
ANIMAL HUSBANDRY

DOI: <https://doi.org/10.23649/jae.2022.27.7.003>

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Received: 19.09.2022; Accepted: 24.10.2022; Published: 18.11.2022

INDICATORS OF CLINICAL BLOOD PARAMETERS OF MINKS (*MUSTELA VISON*) WITH SHED KEEPING IN THE TVER REGION CLIMATE CONDITIONS

Research article

Abstract

A clinical blood count (CBC), also known as a complete blood count (FBC), is a set of laboratory tests that provide information about the cells in an animal's blood. Complete blood count is an important tool in hematology, which studies the etiology, prognosis, treatment and prevention of blood-related diseases. The main purpose of the study is to conduct a clinical blood count in minks in order to screen for possible pathologies. For the study, venous blood of 200 minks was analyzed. As a result of a clinical study of mink blood, no significant pathological changes were revealed. The data obtained make it possible to refer the above animals to the category of "clinically healthy" for further experiments.

Keywords: clinical blood count, complete blood count, mink, hematology.

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Получена: 20.09.2022; Доработана: 24.10.2022; Опубликована: 18.11.2022

ПОКАЗАТЕЛИ КЛИНИЧЕСКИХ ПАРАМЕТРОВ КРОВИ НОРОК (*MUSTELA VISON*) ПРИ ШЕДОВОМ СОДЕРЖАНИИ В ПРИРОДНО- КЛИМАТИЧЕСКИХ УСЛОВИЯХ ТВЕРСКОЙ ОБЛАСТИ

Научная статья

Аннотация

Клинический анализ крови (CBC), также известный как полный анализ крови (FBC), представляет собой набор лабораторных тестов, которые предоставляют информацию о клетках в крови животных. Общий анализ крови является важным инструментом гематологии, которая изучает причину, прогноз, лечение и профилактику заболеваний, связанных с кровью. Основная цель исследования - произвести исследование клинического анализа крови у норок с целью скрининга возможных патологий. Для проведения исследования была проанализирована венозная кровь 200 норок. В результате клинического исследования крови норок значительных патологических изменений выявлено не было. Полученные данные позволяют отнести вышеуказанных животных к категории «клинически здоровых» для проведения дальнейших поисковых исследований.

Ключевые слова: клинический анализ крови, полный анализ крови, норки, гематология.

1. Introduction

Currently, laboratory diagnostics has a powerful diagnostic potential, and the increasing volume of information and its clinical significance urgently require the introduction and improvement of the laboratory process at all stages: pre-analytical, analytical and post-analytical. The problem of the quality of laboratory test results is relevant all over the world. The parameters of a clinical blood test are one of the few quantitative characteristics that reflect the functional state of animals, the dynamics of physiological processes occurring in the body under the influence of various factors [1], [2].

CBC is often done as part of an evaluation of a health screening and can be used to monitor health or diagnose diseases. The results are interpreted by comparing them to reference ranges, which vary by gender and age [3].

Complete blood count is an important tool in hematology, which studies the etiology, prognosis, treatment and prevention of blood-related diseases. CBC and smear results reflect the functioning of the hematopoietic system—organs and tissues involved in the production and development of blood cells, especially bone marrow [4].

The main purpose of the study is to conduct a clinical blood test in minks in order to screen for possible pathologies.

2. Methods

As part of the scientific research work, venous blood was sampled from experimental animals (minks, females - 100 heads, males - 100 heads, age - 1 year) in the fur farm "Mermeriny" (Tver region, Kalinin district, Mermeriny village).

Blood sampling was carried out taking into account the rules of asepsis and antisepsis by cutting the tip of the tail into vacuum tubes for hematological studies with K3 EDTA [5].

The hematological parameters of the animals were determined in whole blood with an anticoagulant on a hematological analyzer, "ABACUS junior vet", which works quickly and accurately principles of impedance and spectrophotometry. It can detect up to 20 parameters of whole and diluted blood, including calculated indicators red blood and platelets, histograms of the distribution of leukocytes, erythrocytes and platelets by volume, partial differentiation leukocytes into three populations - lymphocytes, middle cells and granulocytes according to standard hematological methods [6]. You use the results of the analysis on the display of the analyzer and the built-in printer, which accurately reads the color change of the possible zones of the measurement of the strips forced to flow into the possible zones of special chemical phenomena. Then with the use of calibration calculations of analytics of economic indicators. We counted and evaluated the quantitative composition of uniform elements of venous blood. Modern hematological analyzers have accuracy and high productivity (up to 100-200 samples per hour), a small volume of blood (12-15 μ l) is required for analysis. Analyzer graphically presents the results of studies in the form of histograms and sketograms

The analyzer uses floating discriminator that performs mathematical calculations for calculation of the exact division between three populations of white blood cells cells (lymphocytes, granulocytes and fractions of medium cells). After performing sample analysis, the instrument produces two major peaks in within the overall distribution of cells (peak granulocytes and peak lymphocytes). By extrapolating the curves, the distribution of the two main populations leukocytes the third population can be mathematically calculated [7], [8].

Statistical research methods were not used due to the exploratory nature of the studies and the lack of control groups [9], [10].

The research results are presented in tables 1 and 2.

