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# Prevalence and Characteristics of Anaemia in Dogs: A Retrospective Study

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**ABSTRACT:** A retrospective study was conducted over four months, from January to April 2025, to investigate the prevalence and characteristics of anaemia in dogs presented for clinical examination. Out of 995 dogs evaluated, 124 (12.46%) were diagnosed with anaemia based on haematological parameters. Anaemia was classified as mild (66.13%), moderate (22.58%), or severe (11.29%) according to haemoglobin levels. Female dogs were marginally more affected (52.42%) compared to males (47.58%), and younger dogs were relatively more affected. Labrador Retrievers accounted for the highest breed incidence (23.38%). Haematological evaluation revealed leucocytosis in 60.48 per cent of cases, thrombocytopenia in 32.26 per cent, and thrombocytosis in 9.68 per cent, while most had normal platelet counts (58.06%). Babesiosis emerged as the leading cause of anaemia (30.65%), followed by parasitic infestations and renal disorders. These findings highlight the significance of comprehensive diagnostic evaluation in the effective management of anaemia in canine patients.

**KEYWORDS:** Anaemia, Canine, Prevalence, Babesiosis

## I. INTRODUCTION

Anaemia is one of the most frequently encountered haematological disorders in veterinary clinical practice and often serves as a clinical indicator of underlying systemic pathology. It refers to a reduction in the number of red blood cells (RBCs). It is diagnosed when the packed cell volume (PCV), haemoglobin concentration, and RBC count are lower than the established normal reference values for the species (Aiello *et al.*, 2016). The condition may result from a wide range of etiologies, including parasitic infestations, chronic inflammatory diseases, immune-mediated disorders, and nutritional deficiencies. Early detection, accurate classification, and identification of the underlying cause are crucial for the effective clinical management of anaemic patients.

Understanding the prevalence, haematological characteristics, and etiological factors associated with anaemia in dogs is essential for timely diagnosis, improved therapeutic strategies, and better clinical outcomes. Retrospective studies are particularly valuable in identifying trends and patterns in disease occurrence across populations and over defined periods, thereby contributing to evidence-based clinical decision-making.

The present retrospective study was undertaken to determine the prevalence, severity, and characteristics of anaemia in dogs presented to the Teaching Veterinary Clinical Complex (TVCC), Pookode, during the period from January to April



2025. The findings are expected to provide insights into the epidemiological and clinicopathological aspects of canine anaemia in the region, thereby supporting improved diagnostic and therapeutic approaches.

## II. MATERIALS AND METHODS

This retrospective study analysed clinical and laboratory records of dogs presented to the TVCC, Pookode, between January and April 2025. All dogs underwent clinical examination, and those with signs suggestive of systemic illness were subjected to complete blood count (CBC) analysis. The parameters measured included Total Erythrocyte Count (TEC), Haemoglobin (Hb) concentration, Packed Cell Volume (PCV), Total Leukocyte Count (TLC), and Total Platelet Count (PLT). A total of 995 samples were analysed, and animals with RBC less than  $4.95 \times 10^6/\mu\text{L}$  were considered anaemic (Aiello *et al.*, 2016). Based on reduced haemoglobin levels, the study group was further categorized as mild (7–12 g/dL), moderate (4–7 g/dL), or severe (0–4 g/dL) (Bhat *et al.*, 2016). For the diagnosis of anaemia, the data collected included sex, age, breed, RBC, Hb, PLT, leukocyte, and platelet counts. The distribution of various epidemiological factors contributing to anaemia was analysed using simple descriptive statistics, taking into account the overall prevalence as well as variations based on age, breed, sex, and etiology. A similar analysis was also carried out for haematological parameters.

