CANINE BABESIOSIS

Chirila Ramona*

*University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048 Oradea, Romania, e-mail:rpurge@yahoo.com

Abstract

Babesiosis is considered to be a hemosporidia defined, by most authors, as a non contageous parasitic disease, produced by piroplasma, a protozoan of the blood and/or lymphoid system, with endoglobular location, affecting the red cells of several species of vertebrates. Clinically, babesiosis is evolving through feverish access and hemolytic syndrome. Carnivores' babesiosis is a hemosporidia found in all Canis species, being of special interest for the countries of the Mediterranean basin, with lower prevalence in Western Europe. Transmission of the disease is carried out through Ixodidae ticks (9).

Key words *Babesiosis, disease, ticks,threats*

INTRODUCTION

Severity of clinical signs is closely related to the degree of replication of the parasite in red cells, the cell lysis produced and pathogenicity of the infective Babesia strain (1,2,3) .

Canine babesiosis may evolve under several clinical forms: acute, chronic and atypical.

In acute forms, following an incubation period of 4-6 days, appears the most important clinical sign of fever, accompanied by hemolytic syndrome. Consecutively, anorexia, deviation, polypnoea, tachycardia and haematuria occur. In 3-4 days after onset, hemolytic syndrome is obvious, by the pale mucous membranes due to anemia, which subsequently will degenerate in jaundice. Originally, bilirubinuria occur, that remains constant, followed by hemoglobinuria. Parasitemia usually occurs as the fever breaks, being inconsistent during fever and at the end.

Atypical cases are difficult to diagnose due to the extremely varied clinical picture. It often evolves with a hemolytic syndrome, Good accompanied by nervous, lung, digestive, ocular, vascular or lymphoreticular disorders.

Chronically cases are characterized by mild anemia, depression and bilirubinuria. Parasitemia is hard to identify in the peripheral blood.

In some cases less specific clinical signs were reported, such as bleeding. However, responsible for these situations may also be a co-infection with Ehrlichia canis. In addition, dehydration, low blood pressure,

weight loss, lethargy, abdominal pain, muscle tremors and sensitivity in the renal area were frequently reported.

In determining the diagnosis of babesiosis it is very important to have in mind the area dog comes from, the evolution of the disease in that area and the types of ticks found on the animal and in the environment.

Also, after clinical examination of the animal, the owner is asked to provide data as accurate as possible with regard to animal contact with the host vector, acaricides, acaricidal treatments applied, traveling in endemic countries and/or about any blood transfusions.

The season when the disease debuted has also a clinical significance in establishing the diagnosis. Thus, there was a greater prevalence of the disease in the wet season, when temperatures are not very high. The season of spring and autumn-winter is a peak period for canine babesiosis. This peak is in close connection with the season of ticks.

MATERIALS AND METHODS

The most simple and accessible method for canine babesiosis diagnosis is determining parasitaemia by classical means of coloring the peripheral blood smears. For this purpose, the blood sample on the anticoagulant or a fresh blood, not coagulated, is used, which will display on a blade and May Grùnvald Giemsa or Diff-Quik stained. Sometimes, the blood sample can be taken from the auricular pavilion or the base of the tail, some authors considering that on these places of choice one can identify a greater number of parasites (5,7,8).

On a clean and degreased blade, a drop of whole blood is put, on one of the edges. With a second blade, angled 30-40°, the drop of blood is extended to the opposite end of the blade. The surface of the blade is left to dry after which its staining is done either through the May Grùnvald Giemsa or through Diff-Quik method (4,6).

Stained blade is left to dry and then it is examined with an immersion objective (x 100). Parasites are mainly noticed at the stained display periphery. In the displayed blood stained the large babesioses (B. canis), appear as single or paired pyriform bodies, localized intraeritrocitary located, with a merozoite size of 4-5 μm. B. gibsoni, B. conradae and B. annae are identified as single intraeritrocitary bodies, circular-shaped, smaller than B. canis. Merozoites size does not exceed 1-3 μm to all small haemoparasites. Sometimes, parasites spotted intraeritrocitary may have a

Maltese cross shape. This method is widely used in veterinary medicine because of many advantages such as: simplicity, specificity and low costs. The method has the disadvantage that, in chronic cases, parasitemia may be hard to reveal, but the presence of the parasite in the smear is an absolute evidence of disease (10,12).

RESULTS AND DISCUTIONS

The experiment took place in a private veterinary clinic from Oradea, Vet clinic Oradea in the period starting from 15 january 2014 until 15 march 2014 and from the 20 dogs wich were tested for Babesia 9 of them were find positive. The dogs were out for a walk in the parc or on the green fields from Oradea.Imidocarb dipropionate (Imizol®, Carbesia®, Schering-Plough Animal Health) is administered intramuscularly or subcutaneously, intravenous route administration not being recommended. For dogs, the curative dose is 5.0-6.6 mg/kg, from 1-3 weeks, subcutaneously or intramuscularly administered. In the acute phase of babesiosis, the therapeutic response is fast, with a significant increase in number of red cells in 12-24 hours, and general clinical condition improvement in 48 hours in the absence of liver, kidney and/or vascular complications. This type of treatment was administered to animals with babesiosis, with very good results in several clinical and experimental studies. Medicinal product is active in infection with B. canis, less active infection with B. gibsoni and inactive in the infection with B. annae.

