

ANIMAL HUSBANDRY

THE INFLUENCE OF PROPOLIS ON THE NATURAL RESISTANCE OF ORGANISM OF LARGE CATTLE

Conflict of Interest

None declared.

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Associate editor: Alautdin Aliev

Received on 20 July 2017, revised on 30 July 2017, accepted on 04 August 2017.

Abstract

The effectiveness of the use of propolis drug on the state of nonspecific resistance of animals, which was manifested in the restoration of the leukocyte formula, bactericidal and lysozyme activity of the serum to the physiological norm that was significantly altered in cows with purulent-catarrhal postnatal endometritis, is shown in the work. Clinical parameters are confirmed by physiological characteristics.

Keywords: cows, endometritis, propolis, Propomast, insemination.

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One of the factors of cows' infertility is acute postpartum endometritis. Many different drugs are used today to treat and prevent endometritis in cows; they contain single and combined antibacterial substances (antibiotics, sulfonamides, nitrofurans, hormones, etc.). Many of the drugs used in such cases have lost their effectiveness, and due to their long-term use, microorganisms have developed drug resistance. In addition, the use of a wide range of chemotherapeutic drugs without proper immunological control also contributes to reducing the natural resistance of the organism and the development of immunodepression in animals (Andreeva, 2002, Makarov, 2010).

In this regard, drugs made from natural raw materials are of great interest; these drugs after introducing to body of animal cause an adaptogenic effect. Biologically active product of beekeeping – propolis is possible to classify as such medicinal preparations. Propolis drugs have immunostimulating, antibacterial and antiviral action (Derjugina, 2012, Derjugina et al., 2016).

The aim of the work was to evaluate the effect of propolis drug "Propomast" on the indices of natural resistance of the cows' organism in case of treatment of acute postpartum purulent-catarrhal endometritis.

Object and methods of research

Experimental and research-and-production studies were carried out on the basis of ACJSC "Bereznikovskoe" of the Dalnekonstantinovsky district of the Nizhny Novgorod region.

To study the therapeutic effectiveness of the propolis drug, two groups of black-and-motley breed cows at the age of 4-6 years were formed with 15 heads in each. The first

group included clinically healthy animals with normal course of labor and postpartum period.

The second and third groups included cows with postnatal purulent-catarrhal endometritis.

The animals of the second group were intrauterine injected with the preparation "Propomast" (TS 08064-19-53-95) in a dose of 100 ml in a complex with 2% Synoestrolum solution, 30E oxytocin and Trivit®, the solutions were administered intramuscularly. Treatment was carried out daily until a clinical recovery.

Therapeutic efficacy of the drugs was determined by the change in the general state of animals, the condition of reproductive organs and mucous membrane of the genital tract, and by the nature of the uterine secretions. The study was considered complete after the end of involution of genital organs and the appearance of excitation stage of the sexual cycle.

To study the indices of natural resistance, the leukocyte formula, bactericidal and lysozyme activity of serum were analyzed by standard clinical methods [6].

Statistical processing of the obtained results was carried out using the Statistica 6.0 application packages for Windows 98.

Results of the research. The number of leukocytes in the purulent-catarrhal postnatal endometrium increased (Table 1). In the leukogram of sick animals it was detected an increase in the number of basophils, eosinophils, immature forms of neutrophils, such as metamyelocytes and stab neutrophils, and a decrease in the number of segmented neutrophils ($p < 0.05$).

Table 1 – Leukocyte formula of blood of cows with endometritis before and after treatment

Parameter	Group I (control group)	Group II	
		before treatment	after treatment
Leucocytes, 10 ⁹ /l	7.14± 0.23	15.32± 0.18*	7.05± 0.20
Granulocytes, %	36.75±1.22	39.68±1.28*	37.71±1.26*
Agranulocytes, %	63.25±1.25	60.32±1.30*	59.31±1.23*
Granulocytes, %			
Neutrophils	29.51±1.19	29.51±1.19	29.55±1.10
Metamyelocytes	0.33±0.11	0.33±0.11	0.91±0.18*
Stab neutrophils	3.9±0.39	3.9±0.39	8.25±0.35*
Segmented	25.28±1.16	25.28±1.16	20.39±1.20*
Eosinophils	5.29±0.59	5.29±0.59	5.91±0.64*
Basophils	1.95±0.26	1.95±0.26	4.22±0.19*
Agranulocytes, %			
Monocytes	4.13±0.38	6.74±0.36	4.19±0.29
Lymphocytes	59.16±1.09	53.58±1.07	55.12±1.06

Note: * p<0.05 in comparison with control group of animals.

The results of the study show that in cows with postnatal purulent-catarrhal endometritis there is an acute inflammatory process complicated by infection. The shift of the leukocyte formula to the left indicates the development of the regenerative process, with a decrease in segmented neutrophils number and an increase in the number of eosinophils and basophils associated with the chronicization of the process of inflammation in the genital organs.

After treatment, the number of eosinophils, basophils and monocytes decreased, marked neutrophilic leukocytosis with a shift to the right was noted. These changes in the composition of white blood indicate an increase in cellular factors of resistance of the cows.

Confirmation of animals' natural resistance increase after treatment with propolis was obtained after studying of bactericidal activity of blood serum. After treatment, the increase was observed from 52.5 + 0.68% to 60.1 + 0.78%.

Since the bactericidal activity of blood serum is determined by many factors, including lysozyme, it was important to identify the specific role of lysozyme in maintaining the humoral nonspecific resistance of the cows' organism against the background of using the propolis drug. The lysozyme activity of the blood serum of the animals from the control group was 11.6 ± 0.16%, in the second group of animals this indicator was 9 ± 0.12%. After treatment, the lysozyme activity of serum increased to the level of control animals.

Thus, after treatment, the observed parameters were restored to the level of physiological norm.

The propolis drug significantly influenced the reproductive function of cows. It was found that in animals the positive shifts in the course of the disease occurred on the 4th-5th day. By this time, the signs of inflammation of the genital tract weakened; endometrium inflammation transferred into a catarrhal form. Uterine rigidity has recovered on the second or third day of treatment, active evacuation of the exudate

from the genital tract was observed. Active retraction of the uterus was marked during the following days.

Thus, an inflammatory reaction develops in cows with postnatal purulent-catarrhal endometritis, treatment of which is expedient to be carried out using adaptogens, in particular propolis. Propolis promotes the activation of cellular immunity, correction of immunodeficiency state.

Propolis due to the content of flavonoids reduces oxidative processes and thereby reduces the destruction of membranes of organs and systems of the body. In addition, the introduction of propolis into the body can stimulate the release of glucocorticoids, and thereby limit the development of stress reaction associated with the process of inflammation in animals (Derjugina, 2012, Ivashchenko, 2002).

The increase in the adaptive mechanisms by propolis, contained in the preparation "Propomast", provides a sufficiently pronounced therapeutic effect during the treatment of cows with cervical endometritis, complete recovery with restoration of the reproduction function.

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