UNIVERSITI PUTRA MALAYSIA

A RETROSPECTIVE STUDY ON ANAEMIA IN CATS PRESENTED TO THE UNIVERSITY VETERINARY HOSPITAL, UNIVERSITI PUTRA MALAYSIA FROM THE YEAR 2015

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A RETROSPECTIVE STUDY ON ANAEMIA IN CATS PRESENTED TO THE UNIVERSITY VETERINARY HOSPITAL, UNIVERSITI PUTRA MALAYSIA FROM THE YEAR 2015

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CERTIFICATION

It is hereby certified that we have read this project paper entitled "A Retrospective Study On Anaemia In Cats Presented To TheUniversity Veterinary Hospital, Universiti Putra Malaysia From The Year 2015" by Raquel Yong Li Hui and in our opinion it is satisfactory in terms of scope, quality, and presentation as partial fulfillment of the requirement for the course VPD 4999- Project

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DEDICATIONS

This project is dedicated to the One Almighty God, who created me and made all things possible,

To my family,

Father

Mother

Sisters: Lydia, Fiona and Elaine

& Snowy

And to all my lecturers who have committed themselves towards the noble cause of education

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ABSTRAK

KAJIAN RETROSPEKTIF TERHADAP ANEMIA PADA KUCING YANG DIBAWA KEPADA HOSPITAL VETERINARY UNIVERSITI, UNIVERSITI PUTRA MALAYSIA PADA TAHUN 2015

Jangka hayat eritrosit kucing yang lebih kurang 73 hari adalah lebih singkat berbanding pada anjing yang lebih kurang 120 hari.Justeru, kucing lebih cenderung untuk mengembang anemia berbanding anjing.Malah, anemia adalah keadaan yang paling kerap berlaku pada kucing yang dirujuk kepada Hospital Veterinar University (UVH), Universiti Putra Malaysia (UPM).Kajian pencirian jenis anemia pada kucing yang dirujuk kepada UVH ini belum pernah dilakukan.Justeru, objektif kajian ini adalah untuk menentukan pengelasan dan aetiologi kes anemia felin di UVH, berdasarkan gerak balas sumsum tulang.Rekod klinikal retrospektif untuk tahun 2015 diperolehi dan dianalisis. Terdapat 162 ekor kucing beranemia, berumur di antara 7 bulan hingga 2 tahun, yang daripadanya 90 (55.56 %) adalah bukan jana semula sambil 72 (44.44 %) jana semula. Di kalang kucing ini, 65 (40.12 %) merupa kucing peliharaan dalam rumah, 59 (36.42 %) adalah separa bebas, dan 38 (23.46 %) di luar rumah. Tiga belas (52 %) ekor kucing yang pemvaksinan dan penyahcacingan terkini, mengidap anemia bukan jana semula, sambil 12 (48 %) mengidap anemia jana semula. Di kalang 52 ekor kucing yang diserang ektoparasit, 10 (19 %) mengidap anaemia bukan jana semula dan 42 (81 %) mengidap anemia jana semula. Di kalang kucing yang diserang pinjal pula, 39 (69.2 %) ekor dijangkiti mikoplasma hemotropik. Petanda klinikal paling kerap pada kucing anemia ialah penyahhidratan,

pucat, abdomen kembung, dan jaundis.Penyebab paling kerap untuk anemia pada kucing ialah penyakit berjangkit, kecederaan trauma, dan gangguan metabolisme. Tiga puluh ekor kucing, berumur 3 hingga 6 tahun, yang mengidap anemia diuji untuk jangkitan virus leukemia felin (FeLV) dan virus immunokurangan felin (FIV). Lapan belas (60 %) yang positif untuk FeLV atau FIV atau kedua-duannya sekali mengidap anemia bukan jana semula sambil 6 (20 %) mengidap anemia jana semula.Tidak terdapat sebarang perkaitan ($p>0.05$) antara jantina, pemvaksinan, penyahcacingan, umur, atau pengurusan dengan status janaan semula anemia.Bagaimanapun, ada perkaitan positif tererti ($p<0.05$) antara serangan pinjal, jangkitan FeLV dan FIV dengan anemia jana semula pada kucing.

Katakunci: anemia, jana semula, bukan jana semula, kucing, aetiologi, Hospital Veterinar Universiti, Universiti Putra Malaysia.

ABSTRACT

An abstract of the paper presented to the Faculty of Veterinary Medicine in partial fulfilment of the course VPD 4999 Project.

