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MEASURES AGAINST COLISEPTICEMIA IN YOUNG ANIMALS

I.A. Hazratqulov
PhD student, Veterinary Research Institute.
B.B. Mustafoyev
Independent Researcher.

ABSTRACT

This scientific study is devoted to the etiology of colisepticemia in young animals, sources of the infectious agent, routes of transmission to healthy animals, clinical course, diagnosis and treatment, as well as measures for disease control and herd/flock health improvement.

ABSTRACT (Russian)

This article presents materials on the etiology and spread of infection, sources of the infectious agent and clinical signs, methods of diagnosis and treatment, prevention and control of colibacillosis in animals.

SUMMARY

This article presents materials on the etiology and spread of infection, sources and routes of transmission of the infectious agent, clinical signs, diagnostic methods, and measures for the prevention and control of animal colibacillosis.

Keywords: colibacillosis, colisepticemia, Escherichia, GOA, formalin vaccine, calves, lambs, sheep, diagnosis, prevention, treatment.

RELEVANCE OF THE TOPIC

This article contributes, to a certain extent, to the implementation of the tasks defined in the Decrees of the President of the Republic of Uzbekistan PF-60 dated January 28, 2022, “On the Development Strategy of New Uzbekistan for 2022–2026”; PF-5696 dated March 28, 2019, “On measures to radically improve the state administration system in the field of veterinary medicine and livestock”; Resolution PQ-4841 dated March 16, 2017, “On additional measures to deepen economic reforms in livestock breeding”; Resolution PQ-4576 dated January 29, 2020, “On additional measures for state support of the livestock sector”; Resolution PQ-121 dated February 8, 2022, “On measures for further development of livestock breeding and strengthening the feed base”; as well as other regulatory and legal documents related to this field.

The rapid development of livestock farms in our country is significantly hindered by coli-infectious diseases belonging to the group of opportunistic infections that frequently occur in young animals. Colibacillosis occurs in all species of young animals in the forms of diarrhea, enterotoxemia and septicemia, has a very acute course, and may lead to the death of affected young animals.

The causative agent of the disease is the enteropathogenic bacterium “Escherichia coli”, whose antigenic properties are highly complex. The bacterium contains a somatic O antigen, a capsular K antigen, and a flagellar H antigen. Literature reports indicate approximately 170 serotypes of the O antigen, 100 serotypes of the K antigen, and 60 serotypes of the H antigen. Therefore, development of

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specific preventive and therapeutic measures against colibacillary infections presents complex problems. For this reason, raising lambs, kids, calves, foals and other young animals to 100% health is difficult. Analysis of the above indicates the need to develop a vaccine against strains of colibacteria circulating in our country.

Economic damage caused by the disease includes mortality of young animals, reduction in livestock numbers, disruption of breeding work, decreased productivity, costs of treatment and preventive measures, contamination of the environment, and expenditures on disinfectants.

Based on the above, ensuring 100% survival and normal growth and development of young animals under the conditions of collective, household and farm enterprises, and effectively protecting them from colisepticemia, is one of the important tasks facing veterinary science and practice.

AIM AND OBJECTIVES OF THE STUDY

The aim was to increase livestock numbers by improving specific and non-specific measures against colibacillosis in young animals and to introduce into practice the GOA formalin vaccines developed at the Veterinary Research Institute (VRI). The study included the following objectives:

• To isolate strains from young animals affected by colibacillosis and study their cultural, morphological, tinctorial, biochemical, serological and immunogenic properties.

• To prepare GOA formalin vaccine against colibacillosis from highly immunogenic strains and introduce it into practice.

RESEARCH OBJECT AND METHODS

At the Laboratory of Young Animal Diseases of the Veterinary Research Institute, at Samarkand State University of Veterinary Medicine, Livestock and Biotechnology, Department of Epizootology and Infectious Diseases, and in veterinary laboratories, Escherichia isolated from pathological materials obtained from young animals with colibacillosis from livestock and poultry farms were examined for cultural, morphological, tinctorial, biochemical, serological and immunogenic properties using generally accepted methods.

Based on the properties of the bacteria, identification was carried out according to R.A. Tzion's (1948) bacterial identification key and the table corresponding to the bacterial group number; the appropriate bacterial name was determined from the results. In addition, serological and other tests were performed to further confirm the bacterial species. Pathogenicity of the agents was studied in standard white mice: 500 million microbial bodies of a suspension were administered subcutaneously and 300 million microbial bodies intraperitoneally, followed by 10 days of observation. Serogroups of Escherichia isolated from diseased animals were identified by serological reactions, and their sensitivity to antibiotics and sulfonamide preparations was studied using the indicator-disk method.

Clinically, 56 calves, including 27 examined pathoanatomically; 118 sheep and lambs, including 36 examined pathoanatomically; and 86 chickens, including 78 examined pathoanatomically, were studied. Pure cultures of "Escherichia coli" were isolated from all diseased animals.

In addition, experimental colibacillosis was studied under VRI laboratory conditions in 9 calves, 15 lambs and 40 poultry by clinical, pathoanatomical, bacteriological and serological methods.

