



## Hematological Changes in Mixed Infection of Pullorosis and Streptococci in Chickens

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**Summary:** The article provides information on hematological changes in chickens infected with mixed pathogens of pullorosis and streptococci. Information on pathomorphological changes in the body of birds with a mixed form of these diseases is also presented.

**Keywords:** Pullorosis, streptococcus, colony-forming unit, mixed infection, leukocyte, basophil, eosinophil, atrophy, dystrophy, thrombosis, infiltration.

**Relevance of the topic.** One of the diseases that causes significant damage to poultry farming is a mixed infection of poultry pullorosis and streptococcosis. In many cases, streptococcosis, according to the results of scientific research, can be interpreted rather as accompanying secondary diseases when farms are affected by pullorosis of chickens.

In the early stages of life, chickens are susceptible to diseases, like other young organisms, including mixed forms of infections, especially pullorosis and streptococcus in birds, which in foreign literature are more severe.

The increasing epidemiological significance of poultry and poultry products, the continuity of this process, changes in the sanitary and epidemiological service in our republic, the system of epidemiological control over existing salmonellosis and other secondary diseases require its reconstruction [3].

Analysis of literature data shows that to date, in poultry farms of our republic, the weight of chickens from chickens is 26-40 percent among all infectious diseases [1]. Pathomorphological diagnosis of chickens infected with a mixed infection of avian pullorosis and streptococci is considered one of the urgent tasks facing specialists [2].

**Objects and methods of research.** When studying hematological processes during mixed infection of chickens with pullorosis and streptococcal diseases, in the laboratory of hematology and biochemistry of the Central Hospital of the Samarkand region (before and after the results of the experiment), studies are carried out to determine the pathomorphological changes in the body of birds infected with these pathogens, the study of microbiology, the study of pathomorphology and diseases young animals were carried out in the laboratories of the Veterinary Research Institute.

To analyze erythrocytes from blood samples of week-old chickens infected with *S. pullorum* and *St. zooepidermicus*, the Panchenkov method was used, and the Sali hemometer was used to determine hemoglobin [4].

In order to study the histology of pullorosis and streptococci in the laboratory, samples were taken from the organs of infected and forcibly slaughtered chickens for pathomorphological examination. To do this, samples were taken from the following organs by biopsy for histological examination of small samples: trachea, lymph nodes, liver, lungs, heart, spleen and kidneys, and pathological changes were examined histologically [7]. All examined birds had pathological samples taken from

internal organs for bacteriological examination and cultured on various nutrient media (Levin, Salmonella Shigella and 5% blood agar).

Sections were obtained from the blocks using a microtome, a micropreparation was prepared on a glass slide, stained with hematoxylin and eosin, and subjected to microscopy. As a result of microscopy, pathohistological changes were revealed in the internal organs of birds. A 10x0.25 Carl Zeiss microscope objective was used.

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**Results and their analysis.** When taking blood samples from the subwing vein of sick birds on days 1-5 after the experiment, observing the rules of asepsis and antisepsis, the number of erythrocytes was 29.7%, the number of leukocytes and platelets was 12.45 and 6.72%, the amount of hemoglobin was reduced by 21.6% compared to the blood parameters of chickens of group II comparative control (Table 1).

### Hematological changes in chickens infected with pathogens *S. pullorum* and *St. zoepidermicus* (Table No. 1)

Check time	Red blood cells, million/ $\mu$ l	Leukocytes, thousand/ $\mu$ l	Leukoformula					
			Э	Б	М	Л	Neutrophils	
							main rod	main joint
Norm	3,18 $\pm$ 0,14	25,18 $\pm$ 1,5	2,8	2,2	4,4	56,6	4,4 $\pm$ 0,31	40,4 $\pm$ 3,23
<b>I experimental group 0.5 ml 05 billion m.p. n=10</b>								
Day 1	3,24 $\pm$ 0,18	31,45 $\pm$ 1,48	3,1	1,76	3,9	58,2	4,6 $\pm$ 0,27	35,5 $\pm$ 2,31
Day 2	3,19 $\pm$ 0,17	30,29 $\pm$ 1,62	3,2	1,8	4,0	58,0	4,2 $\pm$ 0,24	34,5 $\pm$ 2,26
Day 3	3,16 $\pm$ 0,22	30,20 $\pm$ 2,28	2,6	1,7	4,7	59,4	4,1 $\pm$ 0,38	40,4 $\pm$ 2,34
Day 4	3,32 $\pm$ 0,26	31,28 $\pm$ 2,04	2,2	1,7	4,4	59,2	4,3 $\pm$ 0,34	41,0 $\pm$ 2,61
Day 5	3,20 $\pm$ 0,28	29,74 $\pm$ 2,18	2,9	1,75	4,2	61,4	4,0 $\pm$ 0,26	43,2 $\pm$ 2,64
<b>II control group 0.5 ml of 0.9 percent saline solution n=10</b>								
Day 1	3,20 $\pm$ 0,19	25,21 $\pm$ 1,52	3,1	2,2	3,9	55,2	4,6 $\pm$ 0,27	35,5 $\pm$ 2,31
Day 2	3,21 $\pm$ 0,18	24,33 $\pm$ 1,86	3,2	1,8	4,0	53,4	4,2 $\pm$ 0,24	34,5 $\pm$ 2,26
Day 3	3,34 $\pm$ 0,18	22,26 $\pm$ 2,04	2,6	1,9	4,2	54,1	4,1 $\pm$ 0,38	40,4 $\pm$ 2,34
Day 4	3,31 $\pm$ 0,19	23,28 $\pm$ 2,07	2,2	1,8	4,1	54,2	4,3 $\pm$ 0,34	41,0 $\pm$ 2,61
Day 5	3,35 $\pm$ 0,24	24,74 $\pm$ 2,01	2,9	2,1	4,3	51,6	4,0 $\pm$ 0,26	43,2 $\pm$ 2,64

