

"Enteroaviglob-2" Veterinary Drug Based on Transovarial Chicken Immunoglobulins

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Abstract:

The article discusses the findings of scientific study into the creation of tools and procedures for the particular prevention and treatment of viral respiratory and gastrointestinal illnesses in calves with viral-bacterial etiology. The veterinary medication Enteroaviglob-2 was created from the retrieved eggs by immunizing 25 laying hens with vaccinations against viruses, viruses, and bacteria.

Keywords: transovarial, immunoglobulin, laying hens, egg, yolk, vaccine, virus, bacterium, Enteroaviglob-2, drug, RNGA, antibody titer

Introduction

Infectious gastrointestinal disorders of early age hold a large place among calves' diseases, which are prevalent in a number of farms in Uzbekistan and inflict considerable economic harm to farms and diminish livestock revenues.

Fighting these diseases successfully is only possible if there are solid methods of targeted therapy and prevention. The invention of a technology for the treatment and prevention of viral-bacterial enteritis in calves using immunoglobulins extracted from the yolk of vaccinated hens - IgY (yolk immunoglobulin) - is particularly remarkable. According to a review of the literature, medications based on transovarial immunoglobulins can be utilized to treat viral respiratory and gastrointestinal illnesses in calves of viral-bacterial origin. [1,2,3,4,9].

At the moment, the creation of medications based on transovarial immunoglobulins is regarded as the most promising and successful [5,7,8,6].

Oral antibody transfer is the best therapy option for infections of the gastrointestinal system in humans and animals. The immunity established by passive vaccination lasts just a short time while the antibodies stay in the body, but it gives rapid protection and is useful in acute infections. Passive vaccination is becoming a preferred alternative to antibiotics when germs get resistant to them. It is more cost effective to generate standardized medications based on IgY antibodies with varying specificities than numerous distinct pharmaceuticals produced using different technologies. There are many publications on the use of avian antibodies for passive immunization as therapeutic and prophylactic drugs for humans and animals [10,11].

Purpose and objectives of the research

Development of techniques and methods for the targeted treatment of viral respiratory and gastrointestinal illnesses in calves with a viral-bacterial etiology. To create a veterinary medication called "Enteroaviglob-2" using transovarial immunoglobulins extracted from chicken eggs inoculated with antiviral and viral-bacterial vaccinations.

Methodology

The research was conducted out at the Samarkand State University of Veterinary Medicine, Animal Husbandry, and Biotechnology's Department of Microbiology, Virology, and Immunology, the VITI Microbiology Laboratory, and the K. Eldor farm in the Samarkand region. Transovarial immunoglobulins were obtained from two groups of 25 laying hens, one experimental and one control.

The veterinary drug "Enteroaviglob -2" was prepared from the egg yolks of experimental chickens hyperimmunized with the associated inactivated vaccine against viral diarrhea, rota and coronavirus infections, colibacillosis and proteosis of calves "Enterovak - 5" and associated; live vaccine against infectious rhinotracheitis, viral diarrhea, parainfluenza-3, respiratory syncytial infection of cattle "Tetravir - 4" according to the scheme we developed intramuscularly in a dose of 2.0 ml (administration of vaccines simultaneously in different places).

According to the same scheme, chickens in the control group were injected with physiological solution intramuscularly in a dose of 2.0 ml simultaneously in different places.

Eggs from experimental laying hens were collected and kept at a temperature of +3...+5°C 14 days after the injections were completed. The yolk of the resultant eggs was then separated from the white, diluted three times with a sterile isotonic sodium chloride solution, stored, and packed in sterile bottles of 100, 200, and 400 ml.

An indirect hemagglutination test (IDHA) was employed to assess the quantity of antiviral antibodies in the yolks of vaccinated hens. The chicken eggs were utilized in the study before vaccination, 14, 28, and 42 days later. To separate immunoglobulins from yolk lipids, the yolk was diluted in a 1:1 ratio with a sterile isotonic sodium chloride solution and purified aviation gasoline was added to it, carefully resuspended and placed at +2+5°C for 3-5 days. Next, the settled immunoglobulin was decatified and used to perform immunological reactions (RIGA).

Results

As a result of the research, for the first time in Uzbekistan, the veterinary drug "Enteroaviglob-2" based on transovarial immunoglobulins was developed and introduced into production for the specific prevention and treatment of viral respiratory, viral infections from eggs obtained from laying hens hyperimmunized with antiviral and viral-bacterial vaccines according to a proven scheme. - Calves with bacterial gastrointestinal illnesses.

According to the findings of a chicken immunization study, there is a considerable manufacture of antiviral and antibacterial antibodies in the yolks of hens inoculated with the Tetravir-4 and Enterovak-5 vaccines. Thus, the amount of antibodies in chicken yolks to the infectious rhinotracheitis virus grew by 42 days compared to the baseline data, diarrhea increased by 6 times, parainfluenza increased by 8 times, RS virus increased by 9 times, rotavirus increased by 8 times, and coronavirus increased by 8 times.

When compared to the original results, the amount of antibodies in chicken yolks increased by 5 times for *E. coli* K88, 4.4 times for *E. coli* K99, 3.8 times for *E. coli* 987P, 4.6 times for *E. coli* F41, A20, and 4.2 times for *Pr. mirabilis*.

The egg immunoglobulins generated in this manner have a sufficiently high amount of antibodies to allow calves to destroy viruses and bacteria in the intestines and have a strong therapeutic impact when provided orally.

The veterinary drug "Enteroaviglob-2" is based on chicken transovarian immunoglobulins and contains specific antibodies against viruses of infectious rhinotracheitis, diarrhea, parainfluenza-3, respiratory syncytial-, rota-, and coronaviruses, colibacillosis, and calf proteosis in titers of more than 6.0 log₂ to each causative agent of viral and bacterial infections included in vaccines. The results show that hens inoculated with the Enterovac - 5 and Tetravir - 4 vaccines produced a significant level of antibodies. Antibody titers in non-immunized hens were 3-4 log₂, showing substantial levels of natural antibodies in the yolks.

The veterinary medication Enteroaviglob-2 seems to be an opaque suspension; it is a homogenous yellow emulsion of varied intensity free of external contaminants and mold. In sterile glass bottles with rubber stoppers and rolled in metal tops, nominal quantities of 50.0, 100.0, 200.0, or 400.0 cm³ are produced.

Transport and store in a dry, light-protected environment at temperatures ranging from +4°C to +8°C. The shelf life of the veterinary medicine Enteroaviglob-2 is 12 months from the date of manufacturing, subject to storage and transit circumstances.

"Enteroaviglob-2" is a medication with therapeutic and preventative characteristics that is both nontoxic and areactogenic.

Passive immunity continues in animals following administration of the medication "Enteroaviglob-2" for 7 days. It has a stimulating impact, raises immunoglobulin levels in calves with hypogammaglobulinemia, and boosts the body's natural resistance.

Conclusion. The developed technology for the production of the veterinary drug "Enteroaviglob-2" based on transovarial immunoglobulins obtained from chicken eggs hyperimmunized with the associated inactivated vaccine "Enterovak-5" and the associated live vaccine "Tetravir-4" allows for

a high level of antibodies in chicken yolks, more than $6.0 \log_2$ in RINGA. It has been demonstrated that transovarial immunoglobulins are a very active and cost-effective source of antibodies against viral and bacterial infections in animals, allowing for the development of efficient medications for the passive prevention and treatment of pneumoenteritis in animals.

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