



THE COURSE AND PATHOMORPHOLOGICAL DIAGNOSIS OF MIXED INFECTIONS (SALMONELLA-COLIBACTERIOSIS) IN RABBITS

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Abstract

The article covers information about pathological processes during the mixed development of salmonellosis and colibacillosis in rabbits. The clinical signs and course of this mix of infection in rabbits subjected to artificial infection with *Escherichia* and *Salmonella* at a dose of 1.5 billion (0.75 billion each) of microbial bodies of pathogens are presented in detail. The results of pathological and histological studies of internal organs in experimental animals are widely described.

Introduction

The spread of a mixed infection of salmonellosis and colibacillosis in rabbits is one of the pressing problems, due to the enormous economic damage caused to farms in this livestock sector. Currently, scientists have comprehensively studied the unique course of salmonellosis and colibacillosis separately. However, in recent years, one of the most pressing problems in this area is the fact that these diseases occur not only in rabbits, but also in other animals in a mixed form. The degree of knowledge of the problem. Salmonellosis is an infectious disease of rabbits 1-3 months of age and pregnant queens, which fall ill most often in summer and autumn. In this case, animals clinically experience food refusal, lethargy, drowsiness and diarrhea. At autopsy, inflammation of the gastrointestinal tract, hemorrhages of the large intestines,



fibrinous-serous inflammation of the stomach, enlargement of the spleen with the presence of necrotic lesions are noted [2,9,11].

Colibacillosis is characterized by high mortality in 5-9 week old rabbits. Clinical signs of the disease include increased body temperature, consumption of large amounts of fluid, yellowish-gray diarrhea, a sharp decrease in live weight and exhaustion, inflammation of the visible mucous membranes and redness around the anus [1,5,8]. Salmonellosis and colibacillosis in cattle and small ruminants, as well as fur animals, have been studied in detail separately and appropriate vaccines have been created to prevent these diseases. In addition, numerous studies have been conducted on the mixed course of pasteurellosis, colibacillosis and salmonellosis in cattle and small ruminants, poultry and a polyvalent vaccine has been developed [3,7].

Such a combined course of colibacillosis and salmonellosis in rabbits 20 days old - 2.5 months old and fatal in up to 65% of sick animals is one of the most pressing problems in rabbit farms and the private sector of Uzbekistan [4,6,10].

Purpose of research. In recent years, due to the accelerated development of rabbit breeding in our country, there has been an urgent need for a thorough study of infectious diseases of this species of animals, and especially pathological and histological studies, in mixed cases.

Materials and Methods

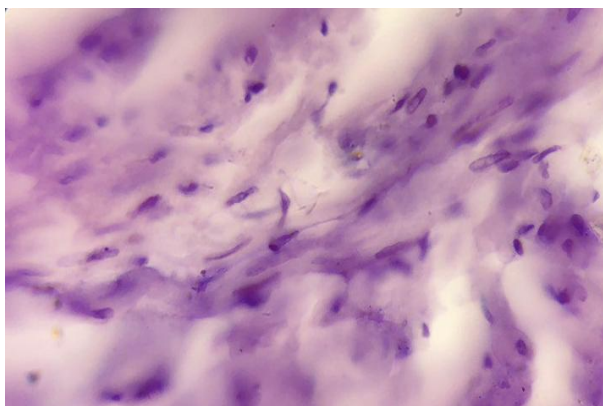
Scientific research was conducted in the laboratories of pathomorphology and the study of diseases of young animals of the Veterinary Research Institute on 8 rabbits aged 1-2 months using clinical, pathological and histological methods. Rabbits of the experimental group (4 heads) were infected with daily cultures of *E. coli* and *S. enteritidis* in mixed form at a dose of 0.5 (0.25) ml of culture suspension or 1.5 billion (0.75 billion) microbial bodies of pathogens, which corresponded to LD50. The second group of animals served as a control and were not infected.

Research Results

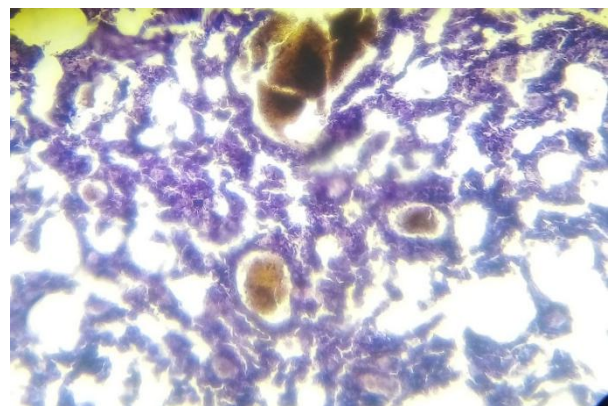
Clinical signs of the disease in the animals of the experimental group appeared already on the second day after infection in the form of yellowish-greenish diarrhea, bloating of the abdominal cavity, as well as refusal to feed, lethargy, drowsiness, an increase in body temperature to 42 ° C, after which death occurred on days 3-7 animals. The pathological picture of the study of the corpses of dead rabbits of the first group was

