



## **PATHOPHYSIOLOGICAL CHANGES OF BLOOD IN CATS WITH ANEMIC SYNDROME**

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**Abstract:** *This paper aims to carry out a study in which we investigate the variation of hematological and biochemical parameters in cats with anemic syndrome. The study was carried out on ten cats, females and males, of different breeds and ages. The aim is to provide a better understanding of these changes and to help establish more precise methods for diagnosing and monitoring the anemic syndrome in these animals.*

### • Introduction

Anemic syndrome represents one of the most complex and frequent clinical challenges in cats medicine, while not being a pathological entity on its own, but the hematological expression of a multitude of conditions. The present paper aims to carry out a study in which we investigate the variation of hematological and biochemical parameters in cats with anemic syndrome. Anemic syndrome is characterized by a reduction in the number of red blood cells, hemoglobin or both. Anemias consist in the functional insufficiency of erythrocytes, which through oligocythemia, hypovolemia, oligochromia or the functional blocking of hemoglobin, causes anemic hypoxia. The main definition of anemic syndrome explains a decrease in the number of circulating erythrocytes (due to the reduction of erythropoiesis, massive losses through hemorrhages or the intensification of hemolysis). Functionally, anemia consists in a decrease of the effective hemoglobin mass (by reducing the amount or through a functional blockage). The pathophysiological approach to anemias, as well as their identification, implies the existence of a decrease in the number of circulating erythrocytes. This can be related either to the acceleration of erythrocyte destruction or their loss, or to their improper production. In the veterinary clinic, this syndrome is present more and more often, causing specific problems.

### • Material and method

The study was conducted on ten cats, females and males, of different breeds and ages. The IdexxProCyteDxHematology analyzer was used in order to perform hematological exams. The hematological parameters examined by us were: red blood cells number (RBC), hematocrit (HTC), hemoglobin (HGB), and reticulocytes number (RETIC). The biochemical exams were performed using the IdexxCatalystOneChemistry analyzer. The biochemical parameters examined by us were: creatinine (CREA), blood urea nitrogen (BUN), total protein (TP), alaninaminotransferase (ALT), alkaline phosphatase (ALP), gammaglutamiltransferase (GGT), total bilirubin (TBIL), cholesterol (CHOL). Blood was taken from brachycephalic vein after haircut and skin asepsis. Vacutainers containing EDTA were used for the collection of hematological samples, while for the collection of biochemical samples, vacutainers with heparin were used.

### • Results and discussions

Regarding the changes in hematological parameters, decreases in all erythrocyte indices are observed. Thus, the average number of red blood cells (RBC) had the value of 4.91 M/ $\mu$ L, being 24.46% lower than the physiological minimum (6.54 M/ $\mu$ L). The hematocrit value was 20.77%, being 31.45% lower than the physiological minimum (30.3%). The hemoglobin value was 6.88 g/dL, being 29.79% lower than the physiological minimum (9.8 g/dL). These results support the existence of the anemic syndrome, which frequently accompanies the diseases suffered by the cats in our study.

Regarding the values of the biochemical parameters we noticed that the creatinine had a slightly increased value (2.55 mg/dL), being 6.25% higher than the maximum physiological value (2.4 mg/dL). BUN also had an increased value (51.8 mg/dL), being 43.88% higher than the maximum physiological limit (36 mg/dL). In the case of the GGT parameter, the average value recorded by us (5.77 U/L) represents a 44.25% increase compared to the physiological maximum (4 U/L). This finding can be explained by the induction of hepatic disorders (due to liver hypoxia caused by the anemic syndrome) In the case of the TBIL parameter, a slight increase is also noticed, as the value obtained by us (1.28 mg/dL) is 42.22% higher than the maximum physiological value (0.9 mg/dL). This explains the appearance of moderate jaundice in a few cases of the studied cats, aspects found in the literature in the field. When it comes to other biochemical parameters such as TP, ALT, ALP or CHOL, no differences were observed between the values obtained by us and the physiological values.

### • Conclusions

The values of the erythrocyte series were low in the case of all of the determined parameters, which proves the existence of the anemic syndrome, while the reticulocyte values were slightly increased, which means that in some cases the established anemia was of a regenerative type. CREA and BUN values were increased, so the observed anemia was induced by a secretory insufficiency of erythropoietin. GGT and TBIL values were also increased, which demonstrates the induction of liver disorders in cats with anemic syndrome (on the background of hypoxia). TP, ALT, ALP and CHOL parameters were not modified.