AVIAN BOTULISM

Office of Fish and Wildlife Health and Forensics

Introduction

Avian botulism is caused by a toxin produced by the bacterium *Clostridium botulinum.* Avian botulism is a paralytic disease and causes flaccid paralysis (Limber neck) which leads to death from respiratory or cardiac failure. This disease typically affects waterfowl but can affect most birds and some mammals.

Species Affected

Avian botulism affects primarily waterfowl and shore birds in the United States. Most birds and some mammals are susceptible to avian botulism.

Clinical Signs

The onset of clinical signs varies depending on which type of botulism they have ingested. Signs include weakness, inability to fly, paralysis of the skeletal muscle, and even respiratory issues. Typically, death occurs due to respiratory or cardiac paralysis.

Transmission

Birds become infected when they ingest the bacteria*, C. botulinum* or when they ingest prey or environmental material that has the toxin in it. Transmission can also occur through the carcass-maggot life cycle in which maggots accumulate toxins from dead infected birds which are then eaten by other healthy birds. *C. botulinum* spores are heat resistant and can exist in soil, river, and seawater. Transmission can also occur by the invasive goby fish which accumulates the toxin when feeding on decaying material. Spores can also germinate in the gut of stressed or deceased fish during the summer. When these fish die it provides *C. botulinum* with a source of food and anaerobic conditions in lakes during this time, continuing the life cycle.

Diagnosis

Blood or tissue sample is used to find the presence of the *C. botulinum* toxin.

Treatment

Antitoxin treatment of ducks and mink infected with type C toxin has often been successful.

Epidemiology

The causative agent of avian botulism is a toxin produced by *C*. *botulinum*. Seven toxins have been identified, only three of which are capable of infecting wild birds (C, D, E). Type A has been shown capable of affecting chickens. The spores produced by *C*. *botulinum* can persist in the environment for years through adverse conditions. Avian botulism is common near water or wetlands. A telltale sign of an avian botulism mortality event is lines of dead waterfowl near the water's edge. Around 10,000 to 50,000 birds are lost each year due to avian botulism. Die-offs from type C botulism typically occur during the summer and fall due to higher ambient temperatures and accumulation of the toxin in soil. Type E botulinum causes mortality of loons and ducks on the Great Lakes and is due to the invasive goby fish that accumulated the toxin when feeding.

Additional Information

Botulism | Cornell Wildlife Health Lab

Avian botulism (utah.gov)

Avian Botulism | U.S. Geological Survey (usgs.gov)

Cover Image: USFWS