## III. RESULTS AND DISCUSSION

Out of 995 dogs evaluated during the study period, 124 were diagnosed with anaemia, resulting in an overall prevalence of 12.46 per cent. In comparison, a six-month study by Panchal *et al.* (2022) reported a lower prevalence rate of 7.86 per cent, but some other studies showed a higher prevalence of 47.44 per cent (Singh *et al.*, 2012); 44.83 per cent (Bhat *et al.*, 2016), highlighting potential regional differences in the occurrence of anaemia among canine populations. Studies focusing specifically on dogs presenting with clinical signs of anaemia have reported considerably higher prevalence rates, likely due to the targeted selection of symptomatic animals (Meshram *et al.*, 2019; Tandel *et al.*, 2019; Rao *et al.*, 2024).

Haemoglobin concentration was used to categorize anaemia as mild, moderate, and severe (Bhat *et al.*, 2016). Based on haemoglobin concentration, 82 dogs (66.13%) were diagnosed with mild anaemia, 28 dogs (22.58%) with moderate anaemia, and 14 dogs (11.29%) with severe anaemia (Table 1). Similar trends were reported by Singh *et al.* (2012), Liu and Su (2015), and Bhat *et al.* (2016), where mild anaemia constituted the majority of cases, followed by moderate and severe forms.

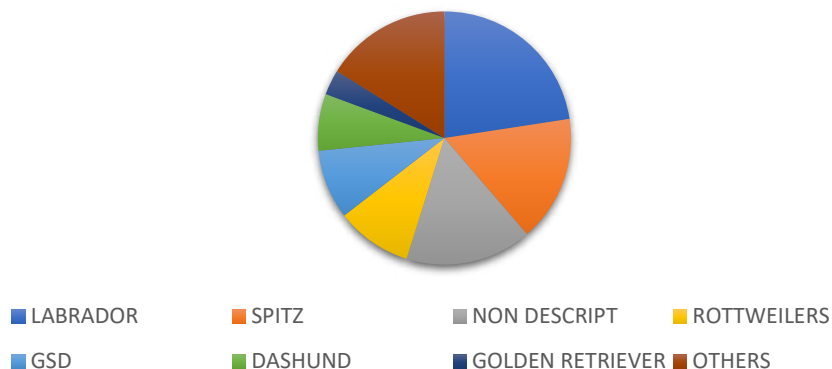
MILD	MODERATE	SEVERE
66.13%	22.58%	11.29%

**Table 1:** Severity of anaemia based on haemoglobin levels

In the present study, a slightly higher proportion of female dogs (52.42%) were affected by anaemia compared to males (47.58%), which aligns with the findings of Manev and Marincheva (2018), who reported a higher incidence of immune-mediated anaemia in female dogs. However, this pattern contrasts with findings from other studies Bhat *et al.*, (2016); Shah *et al.*, 2020; and Swami *et al.* (2024), where a greater prevalence of anaemia was observed in male dogs, suggesting that sex-related differences in anaemia occurrence may vary depending on the population studied and other contributing factors.

Breed-wise distribution showed that Labrador Retrievers were the most frequently affected (23.38%), followed by Spitz (16.13%) and non-descript breeds (16.13%). Rottweilers accounted for 12 cases (9.68%), while German Shepherd Dogs contributed 11 cases (8.87%), with the remaining instances spread across various other breeds (Figure 1). A higher prevalence among Labrador Retrievers was also reported by Bhat *et al.* (2016), Shah *et al.* (2020), and Panchal *et al.* (2022). In contrast, Singh *et al.* (2012) and Swami *et al.* (2024) observed a greater occurrence of anaemia in non-descript breeds, indicating potential regional or genetic influences on breed susceptibility.

Figure 1: Breed-wise distribution



Leukocyte count analysis showed leucocytosis in 75 of 124 anaemic dogs (60.48%), a normal range in 44 dogs (35.48%), and leukopenia in 5 cases (4.03%). Thrombocytopenia was observed in 40 dogs (32.26%), thrombocytosis in 12 (9.68%), while the majority had normal platelet counts (58.06%).