A RETROSPECTIVE STUDY ON ANAEMIA IN CATS PRESENTED TO THEUNIVERSITY VETERINARY HOSPITAL, UNIVERSITI PUTRA MALAYSIA FROM THE YEAR 2015.

By

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The life-span of cat erythrocytes at approximately 73 days is shorter than that of the dog at approximately 120 days. Thus, cats are more prone to develop anaemia than dogs. In fact, anaemia is one the most common condition among cats referred to the University Veterinary Hospital (UVH), Universiti Putra Malaysia (UPM). No study has been done to characterise the type of anaemia in cats referred to UVH. Thus, the objective of this this study is to determine the classification and aetiologies of feline anaemia cases in UVH, with respect to bone marrow response. Retrospective clinical records from year 2015 were obtained and analysed. There were 162 anaemic cats, of various ages, of which 55.56% (n=90) and 44.44% (n=72)had non-regenerative and regenerative anaemia respectively. Among these cats, 65 (40.12%) were kept indoors, 59 (36.42%) were semi-roamers, and 38 (23.46%) were outdoor cats. Of vaccinated and dewormed cats, 13 (52%) cats had non-regenerative anaemia while

12 (48%) had regenerative anaemia. Among 52 cats infested with fleas,69.2% were diagnosed with hemotropic mycoplasma. Of the 52 cats, 81 % and 19 % had regenerative anaemia and non-regenerative anaemia respectively. The most common clinical signs observed in anaemic cats were dehydration, pallor, distended abdomen, and jaundice. The most common cause of anaemia in cats were infectious diseases, traumatic injury, and metabolic disorders. Sixty percent (n=18) of cats positive for either FeLV or FIV or both had non-regenerative anaemia while 40% (n=12) had regenerative anaemia. There was no significant ($p>0.05$) association between gender, vaccination, deworming, age, or management andthe regenerative status of anaemia. However, there wasa significant ($p<0.05$) positive association between flea infestation, FeLV and FIV infections and theregenerative status of anaemia in cats.

Keywords: anaemia, non-regenerative, regenerative, cats, aetiology, University Veterinary Hospital, Universiti Putra Malaysia

1.0 INTRODUCTION

Anaemia is a reduction below normal in the total erythrocyte (RBC) count, packed cell volume (PCV), or hemoglobin (Hb) concentration and a consequent decrease in oxygen-carrying capacity and delivery to tissue (White and Reine, 2009). The condition can develop from loss, destruction, or lack of production of erythrocytes.In anaemia, the first step in defining the pathophysiology of the problem that involves assessment of bone marrow regeneration by determine blood reticulocyte count. Erythrocyte indices, which includes the mean corpuscular volume (MCV), mean corpuscular Hb concentration (MCHC), and erythrocyte morphology are determine to ascertain the cause of anaemia. (Day and Kohn, 2012).

There are two types of anaemia that is regenerative and non-regenerative anaemia. Regenerative anaemia is characterized by reticulocytosis and is typically occurs due to loss (hemorrhage) or destruction (hemolysis) of erythrocytes in the circulation. On the other hand, anaemia without reticulocytosis is referred to as non-regenerative anaemia and typically occurs in diminished erythropoiesis, impaired bone marrow erythrocyte production from whatever cause (Tvedten, 2010). Haemolytic anaemia is frequently associated with oxidative damage to erythrocytes, infectious agents such as *Mycoplasma haemofelis*, neoplasia, and primary immune-mediated syndromes. Non-regenerative anaemia is associated with a number of infectious agents, including feline leukemia virus (FeLV), Felin immunodeficiency virus(FIV), and coronaviruses associated with feline infectious peritonitis (FIP), as well as a variety of non-infectious diseases including neoplasia, renal disease, endocrinopathies such as diabetes mellitus, and bone marrow diseases (Kohn *et*

al.,2006).

Most causes of anaemia in cats can be diagnosed by history and physical examination of the patient, complete blood cell count, serum biochemical analyses, coagulation tests, diagnostic imaging and biopsy for neoplasia or other mass lesions such as abscessation, FeLV antigen test, FIV antibody test, polymerase chain reaction (PCR), and bone marrow examination.

Although it has been suggested that incats, the majority of anaemias are non-regenerative (Tasker, 2006), the classification and aetiologies of anaemia are not well-described. Thus, this study is aimed to determine the classification and aetiologies of feline anaemiain terms of regeneration status. The study also describesthe patient's history, signalment and physical examination findings of anaemic cats presented to the UVH, UPM. The information gain in this study will enable clinicians to understand the common causes of anaemia and the typical laboratory findings of cats with anaemia to assist them in the treatment of feline diseases.

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