The GOA formalin vaccine against colibacillosis of sheep and lambs prepared at the VRI contained the E. coli strains 09, 020, 026, 041, 055, 078, 0111 and 0119, which are common in our country. The associated GOA formalin vaccine against colibacillosis and salmonellosis in calves, lambs and piglets additionally contained Salmonella Dublin, S. Typhimurium, S. abortus bovis and S. cholerae suis. The

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polyvalent radiovaccine against colibacillosis, salmonellosis and pasteurellosis in calves, lambs and piglets additionally contained Pasteurella multocida and P. haemolytica. The GOA formalin vaccine against poultry colibacillosis contained the E. coli strains 09, 026, 041, 055, 078 and 0111 commonly found in chickens and chicks in our country. These strains were inactivated by chemical and physical methods.

RESULTS AND DISCUSSION

In 2023 alone, pathological samples were collected from 577 animals and poultry in 22 livestock farms in the Kashkadarya, Samarkand, Navoi and Jizzakh regions to investigate bacterial infections and their distribution. Bacteriological examination identified other bacterial infections (pasteurellosis, salmonellosis, diplococcosis and streptococcosis), while colibacillosis was detected in three farms. In poultry, colibacillosis occurred separately and in mixed infections with pullorosis and eimeriosis.

Colibacillosis was studied mainly in 1–120-day-old calves, lambs and chicks in acute, chronic and toxicoseptic forms. In adult animals and poultry, chronic and latent forms of the disease were observed. All species of young animals are susceptible to colibacillosis.

Newborn animals may become diseased from the first day of life. Calves are mainly affected at 2–7 days of age; lambs from the first day of life up to 5–7 months; piglets at 1–7 days of age and after weaning; foals from the first day of life; and young fur-bearing animals mainly at 1–5 days of age and less frequently at 6–10 days.

The causative agent is widespread in nature and has been isolated not only from diseased animals but also from the gastrointestinal tract of healthy animals. The main sources of the causative agent of colibacillosis are diseased and recovered animals. Adult animals may also shed enteropathogenic Escherichia, and calves and lambs may become infected in the uterus. Escherichia are excreted with feces by diseased animals and contaminate the environment.

In sheep and chickens, losses during chronic colibacillosis may reach 10%. During this period, egg production in laying hens decreases by 8–23%, 75% of eggs are unfertilized, and hatching is delayed by 12–36 hours. About 11% of chicks emerging from eggs are affected by colibacillosis. In 25 examined poultry farms in our country, 10–30% of chickens were found to have colibacillosis.

In young animals, colibacillosis occurs in septic, enterotoxemic and enteritic forms.

DIAGNOSIS

Diagnosis is based on epizootiological data, clinical signs, pathological changes and bacteriological examination results. Bacteriological examination consists of two main stages:

- Preparation of smears from pathological material and microscopic examination.
- Inoculation onto Endo, Levin, GPB and Simmons media to obtain a pure culture.
- When necessary, conducting a biological test.

TREATMENT

After the disease is diagnosed, treatment begins with dietary measures: instead of milk, boiled and cooled physiological saline is administered, and chicken egg is mixed with strongly brewed black tea. Calves, lambs and piglets are treated according to the instructions with monovalent hyperimmune serum against colibacillosis prepared at the VRI; bivalent serum against colibacillosis and salmonellosis; and polyvalent hyperimmune serum against colibacillosis, salmonellosis and pasteurellosis. Their effectiveness increases when used together with antibiotics. Antibiotics listed in the source include

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synthomycin, chloramphenicol, terramycin, kanamycin, gentamicin, tetracycline, ampicillin, monomycin, Norflox-200, Nitox-200, lincomycin, lecomycin and enrofloxacin.

PREVENTION AND CONTROL MEASURES

• The farm territory should be fenced.

• Continuous duty/watch service should be organized.

• Disinfection barriers and disinfection mats should be properly established.

• During the third stage of pregnancy, pregnant animals should not be given silage, haylage, acidic or fermented feeds.

• Young animals should be provided with ABK, PABK and gastric juices.

• In unhealthy farms, 1.5–2 months before parturition, concentrated GOA vaccines prepared at the VRI should be administered according to the instructions: associated vaccine against colibacillosis and salmonellosis, and polyvalent GOA vaccine against salmonellosis and pasteurellosis.

• Measures should be established to increase the resistance of young animals and eliminate various stress factors.

• Colostral immunity lasts 20–30 days; therefore, young lambs at 1–2–5 months of age should be vaccinated. All these measures should be carried out fully and properly.

CONCLUSION

Zoohygienic standards in buildings must be fully ensured; concentrations of harmful gases must not exceed permissible levels; disinfection, deratization and disinsection must be carried out on time and with good quality; veterinary examinations must be conducted every 10 days; rations must fully meet requirements; general and specific preventive measures must be implemented on time; and newly introduced animals and poultry must be kept in quarantine for 30 days. Proper implementation of these measures will ensure the prevention of coliinfectious diseases.

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