characterized by myocardial infarction, inflammation of the pericardium, exudative and proliferative phenomena. In the spleen, follicular hyperplasia and splenitis were noted, fibrinous-hemorrhagic changes and nodules at the entrance of the appendix, cecum and colon were also observed. Dystrophic changes and necrotic lesions were detected in the liver, and inflammation in the stomach, as well as sphincter hemorrhage.

At the same time, pieces of internal organs were taken from all dead animals, which were fixed in 12% formalin, processed histologically and embedded in paraffin, then stained with hematoxylin-eosin and subjected to microscopy. A morphological study of sections from the parenchymal organs of rabbits revealed serious changes. Thus, in the myocardium there is increased fibrousness, edema and hemorrhages, hemostasis and hemosiderin microthrombi in the blood vessels, deformation and lysis of myocytes (Fig. 1).



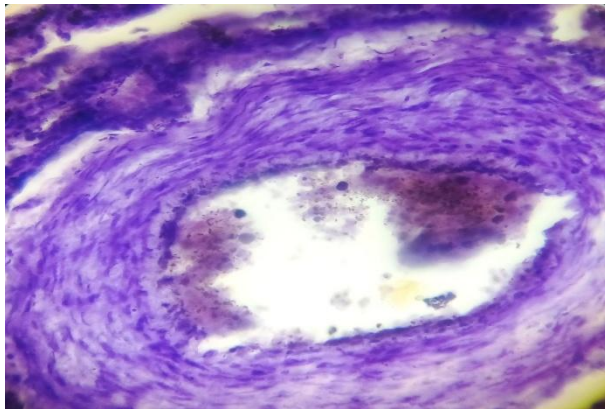
Figurae 1. Violation of myocyte structure, hemostasis and hemosiderin vascular microthrombi, deformation and lysis of myocytes.



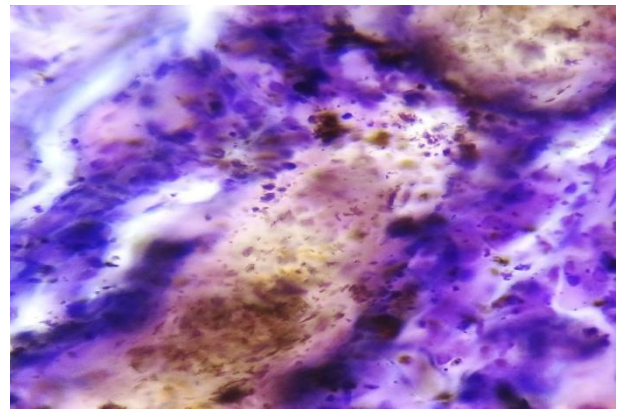
Figurae 2. Hemosiderosis and emphysema in the alveoli of the lungs.

The venous vessels of the pulmonary tissue are full-blooded, in the capillaries processes such as hemostasis, aggregation and agglutination of erythrocytes, alterative dystrophic and necrotic changes, necrosis and dequamation of alveocytes, degeneration of vacuoles, desquamation of alveolar macrophages and the presence of hemosiderin grains in their cytoplasm are established. Atelectasis is observed in most alveoli. In some parts of the histological section, emphysematous expansions are

observed, in the lumen of which there are cellular detritus, lymphocytes, macrophages, hemosiderin grains and plasma (Fig. 2-4).

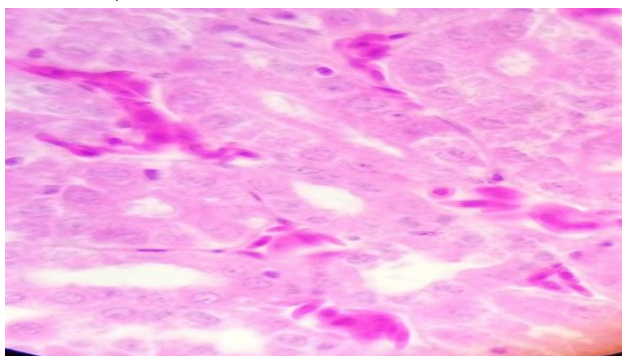


Figurae 3. Thickening of the walls of the alveoli.