3. Results

Table 1 – Results of hematological examination of the blood of mink males

Parameters	Result, n=100	Reference
Red blood cells (RBC), $10^{12}/L$	8,92±0,26	6,73 - 9,41
Hemoglobin (HGB), g/l	165,00±12	134 - 178
Hematocrit (HCT), %	51,70±1,2	39,7 - 52,1
Mean corpuscular volume (MCV), fL	54,3±0,4	53,1 - 60,7
Color indicator	0,56±0,11	0,57 - 0,9
Mean corpuscular diameter (MCD), mcm	5,63±1,02	5,5 - 8,8
mean corpuscular hemoglobin (MCH), pg	18,65±	15,5 - 19,0
mean corpuscular hemoglobin concentration (MCHC), g/dl	34,51±0,28	33 - 35
RBC Distribution Width (RDW), %	17,30±1,2	11,9 - 16
Platelets (PLT), $10^9/L$	476±54	479 - 980
Plateletcrit (PCT), %	0,47±0,11	0,18 - 0,52
Platelet Distribution Width (PDW), %	7,40±0,06	5,6 - 8
Mean platelet volume (MPV), fL	9,80±1,12	7 - 9,2
Leukocytes (WBC), $10^9/L$	5,80±2,27	2,45 - 10,53
Neutrophils stab, %	1±1	0 - 2
Neutrophils segmented, %	57±4	13 - 28
Lymphocytes, %	34±9	65 - 77
Monocytes, %	2±2	0 - 4
Eosinophils, %	2±1	0 - 1
Basophils, %		0 - 0
Neutrophils stab (abs), $10^9/L$	0,12±0,02	0 - 0,05
Segmented neutrophils (abs), $10^9/L$	3,31±1,13	0,1 - 5,18
Lymphocytes (abs), $10^9/L$	1,97±1,45	1,02 - 5,22
Monocytes (abs), $10^9/L$	0,23±0,07	0 - 0,45
Eosinophils (abs), $10^9/L$	0,17±0,03	0 - 1,35
Basophils (abs), $10^9/L$		0 - 1,13
Erythrocyte sedimentation rate (ESR), mm/h	1,0±1	0 - 3
Morphology of erythrocytes		
Morphology of leukocytes - single hypersegmentation of neutrophil nuclei		

Table 2 – Results of hematological examination of the blood of female minks

Parameters	Result, n=100	Reference
Red blood cells (RBC), 10 ¹² /L	10,18±1,12	6,73 - 9,41
Hemoglobin (HGB), g/l	194,00 ±14	134 - 178
Hematocrit (HCT), %	59,30 ±3,4	39,7 - 52,1
Mean corpuscular volume (MCV), fL	58,00 ±1,1	53,1 - 60,7
Color indicator	0,57	0,57 - 0,9
Mean corpuscular diameter (MCD), mcm	5,68 ± 0,18	5,5 - 8,8
mean corpuscular hemoglobin (MCH), pg	19,06 ± 2,04	15,5 - 19,0
mean corpuscular hemoglobin concentration (MCHC), g/dl	32,72 ±0,48	33 - 35
RBC Distribution Width (RDW), %	17,90 ± 2,3	11,9 - 16
Platelets (PLT), 10 ⁹ /L	572 ±58	479 - 980
Plateletcrit (PCT), %	0,51 ± 0,01	0,18 - 0,52
Platelet Distribution Width (PDW), %	9,71 ±1,25	5,6 - 8
Mean platelet volume (MPV), fL	8,90 ±0,15	7 - 9,2
Leukocytes (WBC), 10 ⁹ /L	7,10 ± 0,2	2,45 - 10,53
Neutrophils stab, %	2 ± 2	0 - 2
Neutrophils segmented, %	35 ± 4	13 - 28
Lymphocytes, %	49 ± 12	65 - 77
Monocytes, %	4 ± 3	0 - 4
Eosinophils, %	4 ± 1	0 - 1
Basophils, %	0	0 - 0
Neutrophils stab (abs), 10 ⁹ /L	0,28 ± 0,11	0 - 0,05
Segmented neutrophils (abs), 10 ⁹ /L	2,49 ± 1,32	0,1 - 5,18
Lymphocytes (abs), 10 ⁹ /L	3,48 ± 2,03	1,02 - 5,22
Monocytes (abs), 10 ⁹ /L	0,50 ±0,05	0 - 0,45
Eosinophils (abs), 10 ⁹ /L	0,36 ± 0,14	0 - 1,35
Basophils (abs), 10 ⁹ /L	0	0 - 1,13
Erythrocyte sedimentation rate (ESR), mm/h	1,0 ± 1	0 - 3
Morphology of erythrocytes		
Morphology of leukocytes - single hypersegmentation of neutrophil nuclei		

As a result of the analysis of the results obtained, no significant differences were found in the clinical analysis of blood in males and females.

During microscopy of smears, lymphocytes have a strongly wrinkled nucleus with condensates of chromatin, occasionally there is a pronounced granularity of a bright purple color when azure is used. Most of the cells of the segmented form have a barely noticeable granularity, which is a variant of the norm. The nuclei of eosinophilic cells are round, while the nuclei of eosinophils and neutrophils are annular. Monocytes are very different from lymphocytes, which are slightly larger than about two erythrocytes, have a large bean-shaped nucleus, and a wide protoplasmic border that stains blue or purple and has granulation. Platelets are found in the form of limited groups. There is a single hypersegmentation of the nuclei of neutrophils.

Changes in some indicators compared to the reference values do not indicate pathological processes and are probably associated with the nature of feeding and water consumption, are reversible.

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The data obtained make it possible to refer the above animals to the category of "clinically healthy" for further exploratory studies.

Funding

This work was supported by the Russian Science Foundation (Project No. 22-26-00158).

Финансирование

Работа выполнена при поддержке Российского научного фонда (проект № 22-26-00158).

Conflict of Interest

None declared.

Конфликт интересов

Не указан.

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