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Equine Piroplasmosis - A Brief Review

M. J. Desai[1]*, D. K. Parmar[2], G. M. Makwana[3] and G. G. Solanki[1]

[1]Veterinary Doctor, VSPCA Hospital, Vadodara, Gujarat-India

[2]Veterinary Doctor, Shree Supashva Jain Seva Mandal, Bhuj, Gujarat-India

[3]Veterinary Doctor, Shrimad Rajchandra Jivmaitri Dham, Dharampur, Gujarat-India

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Aetiology

Horses may get equine piroplasmosis (EP) from tick-borne parasites, namely the intraerytrocytic protozoan parasites Babesia caballi and *Theileria equi* of the Order Piroplasmida. Formerly known as Babesia equi, *Theileria equi* has been reclassified as a Theileria for its significant evolutionary, morphologic, biochemical, and genetic evidence.

Epidemiology

This illness affects horses and is spread by ticks; hence, it needs competent arthropod vectors to exist. Animals that have contracted the infection may carry the blood parasites for extended periods of time and serve as hosts for other tick infections. The introduction of carrier animals into regions with a significant amount of competent tick vectors may cause the disease to spread epizootically. Hosts - Horses, mules, donkeys and zebra

Life Cycle and Transmission

Red blood cells (RBCs) are invaded by Babesia sporozoites, which subsequently develop into trophozoites. These trophozoites then grow and divide into two merozoites, which can infect fresh RBCs and repeat the division process.

Horses bitten by ticks can contract *Theileria equi* sporozoites, which enter the lymphocytes and develop into intralymphocytic forms that eventually become Theileria-like schizonts. The merozoites released from these schizonts infect red blood cells (RBCs) and change into trophozoites, which then multiply and divide into pear-shaped tetrad (or "Maltese cross") merozoites.

Twelve species of Ixodid ticks belonging to the genera Dermacentor, Rhipicephalus, and Hyalomma have been found to carry B. caballi and T. equi transstadially; eight of these species are also capable of transovarially transmitting B. caballi infections. *Theileria equi* develops in the salivary glands of tick vectors and is not found in other tick organs; it is not transmitted transovarial from egg to larva. Babesia spp. are found in numerous tick vector organs and do transmit transovarial from egg to larva. Additionally, mechanical vectors tainted with infectious blood (such contaminated needles) may be a source of transmission.

Sources of infection

Blood contaminated with piroplasmosis-causing parasites and their related vectors

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(such as ticks and mechanical vectors). Animals with the infection may carry the blood parasites for extended periods of time and serve as tick vector sources of infection.

Clinical diagnosis

Equine piroplasmosis frequently presents with nonspecific clinical indications, making it easy to confuse the illness with other hemolytic illnesses that may cause fever, anemia, and jaundice. Compared to B. caballi, *Theileria equi* typically causes more serious illness. There are four different types of polio: acute, subacute, acute, and chronic. Rates of documented case fatalities range from 10% to 50%. In endemic environments, most animals recover from infection.

Peracute form

Rare form of disease with only clinical observation being moribund or dead animals.

Acute form

The most prevalent type of disease cases is defined by a fever that typically reaches 40°C, decreased appetite and malaise, increased respiratory and pulse rates, mucous membrane congestion, dark red urine production, smaller and drier-than-normal fecal balls, and anemic or icteric appearance in the affected animals.

Subacute form

Similar to the acute form, but with intermittent fever, weight loss in the affected animals, and mucous membranes that can range from pale pink to pink or pale yellow to bright yellow, petechiae and/or ecchymoses may also be visible. Normal bowel movements may also be slightly reduced, and the animals may exhibit mild colic symptoms.

Chronic form

Nonspecific clinical symptoms, such as mild inappetence, poor performance, and a decrease in body mass, are typically seen in chronic cases.

Laboratory diagnosis

Samples

Many thick and thin blood smears taken from the live animal's superficial skin capillaries when the disease was at its most acute (fever appearing); organ smears can be obtained during necropsy (cerebral cortex, kidney, liver, lung, and bone marrow). Blood or organ smear slides should be allowed to air dry before being fixed in methanol. Serum samples should also be collected.

Identification of the agent-
microscopic examination of blood

Using the Giemsa staining procedure, parasites are demonstrated in stained blood. Very low parasitaemia instances also use the thick blood smear technique. When co- infections between *T. equi and B. caballi* happen, it can occasionally be advantageous to accurately identify the parasite species. Serological approaches are recommended since blood smear testing is a difficult, imprecise, and impractical method of identifying horse piroplasmosis in carrier animals.

Serological tests

Indirect fluorescent antibody (IFA) test (a prescribed test for international trade)

The IFA test has proven to be effective in helping to differentiate between infections

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caused by *B. caballi and T. equi*. Strong positive reactions are easy to identify, but distinguishing between weak positive and negative reactions necessitates a great deal of interpretation skill. A comprehensive explanation of the IFA test methodology may be found in published sources, and the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals offers an example of an IFA protocol.

Enzyme-linked immunosorbent assay

High sensitivity and specificity have been demonstrated by indirect ELISAs employing recombinant *T. equi and B. caballi* proteins to identify antibodies in infected equines. Problems with antigen purity are solved by a competitive inhibition ELISA (C- ELISA), which uses recombinant protein and a particular monoclonal antibody (MAb) that defines the merozoite surface protein epitope. 94% correlation was demonstrated between the CELISA and the CF test in detecting antibodies to *T. equi*

Complement fixation (CF) test

Some countries have employed the CF test to certify horses for importation. However, not all infected animals may be detected by the test, particularly those that have received medication, exhibited anti-complementary reactions, or lacked the ability of IgG(T), the primary immunoglobulin isotype of equids, to fix guinea-pig complement. As a result, the CF test is no longer required for international trade in favor of the IFA and C-ELISA tests.

Treatment

Imidocarb- 2.2 mg/kg given IM, because imidocarb inhibits the enzyme cholinesterase, side effects from the medication may include perspiration, agitation, diarrhea, and/or colic. Effects can be prevented with an IV dose of glycopyrrolate at 0.0025 mg/kg once, or reversed with a single IV dose of atropine at 0.2 mg/kg.

Diminazene aceturate - 3.5 mg/kg IM every 48 hours (two treatments).

Oxytetracycline - 5 to 6 mg/kg, IV once daily for 7 days

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