



A Case of Babesiosis in German Shepherd Dog

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Abstract

Reports on diverse cases brought from Abia and Imo States that were treated in Veterinary Teaching Hospitals (VTH) revealed the prevalence of haemoparasites of different species having the same vectors in various geographical locations. In VTH, University of Nigeria, Nsukka, Trypanosomiasis dominated various infections presented and ticks were seen as prominent vectors on the body of the animals. However, in VTH, Michael Okpara University of Agriculture, Umudike (MOUUAU) tick borne babesiosis was mostly encountered and German shepherd dogs were the most susceptible. A female German shepherd dog was presented to the VTH, MOUUAU on 14th of May, 2025; it was observed to be weak and lacked appetite. The clinico-physiological examination revealed that the dog was febrile (40°C), had a body weight of 24 kilograms, a pulse rate of 100 beats per minute (bpm) and a respiratory rate of 24 cycles per minute (cpm). The dog had a heavy burden of brown tick infestation and the oral mucous membrane was very pale (paper white) while prescapular lymph nodes were swollen. Peripheral blood was collected in sample bottle with heparin as an anticoagulant for blood smear and haematology. Microscopic examination of the blood smear revealed the presence of pear-shaped piroplasmic organisms in some red blood cells. Moreover, the erythrocyte indices revealed that the dog was anaemic having low packed cell volume (PCV) of 31% (normal range: 35-57%) and haemoglobin (Hb) of 6.5 g/dl (normal: 11.9-18.9 g/dl). Differential white blood cell count revealed that the neutrophils (69%), monocytes (3%), eosinophils (2%), and basophils (0%) were normal. However, there was abnormally high lymphocyte (26%) against the normal range of 8-21%. The persisting normal plasma concentration of neutrophils indicated that this case was not complicated with bacterial infection.

Keywords: Babesiosis, Haemoparasites, Prevalence, Trypanosomiasis, VTH

Introduction: Weakness in dogs may be caused by infectious diseases, anaemia, trauma, poisoning or even medications. Babesiosis, a tick-borne disease, can affect German shepherd dogs, manifesting in symptoms such as lethargy, loss of appetite, fever, and pale gums. In some cases, it can lead to more severe symptoms, including jaundice, dark urine, and enlarged lymph nodes or spleen. Early diagnosis and treatment are crucial for managing the disease, which can be fatal if left untreated [1], [2].

Canine Babesiosis commonly known as malignant jaundice or tick fever, is a major disease of dogs world-wide [3]. The major species of *Babesia* found in dogs in Nigeria are: *Babesia canis* and *Babesia gibsoni*. *Babesia* replicates intracellular in red blood cells. The common vector for babesiosis is brown ticks (*Rhipicephalus sanguineus*) found on dogs [4].

The mode of infection involves a tick carrying *B. canis* sporozoites which attaches to a dog and feeds on its blood, releasing many sporozoites into the dog's bloodstream [5]. Each sporozoite attaches to a red blood cell and moves inside the cell. Once inside the cell, the sporozoite loses its outer coating and divides, becoming a new form, known as a merozoite. Inside the tick, the merozoite undergoes sexual reproduction (gamogony), and followed by asexual reproduction, resulting in many sporozoites. The merozoites are found in the salivary glands of ticks, from where, they get transmitted to infect another

dog and continue to feed through sucking the blood of its host [6],[7],[8].

Although, in most cases, *B. canis* is transmitted to dogs through the bite of an infected tick, some studies suggested that infected dogs with open-mouth sores can pass on the infection to other dogs through a bite. Furthermore, there is evidence of trans-placental transfer [9]. In complicated *Babesia* infections, there may be development of systemic inflammatory response, secondary bacterial infections, and multiple organ dysfunction syndrome [10].

The purpose of this case report is to report the prevalence of Babesiosis in German shepherd dogs found in Abia and Imo states with clinical and laboratory examination performed and to advice clinicians to ascertain the cause of haemoparasitism before treatment in order to avoid misdiagnosis, wrong therapy and consequent adverse drug reactions including hypovolemic shock.

Case Report: A female German shepherd dog of 2+ years was presented to Veterinary Teaching Hospital, Michael Okpara University of Agriculture, Umudike on the 14th of May 2025. The owner resides in Owerri with the dog. The dog was weak and demonstrated inappetence. Vaccination history was not up to date. Clinical examination revealed that the dog was febrile (40°C), had a body weight of 24 kilograms, pulse rate of 100 beats per minute (bpm) and respiratory rate

of 24 cycles per minute (cpm). The dog had a heavy burden of brown tick infestation, mucous membranes were observed to be very pale (paper white) and prescapular lymph nodes were swollen.