Occasionally, due to its anticolinesterase effect, side effects may occur such as: hypersalivation, tachycardia, dyspnea, vomiting and diarrhea. These effects can be reduced by administration of atropine (0.04 mg/kg), 10 minutes before injection with imidocarb.

Diminazene aceturate can be administered in cases of acute babesiosis in the dose of 3-5 mg/kg intramuscularly, in a single dose, in case of parasitism with B. canis and 7.5-10 mg/kg in the case of parasitism with B. gibsoni.

Doxycycline is an antibiotic often used in Europe for other diseases, but it has a beneficial effect in the treatment of babesiosis produced by B. canis and b. gibsoni in doses of 10 mg/kg, daily, for four weeks. The treatment is effective against the parasite, but it does not remove parasitemia (11,13).

Pentamidine is a derivative of diamine which is used in the treatment of canine babesiosis in a dose of 16,5 mg/kg, intramuscularly administered. Side effects seen after administration of the product are: vomiting, hypotension, local irritation and pain at the injection site.

Azithromycin and atovaquone are antibiotics used to treat various effective bacterial infections, but also in infections with Babesia gibsoni or Babesia annae, in doses of 10 mg/kg once daily for 10 days and 13 mg/kg every 8 hours for 10 days (14,16).

Clindamycin, in a dose of 25 mg/kg twice a day for 14 days, orally, reduces parasitemia and babesiosis symptoms produced by B. canis and B. Gibsoni (18).

Some authors claim that the chemotherapeutic medication used so far in the therapy of canine babesiosis do not completely remove the micro-organism from the animal's body, but only limits the severity of clinical signs and mortality. Thus, owners of animals must be informed that although the animal survived acute babesiosis, it will remain subclinical infected, with the possibility of the disease reoccurring in future. Also, dogs that have experienced the disease will remain sources of infection for animals from that area (15).

An important stage of treatment is supporting body therapy, therapy mainly aimed at the administration of intravenous fluids, blood transfusion, administering hepatorenal, antianemic and anticoagulants savers. Restoring electrolyte imbalance is made through administration of polyionic solutions such as: saline serum, Ringer serum, Ringer-lactate serum, Perfuzol, Duphalyte or glucosamine liquids of 5% or 10% (17,20).

Stimulating the organism reactivity with vitamins A, E, C (0.05-0.25-0.5-1 g/day), D3, along with proteinotherapy or blood transfusion from hyperimmunised donors represent other major targets.

Transfusion is recommended when the haematocrit is lower or equal to 15% and is mandatory when it drops below 10%.

CONCLUSIONS

To protect against babesiosis, dipropionate imidocarb in a dose of 5-6 mg/kg can also be used, intramuscularly or subcutaneously. A single administration ensures animal protection for four weeks.

In an experimental study, Doxycycline has been used at a dosage of 5 mg/kg, daily, during the period of exposure to infection with Babesia spp. It has been found that animals exposed to high pathogenic strains, even if they have not totally prevented the appearance of the disease, infested animals showed less severe clinical signs and the healing took place in about a week. The same prophylactic treatment, administered in the dose of 20 mg/kg, daily, prevented the emergence of the disease in animals experimentally infected with highly pathogenic strains.Chemoprophylaxis is used in canine babesiosis in case of dogs traveling in endemic areas for a short period of time, especially in splenectomized dogs,

immunocompromised individuals and dogs that have gone through an infection with Babesia spp. Chemoprophylactic treatment is administered a few hours before entering an endemic area.Currently, there are still no established strategic programs to control canine babesiosis worldwide. Risk of infection with Babesia spp. is very high, especially in dogs from endemic areas or in dogs traveling in these areas. This risk can be reduced through effective control of tick parasitism.

Disease prevention firstly is aimed at the destruction of ticks found on the animals' body through the use of acaricides. The most commonly used methods in controlling tick infestation are: application of acaricides in the form of collars, sprays or "spot-on" used individually on the animal. There are a wide variety of products that contain permethrin, amitraz, fipronil, imidacloprid or other acaricides (19,20,21,22).

REFERENCES

1.BIRKENHEUER, A.J., LEVY, M.G., BREITSCHWERDT, E.B. (2003). Development and evaluation of a seminested PCR for detection and differentiation of Babesia gibsoni (Asian genOtype) and B. canis DNA in canine blood samples. J. Clin. Microbiol., 41: 4172-4177.

