

APPLICATION OF LYDIUM KLP (DIMER OF LYSOZYME) IN TREATMENT OF INFLAMMATION OF ENDOMETRIUM IN COWS.

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INTRODUCTION

Inflammation of endometrium (endometritis), disturbances in involution of the uterus and prolonged open period are the most frequent disturbances of procreation of the cows in after calving period. They make a remarkable health and economical problem in breeding of cattle in big herds, being a subject of investigations in many countries (1,3,7). Many authors relate the occurrence of endometritis with ovarian disfunction (1,7), others - with involution of the uterus (2,3), retention of placenta (3), while only few attribute these disturbances to worsening of natural defensive reaction of the female (2,6). Complex ethiology of the syndrom of these diseases and insufficient therapeutic results prompt to seek new and more effective therapeutic preparations, particularly beside the group of antibiotics, that could allow to utilize the milk in the therapeutic period. In the hitherto existing procedure of treatment of endometritis the antibiotics have been preferred (1,3,7). More recently, beside traditional procedure of treatment of endometritis in cows some new preparations have been elaborated, stimulating different mechanisms of immunity system of the organism. These preparations are determined as biologically active immunomodulators. Lydium KLP - a dimer of lysozyme (muramidase) - makes a part of them.

The work was aimed at appraisal of efficiency of treatment of endometritis postpuerperalis by means of the preparation Lydium-KLP (Nika Health Products Ltd.) and comparison with the effects of traditional treatment, with the use of antibiotics.

MATERIALS AND METHODS

The researches comprised 140 cows in which during a clinical examination of reproductive organs, effected in puerperium the endometritis of 1st and 2nd kind (E₂-E₃) was found. Experimental group (I) comprised 90 cows, control group included 50 cows. The cows of experimental group have been subject to intrauterine administration of Lydium KLP, once or twice, in the amount of 2 mg of active substance in 10 ml of the solution, in the form of intrauterine perfusion of the volume 150 ml. The cows of control group obtained antibiotics in the form of intrauterine perfusion. In both groups clinical and gynecological control of the treatment was performed, with the attention paid to: the condition of the uterus and uterine cervix, the process of involution, filling of the uterus cavity, the amount, character and smell of the floods of reproductive organ, activity of ovaries and restitution to physiological condition of the uterus. Estimation of the results of treatment in particular groups was made by comparison of the following factors: the number of healed and fertilized cows in 1st and 2nd group, average open period, insemination index, the time of uterus involution. To complete the clinical and gynecological examinations also bacteriological examinations of the secretion collected in outer

orifice of uterine cervix before the treatment and after its completion were made according to required procedure (common agar with the blood, McConkey's basis) as well as analysis of the milk, performed in order to search inhibitor contents.

RESULTS

Intrauterine infusion of Lydium KLP in 24 to 36 hours resulted in evident changes of amount and smell of floods from reproductive tracts of the cows. In gynecological examination, in 3rd and 7th day after the infusion of Lydium KLP a clearly processing involution of the uterus was observed, growth of its tonus and decrease of its contents. In the same time in the cows of control group only slight changes of the kind, amount and smell of floods of reproductory ducts were observed, moreover, much slower involution of uteru was noticed, with much lower rate of growth of the tonus. In the swabs from reproductive tracts of the cows, made prior to the treatment in both groups, the presence of microorganisms from *Staphylococcus* sp., *Streptococcus* sp., *Enterococcus* sp., *Clostridium perfringens* and *E.coli.* was ascertained. After the treatment, in the cows of experimental group obtaining Lydium KLP a statistically significant decrease ($p < 0.01$) of total number of microorganisms was stated, compared with the number noticed in the control group, in spite of ascertained sensitivity to the antibiotics. In the milk of the cows obtaining Lydium KLP no inhibitors were found. Examination of the milk of the cows of control group, performed on 2nd and 5th day after the intrauterine perfusion of the antibiotics, showed the presence of antibiotics in the milk samples. Values of analyzed factors of fertility in the cows of particular groups are presented in the Table 1.

Table 1.

Indexes	The group	
	Experimental (I)	Control (II)
Number of cows	90	50
- recovered $\frac{\text{number}}{\%}$	$\frac{77}{85.5}$ $\frac{90}{100}$	$\frac{31}{62.0}$
- fertilized $\frac{\text{number}}{\%}$	$\frac{82}{91.1}$	$\frac{36}{72.0}$
Time of involution of the uterus days	39.8 ± 4	48.4 ± 5
Insemination index	1.36 - 1.42	1.9 - 2.4
Inter pregnancy time days	86.0 ± 6.0	112.0 ± 9.0

DISCUSSION AND CONCLUSIONS

The preparation Lydium KLP used in the treatment of endometritis in cows showed high therapeutic efficacy, compared with the therapy effected with antibiotics (7). Particularly clear is the number of fertilized cows regarding used therapy. In the 1st group 91.1% of the cows entered in the next reproduction cycle, while in the 2nd group this rate amounted only to 72.0%. In the group of the

cows, which have been given Lydium KLP the average involution period was shorter by 9.5 days, secretion activity of the ovaries after delivery was undertaken earlier in these cows. Considerable shortening of the time between pregnancies, on the average by 26.0 - 9 days in the cows from the group I is a reflection of the process of convalescence of reproductive organs in result of application of the treatment, which has initiated a defense mechanism of the organism, as Lydium KLP is a natural immunotherapeutic drug of stimulative action (4,5). It activates a phagocytic processes, intensifies production of interferon alpha by lymphocytes and inhibits creation of necrotic agent TNF beta (4,6). Presented data allow to ascertain that the biologically active immunomodulator Lydium KLP, applied for treatment of endometritis in cows showed better therapeutic efficiency, shortened the convalescence time of reproductive organs and speeded up in treated females the next reproductive cycle, as compared with antibiotics used in a traditional process of the treatment of this clinical syndrome.

