



Neospora Caninum

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Summary

In this article, information about *Neospora caninum* parasite's general characteristics, history, life cycle (intermediate hosts and final hosts), classification, negative effects on animals, methods of diagnosis and clinical symptoms are given.

Introduction

It is a protozoan disease caused by *Neospora caninum* and seen in a wide lineage of vertebrate animals. *N. caninum* was first isolated from a dog's central nervous system in 1988. The presence of *Neospora caninum* has been detected in tissue samples stored since 1957 and it has been reported that it was misdiagnosed due to its similarity to *Toxoplasma gondii* in previous years.

Neospora is caused by the parasite *caninum* [1]. *Neospora* has been found in various species around the world. Abortions caused by *neosporea* are seen in cattle, sheep and dogs. Dogs and other canines (such as foxes) are home to parasites. Parasites reach sexual maturity and multiply in carrier animals.

Taxonomy

With the PCR studies of *Neospora caninum*, nucleotide sequences, DNA frequency and ribosomal RNAs were examined and classified as follows [2].

- **Phylum:** Apicomplexa Levine, (1970)
- **Class:** Sporozoa Leuckart, (1879)
- **Subclass:** Coccidia Leuckart, (1879)
- **Order:** Eimeriina Leger, (1911)
- **Family:** Sarcocystidae Poche, (1913)
- **Genus:** *Neospora*
- **Species:** *Neospora caninum*.

Clinical symptoms

Abortions between 3 and 9 months (especially between 5 and 7 months). Clinical symptoms have been reported only in calves younger than two months of age, and in congenital infections, calves may be born weak or premature. Rarely, clinical manifestations range from mild ataxia to tetraplegia, with hydrocephalus, exophthalmia and growth difficulties. On neurological examination, asymmetry, ataxia, decreased patellar reflex and conscious loss of proprioception are noticeable in the eyes. The mother does not have any symptoms. Abortions may occur again in the future in the mother [3].

Infection-related cow abortions and neonatal deaths have been reported in many countries; In the USA, New Zealand, the Netherlands and Germany, *N. caninum* infections are responsible for 12-42% of abortions in dairy cows [4].

Diagnosis

To make an accurate diagnosis of neosporosis, it is imperative to conduct a histological examination of the fetus. Although brain, heart, liver, placenta, body fluids or blood serum are used for the diagnosis of neosporosis, the most suitable material is the most suitable material because the fetal brain is the organ most affected by infection [5]. To detect *Neospora caninum* antibodies, ELISA, IFAT and *Neospora* Serological tests such as Agglutination Test (NAT) are used. Immunoblot can also elicit specific *N. caninum* antibodies [6].

Life cycle

The three infectious forms in the life cycle of *Neospora caninum*, the tachyzoite, bradizoite and oocyst form, play a fundamental role in the transport of the causative agent [7]. Although it is known that

dogs were the last hosts of *N. caninum* in experimental studies, it has been reported that wild carnivores, including foxes and coyotes, may also be the last host [8].

From the feces of dogs experimentally infected with tissue cysts of the parasite, 11.7x11.3 µm in size non-sporerated oocysts emerge [9]. Unspored oocysts released into the external environment with dog feces are sporadated in the external environment and taken by the intermediate host cattle, sheep, goats, horses or dogs with contaminated feed and water. Sporosides released in the intestine enter the intestinal epithelial cells and turn into tachyzoites in the intermediate host. Tachyzoites continue to spread extracellularly, either by moving between host cells or through the bloodstream. The tachyzoite stage, which is the stage that causes tissue damage, spreads the infection in the intermediate host and transmits it to the fetus by transplacental route, is the stage that divides rapidly. The tachyzoites in the cell in the intermediate host are transformed into bradizoites, which are the latent stage, and form tissue cysts, especially in the central nervous system (CNS). The biological cycle continues with the removal by dogs of tissue cysts in the placenta, aborted fetus or uterine wastes and other internal organs of the infected host. Cattle can become infected postnatally or congenitally. Postnatal infection of cattle occurs by ingestion of food and water contaminated by spored oocysts scattered around with feces from the last hosts. In this case, if the cattle is pregnant, transplacental infection may occur and abortion may occur. It is reported that since neosporosis is not carried venereal, it can't pass from a positive bull to a cow. The vertical route is the most common form of transmission of infection in cattle. Transmission in carnivores occurs by taking cyst forms of the parasite together with infected tissues. Abort fetus, placenta, and uterine waste are the most common source of infection for dogs.

The disease is not zoonoses, that is, it is not transmitted from animals to humans.

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