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Trifuzol Suppositories Usage Results On The Course Of Endometrial Inflammatory Processes In Cows.

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ABSTRACT

The purpose of the study was to determine the effect of the active substance piperidinium 2-(5-(2-furyl)-4-phenyl-1,2,4-triazole-3-ylthio)acetate in the suppository form on the course of endometrium inflammatory processes in cows. Subsequently, this drug is planned for the industrial release and sale on the Ukrainian and foreign pharmaceutical markets of veterinary medicines.

Keywords: suppositories, treatment, cows, trifuzol, biochemical analyzes.

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INTRODUCTION

Intensification of dairy herd reproduction in farms with different forms of ownership is particularly important and scientifically grounded in today's economic conditions of free market system. Only in conditions of rhythmic and optimized obtaining of healthy offspring from cows can create a healthy and highly productive uterine herd. This will allow to abandon from the annual replacement of up to 30% of the uterine herd and approach to the countries with developed dairy farming where high-yielding animals are used up to 5-7 lactations [1].

Despite the undershoot of cattle farms in the process of the agriculture reforming in Ukraine, reproductive system diseases of cattle remain the number one issue for veterinary medicine specialists. This is due to the fact that in the reorganized collective farms the traditional

milk production technology is used, biogeocenoses are preserved in the course of the evolution, including animals and associations of opportunistic pathogenic bacteria, which cause mastitis and endometritis in cows [2].

Endometritis (metritis) is the most common form of post-partum pathology in cows, which can be massive and cause significant economic damage to the farm and the state as a whole [3, 4, 5, 6].

In essence, endometritis is an infectious process and the development of purulent process in the uterus indicates that for microorganisms and their associations that inhabit the body or got from the outside, the optimal conditions for rapid reproduction have been created for the manifestation of pathogenic properties. The most common in the fight against this pathology has the direction called chemotherapy. It is based on the application of bactericidal and bacteriostatic agents. However, chemotherapy, as a method of disinfecting the pathogen, can also be detrimental to macroorganism, causing metabolic disorders, degradation of parenchymal organs, distorting the body's immune response etc.

Therefore, the treatment of endometritis should be based on the principle of integrated and sequential use of agents with ethiotropic, pathogenetic and symptomatic action, taking into account the phase of injury, individual reactivity, concomitant diseases etc. [7, 8, 9, 10]

In the basis of complex influence on the cows organism with endometritis is the use of ethiotropic agents (elimination of the pathogen), the most common and effective of which are antibiotics. There is no doubt that the application of antibiotics should be started from identifying the pathogen and determining its sensitivity to drug.

However, unfortunately, an objective bacteriological study, including antibiotic susceptibility pattern, may be obtained only in a few days, whereas the treatment of any purulent process should be urgent. Therefore, in practice, antibacterial drugs should be prescribed empirically, which may lead to the selection of multiresistant strains of microorganisms, and in some cases the opportunistic pathogenic microflora acquires the properties of pathogenic germ.

Thus, antibiotic therapy for endometritis should reach a steady clinical recovery in the shortest possible time with minimal and inverse functional disorders of the organs, tissues and homeostasis of the organism.

Simultaneous application of antimicrobial drugs and agents with pathogenic effect increases their antimicrobial effect and improves the portability of chemotherapeutic agents by normalizing the metabolism and activating the factors of organism immune protection.

Immunocorrection and homeostasis restoration of the diseased cows include the use of stimulant, substitution and pathogenetic therapies. The cows organism in the post-natal period is under the active influence of stress factors, tension of metabolic processes etc. Therefore, it is necessary to reduce the endocrine imbalance as soon as possible, to normalize the function of the ovaries, to activate hemopoiesis and factors of the natural resistance of the organism [11].

The achievements of modern clinical immunology have proven the autoimmune nature of the endometritis pathogenesis, which can be seen as the disorder of cellular immunity and other parts of the body's defense, accumulation of "pathogenic" immune complexes, sensitization etc. Consequently, it should be mentioned about the necessity of immune stimulation of the sick cows body [2, 12].

In order to reduce the stress burden and its effects on the body of post-natal cows, it is recommended to use stimulant therapy, which is necessarily supplemented with improved nutrition and retention conditions. According to this purpose cows are injected with tissue extracts (by Filatov), aqueous solutions and oil emulsions of the agent ASD-f-2, hemotherapy and blood products (leucocytal plasma, non-specific serum, UFOC) are applied, lactic therapy, ichthyolotherapy etc. [13, 14].

