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**Diagnosis of Babesiosis
(English Translation)**

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

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1 Scope

This standard specifies the basis, principles, diagnosis and differential diagnosis of Babesia.

This standard applies to the diagnosis of Babesia in medical institutions and disease prevention and control institutions at all levels.

2 Terms and definitions

The following terms and definitions apply to this document.

Babesia *Babesia.spp*

Protozoa that parasitize the red blood cells of humans and vertebrates. The main infections of humans are *Babesia microti* and *Babesia diversiformis*.

(*B.divergens*), Duncan *Babesia* (*B.duncani*), Orion *Babesia* (*B.venatorum*), etc. (see Appendix A).

Babesia babesiosis/babesiasis A type of zoonotic parasitic disease caused by *Babesia* infection is mainly transmitted by ticks.

Asymptomatic case

Babesia infection without clinical symptoms.

Severe babesiosis

A confirmed case of *Babesia*, high fever, severe anemia, jaundice, hemoglobinuria, respiratory distress, renal failure, coma, etc.

One or more clinical manifestations.

3.1 Epidemiological history

History of field activities, tick bites, blood transfusion or organ transplantation (see Appendix B).

3.2 Clinical manifestations

3.2.1

Common clinical manifestations. chills, fever, sweating, fatigue, nausea, loss of appetite, muscle pain, joint pain, headache, abdominal Pain, anemia, etc. (see C.1 of Appendix C).

3.2.2

Severe clinical manifestations. high fever, severe anemia, hemoglobinuria, jaundice, respiratory distress, renal failure, coma, etc. (see attached C.2) of C.

3.3 Laboratory inspection

3.3.1

See *Babesia* for blood smear microscopy (see D.1 of Appendix D).

3.3.2

Babesia nucleic acid test is positive (see Appendix D, D.2).

3.3.3

Babesia antibody test is positive (see D.3 of Appendix D).

3.3.4

Animals inoculated with Babesia are positive (see D.4 of Appendix D).

4 Principles of diagnosis

Diagnosis is based on epidemiological history, clinical manifestations, and laboratory test results.

5.1 Asymptomatic infection

There are no obvious clinical symptoms and signs, and it meets any of 3.3.1, 3.3.2 and 3.3.4.

5.2 Suspected cases

Comply with 3.1, and at the same time comply with any one of 3.2.

5.3 Clinically diagnosed cases

Suspected cases and also meet 3.3.3.

5.4 Confirmed cases

Clinically diagnosed cases or suspected cases, and meet any of 3.3.1, 3.3.2 and 3.3.4 at the same time.

5.5 Severe cases

The confirmed cases are in compliance with 3.2.2.

6 Differential diagnosis

The clinically diagnosed case should be compared with other diseases with fever as the main symptom, such as malaria, Lyme disease, tsutsugamushi, kala-azar, dengue fever, and abortion.

Distinguish the blood and other phases (see Appendix E).

Appendix A

(Informative appendix) Etiology A.1 Classification Babesia belongs to Apicomplexa

(Apicomplexa), Sporozoa (Sporozoa), Prioplasmasina (Prioplasmasina), Pear Piroplasmida (Piroplasmida), Babesiidae (Babesiidae), Babesia (Babesia). At present, more than 100 types of buses have been identified Shellworms can infect cows, horses, sheep, dogs and many other mammals and birds. The Babesia that can infect the human body is mainly the field mouse Babesia (*Babesia microti*), *B.divergens*, *B.duncani*, *B.venatorum*, etc.

A.2 Form

Babesia has various forms in red blood cells. Common worm body shapes are ring, round, rod, dot, pear, amoeba and so on. typical the form is pear-shaped, and there are often multiple parasites in one red blood cell, mostly with 1 to 4 parasites, which can form a triplet or quadruple type, namely Maltese cross shape; and can be worms of different developmental stages. After Wright or Gee's staining, the cytoplasm is blue and the nucleus is red. According to the body Size is divided into. large Babesia, body length 2.5 μm ~5 μm , such as Babesia divergent; small Babesia, body length 1.0 μm ~2.5 μm , such as field mouse Babesia.

A.3 Life history

The life history of Babesia mainly includes the developmental stages in the red blood cells of humans or vertebrates and the developmental stages in the body of the vector tick. Babesia Spores enter humans or vertebrates with saliva through tick bites, and after invading red blood cells, they develop through budding reproduction or two divisions.

Merozoites. With the rupture of red blood cells, the merozoites are released and then invade new red blood cells, repeating division and proliferation. Part of the body is no longer split Proliferate and develop into male and female gametophytes. The gametophyte enters the body of the tick by sucking the blood of the host, develops into the gametes in the intestine, and then combines They become zygotes, then proliferate, and then migrate to various tissues in the tick through hemolymph. The zygote that migrates to the tick's salivary glands further develops into the sporozoite completes a life cycle. The transmission methods of Babesia among ticks are as follows. (1)Transmission via eggs. After the female tick sucks blood, Babesia reproduces in the tick.

After reproductive development, it enters the ovary of the tick and is passed to the next generation of ticks via the egg. (2) Transmission during the period. after young ticks (or nymphs) suck blood containing Babesia Development, passing the worm to the next stage of development.

Appendix B

(Informative appendix) Epidemiology B.1 Source of infection Rodents such as humans and community rats, brown rats, yellow-breasted rats, and Apodemus agrarius, and animals such as cattle, deer, dogs, raccoons, and birds.

B.2 Ways of transmission it is spread through tick bites, blood transfusions, or organ