2.BIRKENHEUER, A.J., LEVY, M.G., SAVARY, K.C., GAGER, R.B., BREITSCHWERDT, E.B. (1999). Babesia gibsoni infections in dogs from North Carolina. J.A.A.H.A., 35: 125-128

3.BIRKENHEUER, A.J., LEVY, M.G., SAVARY, K.C., GAGER, R.B., BREITSCHWERDT, E.B. (1999). Babesia gibsoni infections in dogs from North Carolina. J.A.A.H.A., 35: 125-128

4.BOOZER, L., MACINTIRE, D. (2005). Babesio gibsoni: An Emerging Pathogen in Dogs. Compend. Contin. Educ. Pract. Vet., 27(1): 33-41

5. BOURDOISEAU, G. (2006). Canine babesiosis in France. Vet. Parasitol., 138: 118-125.

6. CARDOSO, L., COSTA, A., TUNA, J., VIEIRA, L., EYAL, O., Y1SASCHAR-MEKUZAS, Y., BANETH, G. (2008). Babesia canis canis and Babesia canis vogeli infections in dogs from northern Portugal. Vet. Parasitol., 156: 199-204

7. CASSINI, R., ZANUTTO, S., FRANGIPANE DI REGALBONO, A., GABRIELLI, S., CALDERINI, P., MORETTI, A., TAMPIERI, M.P., PIETROBELLI, M. (2009). Canine piroplasmosis in Italy: epidemiological aspects in vertebrate and intervertebrate host. Vet. Parasitol., 165: 30-35

8. DANTAS-TORRES, F., AGUIAR-FIGUEREDO, L. (2006). Canine babesiosis: A brazilian perspective. Vet. Parasitol., 141:197-203

9. DĂRĂBUŞ GH., OPRESCU, I., MORARIU, S., MEDERLE, NARCISA (2006). Parazitologie şi boli parazitare. Ed. Mirton, Timişoara

10. DUH, D., TOZON, N., PETROVEC, M., STRASEK, K., AVSIC-ZUPANC, T. (2004). Canine babesiosis in Slovenia: molecular evidence of Babesia canis canis and Babesia canis vogeli. Vet. Res., 35: 363-368
11. GOTHE, R., WEGERDT, S. (1991). Babesia infections of dogs in Germany: epidemiological surveys. Tierarzt Prax., 19: 170-173
12. HORNOK, S., EDELHOFER, R., FARKAS, R. (2006). Seroprevalence of canine babesiosis in Hungary suggesting breed predisposition. Parasitol. Res., 99: 638-642
13. ILIE, M.S., DĂRĂBUŞ, GH., IMRE, MIRELA, IMRE, K., HOTEA, IONELA, SORESCU, I.D. (2010). Survey of canine babesiosis in Banat area. In Bulletin UASVM - CN, Vet. Med., 67: 125-130
14. IMRE, M., ILIE, M.S., MORARIU, S., IMRE, K., HOTEA, I., DĂRĂBUŞ, G. (2011a). Seroprevalence of B. gibsoni infection in western Romania. Abstracts / Curr. Opin. Biotech. 225, S15-5152 pp S112
15. IMRE, M., ILIE, M.S., MORARIU, S., HOTEA, I., IMRE, K., DĂRĂBUŞ, G. (2011). Epidemiosurvey by imunoflourescence of Babesia canis in dogs from Banat region. Lucr. Şt. Med. Vet. XLIV (1): 89-93
16.IRWIN, J. P. (2009). Canine babesiosis: from molecular taxonomy to control. Parasit. Vectors, 2:54. JACOBSON, L. (2000). The South African form of severe and complicated canine babesiosis: Clin.I Adv. 1994-2004. Vet. Par., 138: 126-139
17. JEFFERIES, R., RYAN, U.M., JARDINE, J., BROUGHTON, D.K., ROBERTSON, I.D., IRWIN, P.J. (2007). Blood, bull terriers and babesiosis: further evidence for direct transmission of Babesia gibsoni in dogs. Aust. Vet. J., 85: 459-463
18. KJEMTRUP, A.M., KOCAN, A.A., WHITWORTH, L., MEINKOTH, J., BIRKENHEUER, A.J., CUMMINGS, J., BOUDREAUX, M.K., STOCKHAM, S.L., IRIZARRY-ROVIRA, A., CONRAD, P.A. (2000). There are at least three genetically distinct small piroplasms from dogs. Int. J. Parasitol., 30: 1501— 1505.
19. KJEMTRUP, A.M., WAINWRIGHT, K., MILLER, M., PENZHORN, B.L., CARRENO, R.A. (2006a). Babesia conradae, sp. nov., a small canine Babesia identified in California. Vet. Parasitol., 138: 103— 111
20. Marius Ilie, Kálmán Imre, Ionela Hotea, Mirela Imre, ”Patogeni ai sângelui în continuă expansiune
21. MATIJATKO, V., KIS, I., TORTI, M., BRKUACIC, M., KUCER, N., BARIC, RAFAJ, R., GRDEN, D., ZIVICNJAK, T., MRUAK, V. (2009). Septic shock in canine babesiosis. Vet. Parasitol., 162: 263-270
22. MATIJATKO, V., MRUAK, V., KIS, I., KUCER, N., FORSEK, J., ZIVICNJAK, T., ROMIC, Z., SIMEC, Z., CERON, J.J. (2007). Evidence of an acute phase response in dogs naturally infected with Babesio canis. Veterinary Parasitology, 144: 242-250