In view of the fact that different farms use different animal treatment schemes, the results of the treatment with intra-uterine trifuzol [15] suppositories were received and analyzed for the first time.

MATERIALS AND METHODS

The industrial test of intrauterine suppositories "Trifuzol" was conducted in the conditions of the dairy farm of the industrial agricultural cooperative "Zlagoda" from November 27, 2017 to December 08, 2017, about which the relevant act was signed.

For the purpose realization the experimental group was formed from cows which suffer from chronic catarrhal endometritis. In the animal anamnesis they were infertile, general clinical signs were absent, mucous exudate periodically secreted from the birth canals. In the clinical studies opaque mucus with impurities of catarrhal effusion was present. The cervix channel was opened to one or two fingers. The mucous membrane of the cervix was enlarged (Fig. 1).



Fig1: Preparation for the administration of trifuzol suppositories to cows which suffer from chronic catarrhal endometritis

For the therapeutic purposes animals were administered via cervical canal of the uterus with suppositories which contain piperidine 2-(5-(2-furyl)-4-phenyl-1,2,4-triazole-3-ylthio)acetate for two suppositories with an interval of 24 hours (4-5 times) (Fig 2-3).



Fig 2: Application of suppositories to the cervix



Fig 3: Pushing of the suppository into the uterine cavity

Oxytocin (30 units of activity) was injected intravenously to enhance uterine motility for five consecutive days. As an agent of pathogenetic therapy, intra-aortal administration of 0.5% novocaine solution (200 ml) in combination with trifuzol (1 ml/20 kg) was applied once (Fig. 4).



Fig 4: Intra-aortic administration of 0.5% novocaine solution of Trifuzol with Jane syringe

Subsequently, intramuscular administration of Trifuzol was continued (1 ml/20 kg) (Fig. 5).



Fig 5: Intramuscular injection of Trifuzole

Prior the treatment and at the end of the therapeutic course, blood samples were collected after administration of v. jugularis ext. for general clinical analysis and deployed biochemical study (Fig. 6-7).

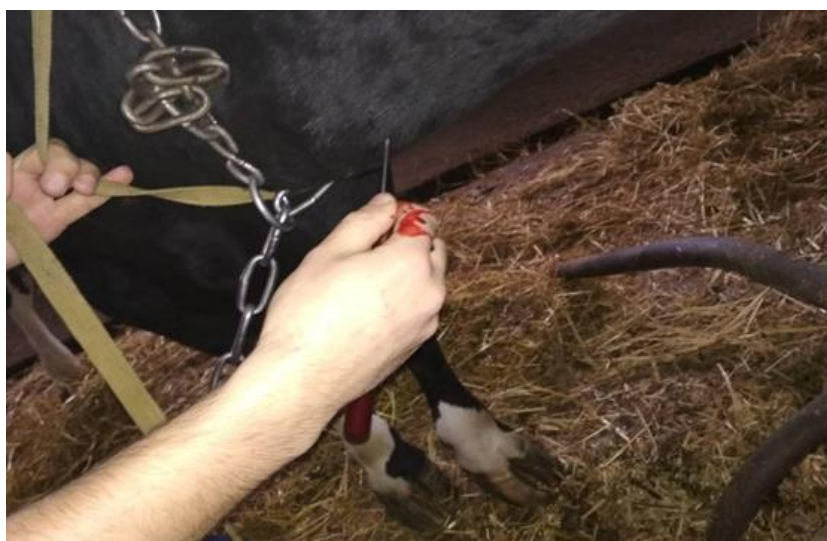


Fig 6: Puncture venae jugularis externa



Fig 7: Puncture of the abdominal aorta by I. I. Voronin

For comparison blood samples were taken from the same number of clinically healthy cows (Fig. 8).



Fig 8: A blood sample of clinically healthy cows for the testing

An automatic biochemical analyzer Sapphire 400 was used for complex analysis of the blood of diseased and healthy animals, as well as animals after treatment.

RESULTS AND DISCUSSION

The results of general and detailed biochemical blood tests are presented in Tables 1, 2.

