Case Study of Canine Monocytic Ehrlichiosis (CME) in Pomeranian Dog at PDHB drh. Cucu K. Sajuthi

J G E Syaputra¹, C K Sajuthi², T P Sajuthi², Herlina², F S Permata³, W Purwatiningsih¹

¹Study Program of Veterinary Medicine Profession, Faculty of Veterinary Medicine, Brawijaya University, Malang, East Java, Indonesia
²PDHB drh. Cucu K. Sajuthi, Jakarta
³Department of Veterinary Anatomic Pathology, Faculty of Veterinary Medicine, Brawijaya University, Malang, East Java, Indonesia

*Email: drh.fajar@gmail.com

Abstract. Canine monocytic ehrlichiosis (CME) is tick-borne disease of worldwide distribution. The major causative agent is Ehrlichia canis, a gram negative, obligate intracellular, pleomorphic bacterium of the genus Ehrlichia, which infects monocytes, macrophages and lymphocytes. This study aims to understand the diagnostic approach and therapeutic of CME in Pomeranian dog. The examination methods used were physical examination, complete blood count and blood chemistry, urynalisis, X-ray, and E. canis/anaplasma ab test kit. The result of physical examination found dehydration (CRT>2), bruises in the neck area, bleeding in the gums, dyspnoea, and thick infestation. CBC, blood chemistry, and urynalisis test result showed anemia, severe thrombocytopenia, hypoproteinemia with hypoalbuminemia, and renal azotemia. The result of x-ray examination show the fluid aqumulation in thorax cavity. The result of E.canis/anaplasma ab test kit revealed positive result of E.canis. The dog was diagnosed with canine monocytic ehrlichiosis (CME). The dog was treated by antibiotic, hemostatic, and antiemetic.

1. Introduction
Parasitic disease is the most common problem found in dogs. This disease is caused by parasites, both ectoparasites and endoparasites. The occurrence of zoonotic parasitic diseases can be transmitted through tick bite, fleas, and mosquitoes. The research in Baharkam National Police Headquarters, Depok, reported that the prevalence of tick infestation in dogs was 67.90% with 8% Babesiosis and 12% Ehrlichiosis cases, while at Atang Sanjaya Air Force Air Base, Bogor, the prevalence of 100% tick infestation with 16% Anaplasmosis cases and 40% Ehrlichiosis [1].

Ehrlichia canis was the first species recognized to infect dogs and is the principal cause of canine monocytic ehrlichiosis (CME). After an incubation period of 8-20 days, the course of E. canis infection, can be sequentially divided into acute, subclinical and chronic phases, although these phases can hardly be distinguished in the clinical setting. Immunocompetent dogs may eliminate the infection during the acute or subclinical phases, but an unpredictable proportion of dogs will eventually develop the chronic phase, characterized by aplastic pancytopenia and high mortality, due to sepsisemia and severe bleeding [2].

2. Case Presentation
Gery, a 10 years male Pomeranian Dog presented with history of anorexia, lethargy. Physical examination revealed pale mucose, dehydration, bruises in the neck area, bleeding in gums, dyspnoea, and thick infestation. Complete blood count (CBC), blood chemistry, and urynalisis test revealed anemia (decreased of RBC, Hb, and HCT), severe thrombocytopenia, lymphopenia, hypoproteinemia with hypoalbuminemia, and renal azotemia. X-ray examination of thorax regio shows accumulation of fluid in thorax cavity (Figure 1). E.canis/Anaplasma Ab Test Kit show positive result for E.canis antibody (Figure 2).
3. Discussion

Based on the results of the problem oriented approach (POA), there is a possibility of differential diagnoses of chronic kidney disease, Immune-Mediated Haemolytic Anemia (IMHA), Immune-Mediated Thrombocytopenia (IMT) and blood parasite infection (Babesia sp., Ehrlichia sp., Anaplasma sp). After that, follow up examination such as complete blood count, blood chemistry and urynalisis test was performed. From these examinations the dog had anemia, severe thrombocytopenia, hipoproteinemia with albuminemia, and renal azotemia.

After CBC, blood chemistry, and urynalisis, examination with E.canis/Anaplasma ab test kit was performed, The E.canis/Anaplasma ab rapid test show positive results for E.canis antibody, so the dog was diagnosed with canine monocytic ehrlichiosis. Antibodies will bind and form the interpretation of the results in the form of lines on the test line and control line.

Thrombocytopenia is the most frequent hematological abnormality in CME, appearing in more than 80% of the cases, regardless of the phase of the disease [2]. Thrombocytopenia can be caused by impaired spinal cord production, excessive use/ destruction, sequestration and excessive loss. Production disorders due to acute renal failure, immune mediated disease, drugs, infectious agents, disseminated intravascular disease (DIC), septicemia, endotoxemia, and the release of procoagulant substances. A non-regenerative anemia, leukopenia, neutropenia (mild-to-moderate leukocytosis/neutrophilia with or without a mild left shift may rarely be seen) and lymphopenia or mild lymphocytosis are additional abnormalities [3].

The dog was treated by doxycycline 5 mg/kg, 2. dd. 1, orally, for 3 weeks), ethamsylate (10 mg/kg, 2. dd. 1, orally), ondansentron (0.1-0.2 mg/kg, 2 dd, intravenously), methylcobalamin, azodyl®, and ringer lactate intravenous infusion. Doxycycline enters microorganisms either through passive diffusion, through hydrophilic channels formed by porins, or by energy-dependent active transport processes. In E.canis, they bind to the ribosomal subunit in the 30's so that it inhibits the binding of aminoacyl-tRNA to the acceptor site of the ribosomal mRNA complex, inhibiting the protein transcription process. So as to prevent replication of E.canis [4].

Tick control with careful manual removal or by applying appropriate acaricides on a year-round basis, is the single most important measure for the prevention of E.canis infection. Importantly, it was recently shown that E.canis transmission may start a few (3-8) hours after tick attachment. Tick control products

such as those containing phenylpyrazoles (pyriprol, fi pronil), pyrethroids (permethrin, deltamethrin, tetramethrin, flumethrin), nitraz and isoxazolines (fluralaner, sarolaner, afoxolaner) have been shown to be very effective in reducing the incidence of E.canis infection and/or tick infestation, but the owners
should be aware that no product can completely prevent the infection in all dogs, under all circumstances [5].

4. Conclusion
Based on the anamnese, physical examination, and follow up examinations, this dog was diagnosed by chronic canine monocytic ehrlichiosis (CME). The dog was treated by doxycycline, ethamsylate, ondansentron, methylcobalamin, azodyl®, and ringer lactate intravenous infusion. The dog did not survive after 2 days hospitalization.

Acknowledgment
We thank PDHB drh. Cucu K. Sajuthi, Sunter, North Jakarta who provide place, facility, insight, and expertise that greatly assisted the preparation of this case study.

References
[1] Hadi U K, Soviana S and Pratomo I R C 2016 J. Vet. Sci. Tech. 7 1-7.
[2] Mylonakis M E and Theodorou K N 2017 Acta. Vet.-Beograd. 67 299-317.
[3] Gianopoulos A, Mylonakis M E, Theodorou K and Christopher M M 2016 Vet. Clin. Pathol. 45 281-90.
[4] Monsalve S B, Vanessa G L, Victor M M and Juan R G 2017. Pharmacokinetics and adverse effects of doxycycline in the treatment of Ehrlichiosis: theoretical foundations for clinical trials in canines. Thesis. University of Cordoba.
[5] Burgio F, Meyer L and Armstrong R 2016 Parasite Vectors. 9 626.