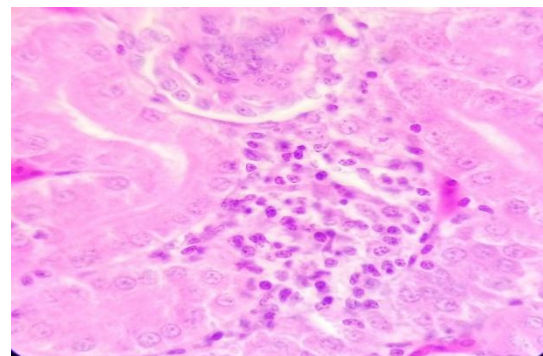


Figurae 4. Residual acidosis in the lung parenchyma.

Microscopy of histosections of the kidneys has established that in the renal glomeruli there develops infiltration of lymphohistiocytic cells, filling of the lumens with serous exudate, necrobiosis and necrosis of cells in some parts of the convoluted tubules, as well as infiltration of individual tubules with lymphocytes, fibroblasts and fibrocytes. The Shumlyansky-Bowman capsules are edematous, the blood vessels are full of blood. The collecting ducts of the medulla of the kidneys are infiltrated, the interstitial connective tissue is edematous, i.e. tubulointerstitial nephritis is observed (Figuraes 5 and 6).



Figurae 5. Infiltration and necrosis of the renal collecting ducts.



Figurae 6. Accumulation of red blood cells in the collecting ducts, accumulation of cells and swelling of the interstitial connective tissue renal medulla tissue.

When examining liver histosections, general lymphohistiocytic infiltration and hemosiderosis, rhexis and pycnosis of hepatocyte nuclei were established in the parenchyma. In addition, edema and infiltration of the walls of blood vessels are also observed in some places. (Figure 7).

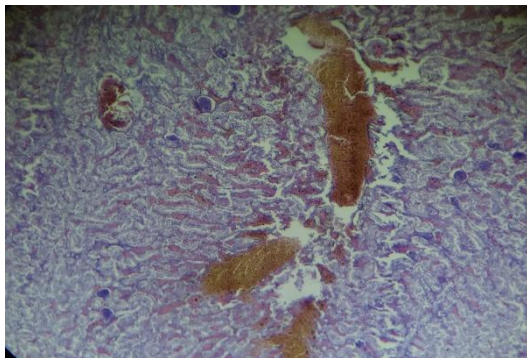


Figure 7. Infiltration of the liver parenchyma, exudative inflammation, desquamation and vascular hemosiderosis

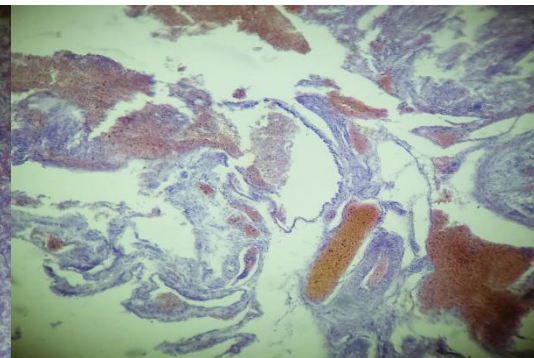


Figure 8. Desquamation and infiltration of cells, fibrinous necrosis on the mucous membrane of the small intestines.

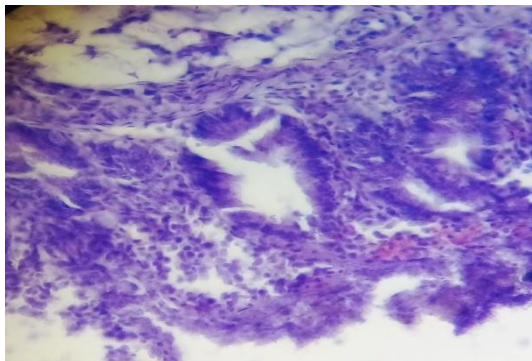


Figure 9. Desquamation and granular degeneration of the thick mucosa intestines.