Note: xxx-P<0.01; xxxx-P<0.001.

The number of basophils in the blood smear did not differ significantly from the number of basophils in the blood of healthy chickens in the comparative control group.

Major changes were observed in other types of leukocytes.

The number of eosinophils increased by 16.9%, pseudoeosinophils by 34.8%, the number of monocytes by 19.42%, and the number of lymphocytes decreased by 11.86%.

Thus, with mixed infection of chickens with pullorosis and streptococci, studies have revealed a decrease in morphological blood parameters, that is, the number of red blood cells and hemoglobin, and an increase in the number of leukocytes and platelets.

In the leukocyte formula, the number of eosinophils, pseudoeosinophils and monocytes sharply increased by 21.16%, and the number of lymphocytes decreased, without changing the number of basophils.

According to the results of histological examination: during histological examination of the internal organs of chickens, the main changes more often occur in parenchymal organs and a strong development of hemodynamic and dystrophic processes is observed in them.

Cardiovascular vessels are dilated, the cells of the vascular wall are swollen, the endothelium is displaced, around some vessels there are many accumulations of histiocytes, lymphoid and leukocyte cells, the muscles are divided into fibers, some of the fibers have undergone granular degeneration.

Hemorrhagic necrotizing pneumonia develops strongly in the lungs. The cavities of most alveoli are filled with red blood cells. The interalveolar capillary networks are expanded and filled with blood, as a result the walls thicken and the connective tissue fibers swell. As a result of these changes, a significant part of the lung parenchyma undergoes atelectasis. Interstitial tissue also swells throughout the lungs.

Changes in the larynx and larynx were expressed in the form of catarrhal or severe fibrinous-hemorrhagic and desquamative inflammation. Due to the fact that in the birds of the first experimental group the desquamation of the respiratory epithelium was greatly aggravated, the private layer of the mucous membranes was completely opened and sharply swollen, and also infiltrated with a large number of pseudoeosinophilic leukocytes. Lymphoid cells collect along some vessels. The mucous membrane of some birds is partially necrotic and edematous.

A necrotic mass consisting of fibrin, fragments of respiratory epithelium, pseudoeosinophils, lymphocytes and erythrocytes was found in the laryngeal cavity and larynx.

Pathohistological changes in the spleen are expressed by the fullness of the vessels, slight swelling of the trabeculae, and uncertainty in the appearance of the fibers. The border of the red pulp is expanded. In some places, small hemorrhages and lymphoid accumulations are visible. These changes are a consequence of the general pathohistological process occurring in the body.

Histological changes in lymph nodes are not the same in all nodes. Noticeable changes are observed in the nodes between the hilus, the intestinal mesentery and the wall of the lung, where serous edema, serous-hemorrhagic lymphadenitis, and extravasates of various sizes develop. In addition to hemorrhages in the lymph nodes located near areas of the lungs with severe pathological processes, the sinuses are filled with lymphocyte and leukocyte accumulations; in older birds, the size of the follicles increases and the number of lymphocytes increases.

Pathohistological changes in the kidneys are predominantly general pathological processes; hemodynamic changes and granular, sometimes fatty degeneration of the epithelium of the renal tubules are often detected. As a result of the expansion of the capillary networks of the kidney balls, only clusters of red blood cells were visible under the microscope. It was found that the capsules around the balls were enlarged and filled with purulent and fibrinous exudate. Ring and straight tubes are not identified due to the proliferation of the epithelium. Epithelial nuclei underwent rhexis and lysis. The kidneys also undergo morphological changes and, as in other organs, irreversible processes occur.

**Conclusions.** In mixed infections of chicken pullorosis and streptococcus, pathohistological changes are predominantly general dystrophic processes; hemodynamic changes are often detected.

With mixed infection of chickens with pullorosis and streptococci, morphological blood parameters, that is, the number of erythrocytes and hemoglobin, decreased by 29.7 and 21.6 percent, respectively, and the number of leukocytes and platelets increased by 12.45 and 6.72 percent.

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