Peripheral blood was collected in sample bottle containing heparin as anticoagulant for blood smear and haematology. The examination of the blood smear using D-10 research microscope (China), connected to a laptop for view and capture revealed the presence of pear-shaped piroplasmic organisms in some red blood cells (Plate 1).

Moreover, erythrocyte indices revealed that the dog was anaemic and had low packed cell volume (PCV) of 31% and haemoglobin (Hb) of 6.5g/dl. Differential white blood cell count revealed that the neutrophils (69%), monocytes (3%), eosinophils (2%), and basophils (0%) were normal. However, there was abnormally high lymphocyte (26%) count (lymphocytosis).

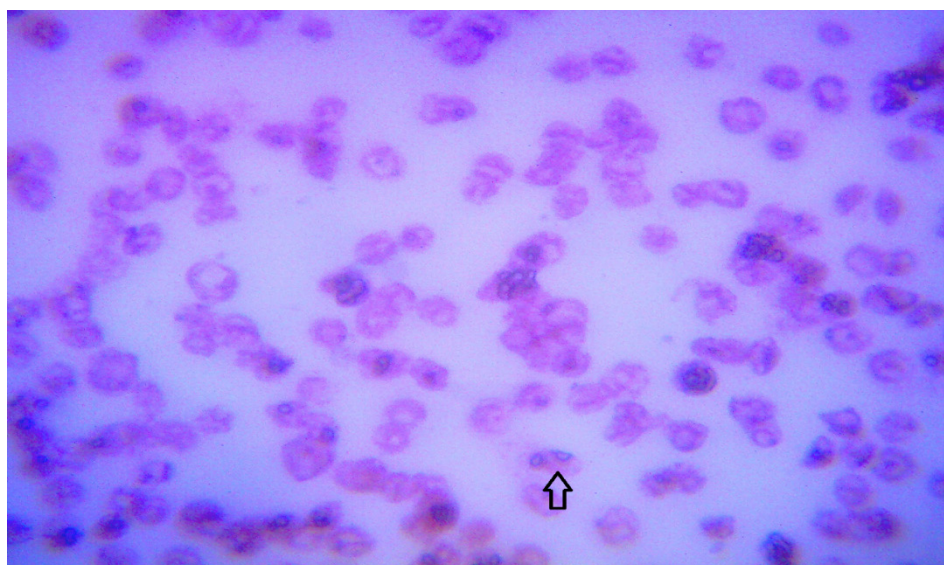


Plate 1: Photomicrograph showing ↑ Babesia in red blood cells of the German shepherd dog.

Diagnosis

Anaemia due to Babesiosis (haemoparasitism)

Case Management: Two millilitres (ml) of iron dextran with a dose of 0.2-2.5 ml per animal was given intra muscular (i.m.) to induce haemopoietic centre to actively build blood cells. The dose was repeated after 7 days. Ivermectin with a dose of 0.4 mg/kg was also given i.m. against the blood sucking ticks, to be repeated after 14 days. Doxycycline 10 mg/kg for 3 days was injected intramuscularly and imidocarb 0.05 ml/kg and repeated at 2 weeks were administered to target Babesia organisms. Furthermore, Vitamin B-Complex 1ml/10 kg was given sub-cutaneously for 3 days to enhance the appetite of the dog. Moreover, an anti-hista-

mine (Clomethazol) with a dose of 0.2 mg/kg was given sub-cutaneous to ameliorate any reaction that may ensue due to iron dextran injection.

The owner was advised to use acaricide to get rid of the tick vectors from his house and to feed the dog with nutritious diets rich in protein to promote haematopoiesis in the dog. During fumigation of the environment with acaricide, the dog was to be housed in a clean environment devoid of ticks or exposure to the acaricide.

A follow-up on the case showed that the dog still remained febrile, the pulse rate increased from 100 to 160 bpm and respiratory rate also increased from 24 to 36 cpm. Imidocarb dipropionate at a dose of 3 mg/100 kg was given sub cutaneous to limit the spread and infectivity of *Babesia* in blood. The treatment was repeated after 14 days. Piroxicam at a dose of 0.3 mg/kg was also given intra muscular to forestall any side effect that may arise due to Imidocarb therapy. The prognosis was good. The animal recovered after treatments.

Discussion

In differential diagnosis, febrile temperature and inflamed lymph nodes could be due to bacterial, viral or protozoan infection. However, differential white blood cells which revealed normal neutrophil showed that there was no complication of bacterial origin. Intracellular haemoparasites which could be *Babesia* (++) or *Theileria* were identified.

Babesia and *Theileria* have the same vectors, both lead to anaemia and have almost the same clinical signs. However pear-shape of the intracellular parasites confirmed the infection as due to *Babesia* organisms.