Age-wise distribution revealed that younger dogs were relatively more affected, with 46 cases (37.10%) occurring in dogs under 3 years of age, followed by 40 cases (32.26%) in the 3 to 6-year age group, and 38 cases (30.64%) in dogs older than 6 years (Figure 2). A similar age-related trend was reported by Singh *et al.* (2012), Shah *et al.* (2020), and Meshram *et al.* (2019), where younger animals exhibited a higher prevalence of anaemia, possibly due to increased vulnerability to parasitic infections, nutritional deficiencies, or immature immune responses.

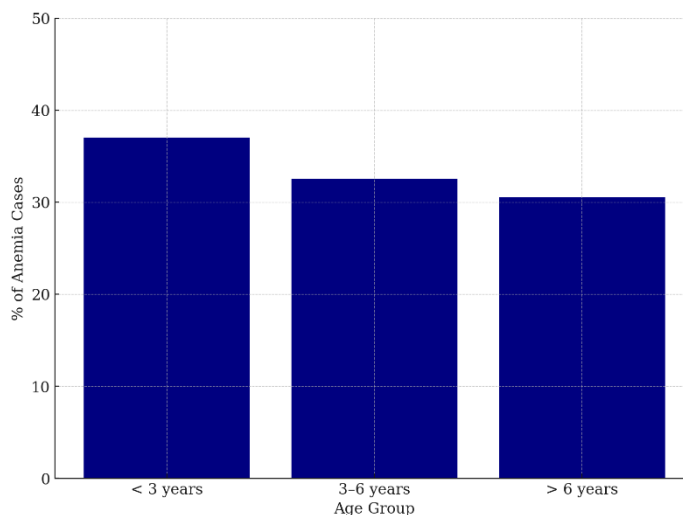


Figure 2: Age-wise distribution

Etiological evaluation identified babesiosis as the predominant cause of anaemia (30.65%), in accordance with the findings of Jain *et al.* (2017). Parasitic infestations (endo- and ectoparasites) and renal diseases each accounted for 16 cases (12.90%). Other causes included hepatic disorders (7.26%), tumours (7.26%), viral infections (6.45%), trauma-related conditions such as wounds or fractures (6.45%), pyometra (4.84%), leptospirosis (3.23%), hypothyroidism (3.23%), lung diseases (2.42%), and non-specific causes (1.61%). Concurrent infections were also observed, including babesiosis with leptospirosis (3 cases), babesiosis with endoparasitism (3 cases), and one case of babesiosis and pancreatitis. The major etiological finding of our study contradicted several earlier studies that identified other diseases as the primary cause of anaemia. For instance, renal failure was reported as a major contributor by Shah *et al.* (2020),

while gastrointestinal disorders were predominantly associated with anaemia in the works of Panchal *et al.* (2022) and Singh *et al.* (2012). Tandel *et al.* (2019) emphasized the role of hepatic dysfunction as a major cause of canine anaemia. These variations in etiological prevalence could be attributed to regional differences in disease burden, tick vector distribution, and diagnostic approaches. Nonetheless, the present study indicates that vector-borne and parasitic diseases remain a leading cause of anaemia in dogs, especially in tropical regions. The high incidence of leucocytosis and thrombocytopenia further supports the inflammatory and systemic nature of many of these cases.

#### **IV. CONCLUSION**

This study demonstrates a 12.46% occurrence rate of anaemia among dogs presented for clinical evaluation over four months at TVCC, Pookode, Wayanad. Female dogs were overrepresented in this study. Labrador Retrievers were the most commonly affected breed. Mild anaemia was the most prevalent form of anaemia. Babesiosis emerged as the predominant etiology, underlining the significance of tick-borne diseases in the pathogenesis of anaemia. The majority of the animals in the study group had leucocytosis and normal platelet counts. Routine CBC evaluation, coupled with comprehensive diagnostic investigations, is essential for timely diagnosis and targeted treatment. These findings reinforce the need for vigilant monitoring of haematological parameters and etiological factors in canine practice.

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#### **Conflicts of interest**

The authors declare that they have no conflict of interest.

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