atrophy. There is no treatment, but most dogs retain the ability to walk and it is painless.

- Diabetic neuropathy - This condition is more common in cats than dogs. It is caused in part by prolonged hyperglycemia (high blood sugar) and results in dysfunction of one or both tibial nerves and a plantigrade stance (down on the hocks). It may resolve with treatment of the diabetes. The pathology of this condition in cats has been shown to be very similar to diabetic neuropathy in humans.
- Distal symmetric polyneuropathy - Symptoms include atrophy of the distal leg muscles and the muscles of the head, and rear limb weakness. There is no treatment and the prognosis is poor. This is most commonly seen in Chesapeake Bay Retrievers, St. Bernards, Great Danes, Newfoundlands, Collies and Labrador Retrievers.
- Dysautonomia - This is primarily seen in cats. Symptoms include vomiting, depression, not eating, weight loss, dilated pupils, third eyelid protrusion, sneezing, slow heart rate, and megaesophagus. There is a poor prognosis and supportive treatment is necessary. Cats can recover, but it may take up to one year.
- Giant axonal neuropathy - This is a rare disease in the German Shepherd Dog. It usually becomes evident between the ages of 14 and 16 months. Symptoms include rear limb weakness, decreased reflexes, muscle atrophy, megaesophagus, and loss of bark. There is no treatment and a poor prognosis.
- Hyperchylomicronemia or hyperlipoproteinemia - This is a type of hyperlipidemia that is inherited in cats. Polyneuropathy is caused by stretching or compression of nerves near bone by xanthomas, which are lipid deposits. It can cause Horner's syndrome, facial nerve paralysis, and femoral nerve, tibial nerve, radial nerve, trigeminal nerve, or recurrent laryngeal nerve paralysis.
- Hypertrophic neuropathy - This is also known as canine inherited demyelinating neuropathy (CIDN) and is inherited in the Tibetan Mastiff. Symptoms usually start between the ages of 7 to 10 weeks, and include weakness, decreased reflexes, and loss of bark. Sensory function remains, but there may be a poor gait or an inability to walk. There is no treatment and a guarded prognosis. It is inherited as an autosomal recessive trait.
- Hypoglycemia - Polyneuropathy is especially seen in conjunction with insulinoma.
- Myasthenia gravis
- Polyradiculoneuritis - This is inflammation of the nerve roots. The most common type is Coonhound paralysis. This is similar to Guillain-Barré syndrome in humans. Coonhound paralysis seems to be secondary to a raccoon bite, probably due to some factor in the saliva. However, it can also occur without any interaction with a raccoon. It can happen in any breed of dog. When associated with a raccoon bite, the symptoms start 7 to 11 days after the bite, and include rear leg weakness progressing rapidly to paresis, and decreased reflexes. When not associated with a raccoon bite, the same symptoms occur, with the paresis taking about 3-4 days to reach its maximum effect. Severe cases will have a loss of bark, trouble breathing, and an inability to lift the head. Typically the duration of the paralysis is 2 to 3 months. However, the paralysis can last up to 6 months. Treatment is proper nursing care, and the prognosis is good in mild cases. In bad cases the dog doesn't completely recover their initial muscular capability but still are able to live and enjoy life for years. In very bad cases it is possible for breathing to be impaired, and unless the dog is placed on a ventilator, suffocation will occur. Polyradiculoneuritis has also been seen one to two weeks post-vaccine in dogs and cats. It can also be caused by toxoplasmosis.
- Rottweiler distal sensorimotor polyneuropathy - This is characterized by distal muscle denervation, but the cause is unknown. It affects young adult Rottweilers. The symptoms include weakness of all four legs and decreased reflexes. The disease is gradually progressive. Treatment is possible with corticosteroids, but the prognosis is poor.
- Sensory neuropathies - These are inherited conditions in dogs and cause an inability to feel pain and a loss of proprioception. Self mutilation is often seen. There is no treatment, and the prognosis is poor in severe cases. There are several affected breeds.
 - Boxer - usually occurs at around two months of age as a slowly progressive disease.
 - Dachshund (longhaired) - usually occurs between 8 and 12 weeks of age, and causes urinary incontinence, loss of pain sensation all over the body, and penis mutilation. It is probably inherited as an autosomal recessive trait.
 - English Pointer - usually occurs between the ages of 3 and 8 months and most commonly involves licking and biting at the front paws. There is no treatment and a poor prognosis. It is inherited as an autosomal recessive trait.
- Spinal muscular atrophy - This occurs in dogs and is caused by the death of nerve cells in the spinal cord. This progressive disease has no treatment and a poor prognosis. Affected breeds include the Swedish Lapland Dog, Brittany Spaniel, English Pointer, German Shepherd Dog, Rottweiler, and Cairn Terrier.
- Tick paralysis - This is an acute, ascending motor paralysis that occurs in dogs; cats seem to be resistant. The cause is a neurotoxin in the saliva of certain species of adult ticks. Dermacentor species predominate as a cause in North America, while Ixodes mainly causes the disease in Australia. The onset of symptoms is 5 to 9 days after tick attachment, and include incoordination progressing to paralysis, changed voice, and difficulty eating. Death can occur secondary to paralysis of the respiratory muscles, but in North America

there is a good prognosis once the ticks are removed. Recovery is usually in 1 to 3 days. In Australia, however, it is a more severe disease with cranial nerve effects, and death can occur in 1 to 2 days.

- Toxic neuropathies - The most common causes are vincristine, thallium, and lead.

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