The increased respiratory rate, temperature and pulse rate after treatment with haematinics was an indication that haemopoietic centre had been successfully stimulated to start production of blood cells to ameliorate the anaemic condition. Imidocarb inhibits the proliferation of *Babesia* parasites, and thereby limits its spread from one cell to another [11].

Diminazene aceturate could also be used to treat the protozoan infection as well as Imidocarb. However, Diminazene is very toxic and acts directly on the parasite and host cells alike giving rise to unwanted side effects. It is therefore best suited for use against extra-cellular protozoan parasites such as Trypanosomes. However, this case report revealed intracellular parasite which if they are to be destroyed will cause the death of the cells where they are located leading to hypovolemic shock. Therefore, Imidocarb dipropionate became the drug of choice in order to achieve a good therapeutic outcome.

This case tends to highlight the need for clinicians to differentiate the specific haemoparasite involved, whether extra-cellular (Trypanosome) or intracellular (*Babesia*) before treatment in order to make informed decision on the best therapeutic approach to undertake.

Conclusion

It is expected that a timely presentation, diagnosis and proper treatment of cases of Babesia infections brought to the VTH, Michael Okpara University of Agriculture, Umudike would reduce incidence of case fatalities from the disease in Abia, and Imo states of Nigeria. This report agrees with the findings of Obeta *et al.*, 2020 [12] who reported the prevalence of asymptomatic babesiosis in Federal Capital Territory (FCT), Abuja, Nigeria.

References

1. Ganesan, P. I., Shekhawat, S. and Sharma, M. (2024). Studies on pathophysiology of Babesia gibsoni infection in Pakistani Bully, Shih Tzu, German shepherd dogs and Laborator dogs. *International Journal of Veterinary Sciences and Animal Husbandry*, 9: 582-585.
2. Yousaf, A., Yasoob, T. B., Bilal, M., Anwar, D. M., Ghaffar, A., Sana, Lodhi, M. K. and Habib, F. (2024). Diagnosis and treatment of canine babesiosis in a female German shepherd dog in Tandojam, Pakistan. *Journal of Animal & Plant Husbandry*, 4 (1): 1031-1035.
3. Okonkwo, A. R., Uchendu, C., Idoga, E. S., Gurumyen, G. Y. and Madubueze, J. S. (2024). Management of babesiosis in a Nigerian local breed of dogs: A clinical case study. *Journal of Research in Veterinary Science and Medicine*, 5: 2.
4. Kalita, M. K. and Patowary, P. (2024). Infections in dogs and cats. In: Principles and Practices of Canine and Feline Clinical Parasitic Diseases. John Wiley and Sons, USA: 119-131.
5. Gboeloh, L. B., Wagbara, B. N. and Sunday, B. B. (2023). Prevalence of Babesia Spp. In Presumably Healthy Dogs and Associated Risk Factors in OBIO/AKPOR Local Government Area. Rivers State, Nigeria. *Journal of Applied Veterinary Sciences*. 8: 89-97.
6. Martin, R. J., Robertson, A. P. and Choudhary, S. (2021). Ivermectin: an anthelmintic, an insecticide and much more. *Journal of Trends in Parasitology*, 37: 48-64.
7. Karasova, M., Tothova, C., Grelova, S. and Fialkovicova, M. (2022). Incidence, pathogenesis, diagnostics and treatment of canine babesiosis caused by Babesia gibsoni infection. *Journal of Animals (Basel)*, 12: 739.
8. Nehra, A. K., Kumari, A., Moudgil, A. D and Vohra, S. (2023). Parasites in the Cardiovascular System In: Organ-specific Parasitic Diseases of Dogs and Cats. Academic Press, United States: 53-58.
9. Jasik KP, Kleczka A, Franielczyk A. (2024). Histopathological Aspects of the Influence of Babesia microti on the Placentas of Infected Female Rats. *Journal of Veterinary Sciences*, 11:18.
10. Albakri, H. S., Aziz, K. J., Ismael, S. S. and Nasrullah, O.J. (2024). Microscopical and molecular diagnosis of canine babesiosis in stray dogs in Ebril, Iraq. *Journal of Veterinary Sciences*, 38: 823-830.

11. Schwint, O. N., Ueti, M. W., Palmer, G. H., Kappmeyer, L. S., Hines, M. T., Cordes, R. T., Knowles, D. P. and Scoles, G. A. (2009). Imidocarb dipropionate clears persistent *Babesia caballi* infection with elimination of transmission potential. *Journal of Anti-microbial Agents and Chemotherapy*, 53 (10): 4327-4332.
 12. Obeta, S. S., Ibrahim, B., Lawal, I. A., Natala, J. A., Ogo, N. I. and Balogun, E. O. (2020). Prevalence of babesiosis and their risk factors among asymptomatic dogs in Federal Capital Territory, Abuja, Nigeria. *Journal of Parasite, Epidemiology and Control*, 11: e00186.
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