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SUMMARY

The investigations included 140 cows, in which endometritis of II and III (E₂-E₃) was ascertained. 90 cows of experimental group (I) obtained intrauterine dose of Lydium KLP, once or twice, in the amount of 2 mg of active substance in 10 ml of the solution. 50 cows of control group (II) obtained intrauterine perfusions of antibiotics. In both groups ovarian activity was controlled, as well as restitution of the uterus to physiological state. Appraisal of the treatment in particular groups was effected by comparison of the following indexes: the number of recovered and fertilized cows within a group, average inter-pregnancy period, and insemination index. It was shown that efficiency of the treatment after one administration of Lydium KLP amounted to 85%, after the administration repeated twice the efficiency grew to 100%. In the 2nd group the efficiency was 62.8%. Average time of involution of uterus in the cows of 1st group amounted to 39.8 ± 4 days, and efficiency of fertilization - 91.7% and 72%. Insemination index in the 1st group fluctuated from 1.36 to 1.42 and open period was shorter by 26 ± 9 days. Insemination index in the 2nd group fluctuated from 1.9 to 2.4. In the milk of the cows of experimental group (obtaining Lydium KLP) no inhibitors were found, while the milk of the cows of control group contained the inhibitors.

ZUSAMMENFASSUNG

Die Untersuchungen umfaßten 140 Kühe, bei denen Endometritis des II und III Grades festgestellt wurde. 90 Kühe aus der Versuchsgruppe (I) haben in die Gebärmutter Lydium KLP bekommen, einmal oder zweimal in Mengen von 2 mg der aktiven Substanz in 10 ml Lösung. 50 Kühe aus der Kontrollgruppe (II) haben in die Gebärmutter eine Antibiotikainfusion bekommen. In beiden Gruppen hat man die Ovarialfunktion und die Rückkehr der Gebärmutter zym physiologischen Status kontrolliert.

Die Beurteilung der Behandlungsergebnisse in einzelnen Gruppen hat man aufgrund des Vergleichs folgender Leitzahlen: die Zahl der ausgeheilten und befruchteten Kühe in der Gruppe, die durchschnittliche Zwischengeburtszeit, Index der künstlichen Besamung. Man hat nachgewiesen, daß die Wirksamkeit der Aushelung der Kühe nach der einmaligen Gabe von Lydium KLP 85%, und nach der zweimaligen 100% betragen hat. In der II. Gruppe - 62.8%. Die durchschnittliche Zeit der Uterusinvolutions bei den Kühen in der I. Gruppe betrug 39.8 ± 4 Tage, und die Wirksamkeit der Befruchtung 91.7% und 72%. Der Index der künstlichen Besamung in der I. Gruppe schwankte von 1.36 bis 1.42, und die Zwischengeburtszeit war um 26 ± 9 Tage kürzer, Der Index der künstlichen Besamung in der II. Gruppe schwankte von 1.9 bis 2.4. In der Milch der Khe aus der Versuchsgruppe (Lydium KLP) hat man keine Hemmungssubstanzen festgestellt. In der Milch der Kühe aus der Kontrollgruppe wurde ihre Anwesenheit nachgewiesen.

RESUME

Les investigations renfermaient 140 vaches chez lesquelles on a constaté endomitrise de 2-ème et 3-ème degré (E₂ et E₃). 90 vaches du groupe de référence (I) ont obtenu le Lydium KLP intra-utérine, une ou deux fois, en quantité de 2 mg de la substance active dans 10 ml de solution. 50 vaches du groupe de référence (II) ont obtenu la perfusion intra-utérine des antibiotiques. Dans deux groupes on a contrôlé l'activité des ovaires ainsi que restitution de l'état physiologique d'utérus. L'évaluation des résultats du traitement a été effectuée par comparaison des indexes suivants: le nombre des vaches guéris et fécondes dans le groupe, la période moyenne entre grossesses, l'index d'insémination. On a montré que l'efficacité du traitement des vaches après l'administration de Lydium KLP effectuée une fois s'élevait à 85%, tandis qu'après deux administrations l'efficacité s'élevait à 100%. Dans le groupe II le meme index était 62.8%. La période moyenne d'involution utérine chez les vaches du I-er grupe était 39.8 ± 4 jours et l'efficiencie de fertilisation 91.7% et 72%. L'index d'insémination dans le groupe I a fluctué de 1.36 1.42, dans le meme temps la période entre grossesses durait moins de 26 ± 9 jours. L'index d'insémination dans le groupe II fluctuait de 1.9 ± 2.4 . Dans le lait des vaches du group expérimental (utilisant Lydium KLP) on n'a pas trouvé des substances inhibiteurs, tandis que dans le lait des vaches du groupe de référence les inhibiteurs étaient présents.