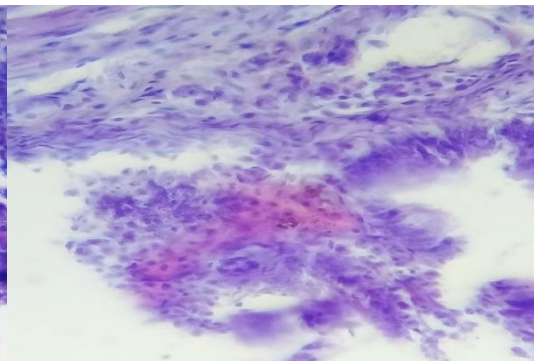


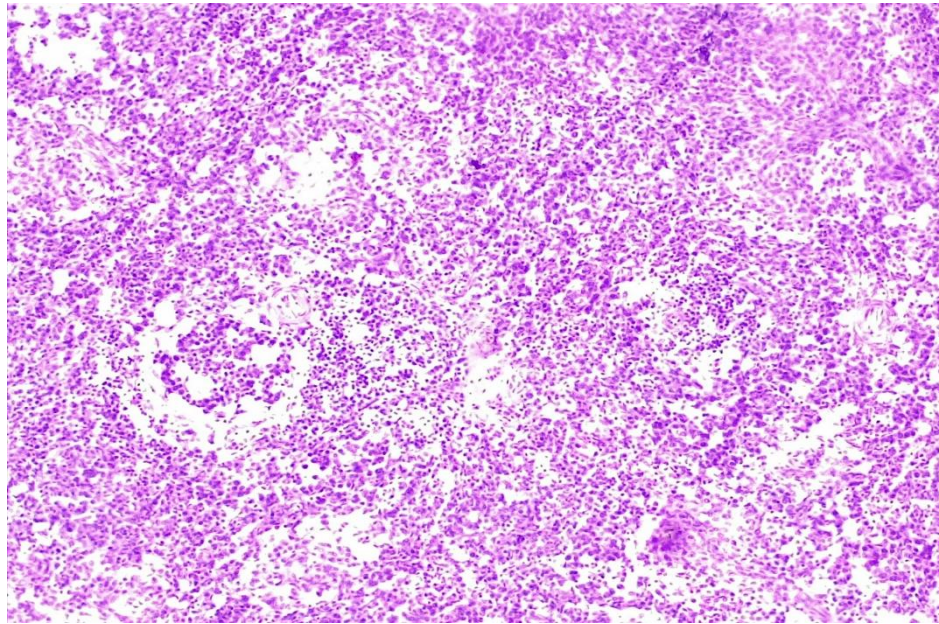
Figure 10. Necrosis and infiltration of cecal mucosa by lymphocytes intestines.

On the mucosa of the small and large intestines, desquamation of epithelial cells and fibrinous necrosis are observed. In the lumen of the cecum there is a perienterocyte accumulation of desquamated lymphocytes. Intestinal enterocytes are hypertrophied, with multiple lymphocytes located between them (Figuraes 8-10).

In addition, it was found that the villous cells are subject to necrosis and hydropic hyaline-droplet degeneration.

Histological examination of sections from the spleen established one of the types of protein dystrophy - hyalinosis. In this case, the protein fractions of hyaline are densely

located in the form of translucent cartilage-like substances along the walls of blood vessels. Desquamation and necrotic changes are developed in the lymphoid follicles (Figurae 11).



Figurae 11. Protein dystrophy (hyalinosis) and necrotic changes spleen.

Pathological and morphological studies of rabbits of the second control group did not reveal any changes in the organs.

Conclusion

Thus, the mixed simultaneous course of colibacillosis and salmonellosis in rabbits, in contrast to the disease with these infections separately, is manifested by deeper and broader irreversible pathological and morphological changes, which are most strongly expressed in the respiratory and digestive systems.

References

1. Peter K. Berghof. "Small Pets" "Aquarium", Moscow, (2006), pp.48-77.
2. Vorokov V.Kh. "Effective rabbit breeding", Krosnodar, (2013), 170 p.
3. Zufarov K.A. and others. "Practical guide to histology" , (1976).
4. Ibadullaev F. Pathological anatomy of farm animals", Publishing house "Uzbekistan", (2000).



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5. Leontyuk S.V. et al. "Diseases of rabbits" Moscow, "Kolos" , (1974), pp. 82-87, 122-125.
 6. Strukov A.I., Serov V.V. "Pathological anatomy" , Textbook, (2011).
 7. Elmurodov B.A., Turdiev A.K., N.Nabieva . "Rabbit breeding", Samarkand, (2018).
 8. Sultanova, I., & Juraev, O. (2022). Methods for determining the differences and similarities between rabbit colibacillosis and salmonellosis. Prospects for the development of veterinary science and its role in ensuring food safety, 1(2), 458-461.
 9. Sultanova, I., & Djuraev, O. (2022). Methods for determining the differences and similarities between rabbit colibacillosis and salmonellosis. Prospects for the development of veterinary science and its role in ensuring food safety, 1(2), 458-461.
 10. Sultanova, I. Y., & Dzhuraev, O. A. (2022). Pathological anatomical changes and the results of histological examination in rabbit colibacillosis.
 11. Davlatov, R. B., & Khushnazarov, A. K. (2024). Diagnosis and chemoprophylaxis of rabbit eymeriosis. In *E3S Web of Conferences* (Vol. 480, p. 03020). EDP Sciences.