

# **SURFACE DOGS PYODERMA TREATMENT WITH NANOQUACHELATES OF METALS**

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*There were clinical research of a new antiseptic ointment Nanosept which includes nanoquachelates silver and copper and iodine solution. Effective antimicrobial action of the drug Nanosept with pyoderma dogs was detected compared to traditional choice Chemi-spray and Sanoderm.*

**Tags:** *dogs, pyoderma, diagnosis, nanoquachelates of metals, treatment.*

Pet skin diseases nowadays are becoming spreader. According to literature, they are about 20% of all applications for veterinary care [1, 3]. Their occurrence is associated with violation pet climatic features of the region, unbalanced nutrition and other factors. The most spread and dangerous dermatological problem is pyoderma [4, 5], as patients are difficult to treat and dogs constitute a danger to humans, and their housing because of unpleasant appearance is problematic.

The spread of pyoderma contribute among other factors and disadvantages diagnosis and inappropriate use of antibiotics as prescribed without recent study of sensitivity to these agents. This caused to resistant strains of pathogens among dog population.

The actual problem is the invention more active and sustained forms of antibacterial agents to treat dogs with pyoderma. Promising in this respect can be nanoquachelates of metals that have high antibacterial properties.

The aim of our research - determine the positive effect of our new drug (ointment "Nanosept") with nanoquachelates of metals in the treatment of dogs suffering from superficial pyoderma.

**Materials and methods research.** We have created a new ointment "Nanosept" based on lanolin, nanoquachelates Argentum and Copper and also iodine solution (the patent number 101,087 on 03/15/2013). Research antiseptic properties of new drug conducted in clinical trials. To do this, preliminary studies were conducted on the white laboratory rats to conducted irritating action of the

drug. Found that in 5 rats, which for 2 weeks was applied ointment "Nanosept" did not change the overall behavior, they normally ate food and gaining weight. There are no irritation (redness, hyperthermia, edema) in areas mentioned drug applied. Were indicated the absence of inflammatory reaction at the sites of drug application.

As clinical trials material were dogs suffering from acute and chronic forms of superficial pyoderma. Diagnosis was based on clinical symptoms and bacteriological research. For the experiments selected dogs of different breeds, weighing from 2 to 40kg, ages 1 to 8 years, belong to residents of the Kiev. All experimental dogs have individually diet.

Selected dogs had been formed in analogues 3 research groups. Forming groups was based on different occurrence forms of pyoderma. In the experiment were selected dogs with skin lesions no more than two adjacent anatomical sites.

In the 1st group (n = 9) included dogs suffering from acute and chronic superficial pyoderma, where used for treatment ointment "Nanosept." In the 2nd group (n = 9) included dogs suffering from acute and chronic pyoderma, where used antiseptic spray "Chemi-spray." This tool is widely used by practicing physicians in the treatment of pyoderma in animals. "Chemi-spray" contains chlorine tetracycline - 2g and hentsianviolet - 0.5 g. In the 3rd group (n = 9) included dogs suffering from acute and chronic pyoderma, which is used for treatment cream "Sanoderm." This drug is a comprehensive treatment for dogs is recommended for use in allergic, bacterial and fungal skin lesions. In 1g of the cream contains of active ingredients: 0,64mh betamethasone dipropionate, 1mg of gentamicin sulfate, 10mg clotrimazole.

Before treatment of dogs with active inflammation were observed irritation, pain, itching, swelling, multiple pustules. Drugs were applied 2 times a day, with an interval of 12 hours, capturing all areas of inflamed skin and the border to complete disappearance of superficial pyoderma.

The effectiveness of the tested treatments was determined by the time disappearance of clinical signs of pyoderma and no recurrence of the disease. The degree of reliability established by Student distribution.

**Results and discussion.** Observations of the dog first experimental group, who were treated by "Nanosept," found flushing decline, the allocation of fluid on the surface of the skin almost stopped, the maintained swelling of the affected surface.

Surrounding skin dermatitis was thick and slightly swollen. The surface of the affected part of the skin was covered with scabs with young epithelium under. In the final stage, 6-8 days after the treatment started, observed the disappearance of nodules and pustules and covering the affected skin with young pink epithelial tissue. Palpation found slightly compacted and not painful skin with started restoring hair.

Observations of the dogs of the second experimental group who were treated drug "Chemi-spray" found that at the initial stage of treatment (third day) was observed skin redness, swelling of the affected surface, there has been a discharge of fluid on its surface. Adjacent skin with the lesions is tight and swollen. The surface of the affected part of the skin was covered with scabs, sealed and pain persisted. The disappearance of the signs of skin edema was observed for 3-5 days, and signs of exudative process in 3-7 days, redness disappear in 7-10 days. At 12-14 days of treatment damaged skin covered with young epithelium, redness and swelling were absent. Start restoring hair. Where abundant exudation in inflammation Chemi spray application resulted in a thick crust and prevented the absorption of drugs was likely to cause prolongation of the treatment period.