Table 1: Dynamics of clinical indices of cows blood

Indices		Clinically healthy cows	Cows suffering from endometritis, before treatment	Cows suffering from endometritis after a course of treatment
Hemoglobin, g/l		95,67±6,30	90,00±8,40	115,0±4,2
Erythrocytes, T/l		5,40±0,08	3,37±0,08	5,40±0,12
Color indicator		0,87±0,03	0,80±0,04	0,89±0,02
Leucocytes, g/l		6,60±0,25	11,80±0,63	7,80±0,25
ESR, mm		1,20±0,84	3,30±0,42	1,30±0,42
Neutrophils	Myelocytes, %	-	-	-
	Metaemyelocytes, %	-	-	-
	Rod Nuclear Cells, %	3,67±0,42	1,67±0,42	3,30±1,26
	Segmented nuclei, %	35,00±5,46	43,67±6,72	30,00±4,20
Eosinophils, %		6,33±0,42	6,67±0,84	4,30±0,84
Basophils, %		-	-	-
Lymphocytes, %		45,30±3,78	69,00±2,94	45,00±3,36
Monocytes, %		4,67±2,52	8,00±2,52	6,30±1,26

Table 2: Dynamics of biochemical indices of cows blood

No	Indices	Clinically healthy cows	Cows suffering from endometritis, before treatment	Cows suffering from endometritis after a course of treatment
1	Albumin, g/l	40,00±1,68	33,30±1,26	42,30±2,10
2	Total protein, g/l	74,67±1,68	70,30±4,20	81,30±6,30
3	Alkaline phosphatase, Mo/l	167,00±19,74	253,30±61,76	190,30±23,94
4	AlAt, Mo/l	22,30±5,46	17,67±3,78	19,00±4,20
5	AsAt, Mo/l	70,67±12,60	47,00±10,08	43,30±12,60
6	LDH, Mo/l	2508,0±257,9	1930,00±115,96	1921,00±72,68
7	GGTP, Mo/l	31,00±7,56	27,00±2,52	30,00±2,10
8	Creatinine, µmol/l	90,30±15,96	134,30±7,98	101,70±6,30
9	Urea, mmol/l	20,57±0,34	14,50±0,34	33,50±1,26
10	Glucose, mmol/l	2,76±0,54	2,43±0,34	3,36±0,25
11	Cholesterol, mmol/l	4,37±1,61	5,80±0,59	4,59±0,50
12	Triglycerides, mmol/l	0,79±0,09	0,45±0,01	0,46±0,03
13	α-amylase, Mo/l	22,67±6,72	48,30±17,64	37,67±12,60
14	Bilirubin total, µmol/l	03,30±0,04	20,00±0,84	04,30±0,10
15	Bilirubin direct	7,30±2,94	5,00±0,84	8,30±2,10
16	Bilirubin indirect	16,00±2,10	15,00±0,01	16,0±0
17	Tymol test, unit.	1,37±0,12	1,20±0,08	1,67±0,25

18	Urinary acid, $\mu\text{mol/l}$	19,30 \pm 4,62	29,67 \pm 4,62	39,67 \pm 9,66
19	Inorganic phosphorus, mmol/l	1,7 \pm 0,25	1,39 \pm 0,22	1,43 \pm 0,14
20	Calcium, mmol/l	2,4 \pm 0,1	2,32 \pm 0,06	2,34 \pm 0,15
21	C-reactive protein	negative	negative	Negative
22	ASL titre, un.	< 250 un.	< 250 un.	< 250 un.
23	Seromukoids, un.	0,126 \pm 0,004	1,60 \pm 0,017	1,116 \pm 0,008
24	Revomfactor	negative	negative	Negative
25	Albumini, %	45,50 \pm 1,26	46,80 \pm 1,13	40,23 \pm 5,50
26	Globulins, %	54,50 \pm 1,26	53,20 \pm 1,13	59,77 \pm 5,50
27	Coefficient Alb./Glob.	0,83 \pm 0,04	0,88 \pm 0,04	0,68 \pm 0,15

CONCLUSIONS

- Intrauterine administration of suppositories with piperidine 2-(5-(2-furyl)-4-phenyl-1,2,4-triazole-3-ylthio)acetate does not have a negative impact on the clinical parameters of the cows, main blood indices and productivity indicators. Suppositories are safe, do not degrade the quality of dairy products.
- The use of piperidine 2-(5-(2-furyl)-4-phenyl-1,2,4-triazole-3-ylthio)acetate in the form of intrauterine suppositories (2 suppositories with an interval of 24 hours, five days) during catarrhal endometritis in cows in combination with agents of pathogenetic and replacement therapy can improve the course of the pathological process and individual blood indices. In particular, there is a decrease or discontinuation of the periodic defluviu of the mucous membrane exudate, a tendency towards a decrease in the lumen of the cervical canal. There is also a tendency to increase hemoglobin content, total protein (due to increase of specific gravity of globulins), tendency to normalize the activity of enzymes – alanine aminotransferase, gamma-glutamyltranspeptidase, α -amylase.

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