Observations of the dogs third experimental group who were treated drug "Sanoderm" found that at the initial stage of treatment (third day) experienced a reduction of signs redness of the affected skin. Last disappear completely for 4-6 days, swelling of the affected surface disappeared on the third day, and the allocation of fluid on the surface of the hearth dermatitis considerably reduced and completely disappear for 3-5 days. Itching disappeared at the 1-2 day. At 8-11 days

of treatment damaged skin covered with young epithelium, redness and swelling were absent. Start in restoring hair.

General indicators of current clinical symptoms of treatment of all experimental groups drugs "Nanosept", "Chemi-spray" and "Sanoderm" presented in Table 1. During the experiment, one dog in the first group, three dogs in the second group, and four dogs in the third group took use systemic antibiotics and immunotherapy. Average recovery time in the first experimental group was  $7,4 \pm 0,8$ , the second group -  $12,3 \pm 1,2$ , and the third group -  $10 \pm 1,5$  days. In the first experimental group recovered 89% of dogs in the second group, 66.7% in the third -55.5% animals.

**1. General indicators of changes in clinical symptoms in the treatment of dogs with pyoderma**

Study group, medication	Clinical symptoms and their display time from the start of treatment, days				
	Duration				Restoration of hair
	itch	congestion	swelling	exudation	
The first group, "Nanosept"	1-2	3	2-3	3	7-10
The second group, "Chemi-spray"	3-5	7-10	3-5	3-7	10-20
The third group, "Sanoderm"	1-2	4-6	2-5	3-5	10-15

Thus, recovery of surface pyoderma dogs in the first experimental group was 22.3% higher and 50% faster than in the second experimental group and 33.5% higher and 33% faster than in the third experimental group.

The difference in the length of time disappearance of skin inflammation in dogs 1st and 2nd groups associated, in our opinion, with computer components of the "Nanosept" that have antiseptic and anti-inflammatory properties. Because nanoparticles of metals in the course of physical and chemical reactions as a powerful stimulant and donor reactions of oxidation-reduction type, helping respiration [2]. Regarding the third dog experimental group, the acceleration of extinction symptoms of inflammation of the skin due to the presence in the composition "Sanoderm" such a powerful anti-inflammatory drugs, like betamethasone dipropionate. It belongs to a group of potent glucocorticoids with predominantly local action.

The test results showed that the dogs are well tolerated "Nanosept" cases of poisoning and side effects were noted detected. Thus, "Nanosept" can enter the arsenal veterinarian as an effective medication for skin bacterial inflammation in dogs.

It must be emphasized that the invention of "Nanosept" as a new therapeutic tool in pyoderma based nanoaquachelates of metals is particularly practical importance based on these circumstances.

The recommendations of the working group of the International Society for Infectious animal diseases [6] emphasized that the appearance methicillin resistant strains requires the use of local resources in the case of local treatment of purulent processes and limit the use of systemic antibiotics. In particular, local treatment in mono (without simultaneous appointment systemic antimicrobial agents) is regarded as desirable and recommended for the treatment of superficial bacterial folliculitis dogs.

It is known that an important element of classical antibiotic therapy is the selection depending on the sensitivity of the pathogen. In practice it is quite difficult to perform, because bacteriological tests take at least 5-7 days. Therefore, treatments of pyoderma start broad-spectrum antibiotics, while obtaining the results of sowing, if necessary, replace it. This is one of the factors that contribute to the emergence of microbial resistance to antibiotics. Therefore, the use of such

local antiseptic as "Nanosept" is an alternative antibiotic choice. After all, if the application of the ointment «Nanosept» at the time of receipt of microbiological studies does not show signs of recovery, antibiotics can be prescribed without risk of resistance prior to the parasite.

## CONCLUSIONS

1. Patients with superficial pyoderma dogs were treated with the "Nanosept" recovered on average by  $7,4 \pm 0,8$  days. Of the 9 patients animals disappearance of clinical symptoms observed in 8, and thus 89% of cases.
2. Patients with superficial pyoderma dogs were treated with the "Chemi-spray" recovered in an average  $12,3 \pm 1,2$  days. Of the 9 patients animals disappearance of clinical symptoms observed in 6, and thus in 66.7% of cases.
3. Patients with superficial pyoderma dogs were treated with the "Sanodermom" recovered an average of  $10 \pm 1,5$  days. Of the 9 patients animals disappearance of clinical symptoms observed in 5, and thus in 55.5% of cases
4. Recovery of superficial pyoderma dogs in the first experimental group, which were treated with the "Nanosept" was 22.3% higher and 50% faster than in the second experimental group were treated with the "Chemi-spray", and 33.5 % higher and 33% faster than in the third experimental group , which were treated with the "Sanoderm."

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## **ЛІКУВАННЯ ХВОРИХ НА ПОВЕРХНЕВУ ПІОДЕРМІЮ СОБАК НАНОАКВАХЕЛАТАМИ МЕТАЛІВ**

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Проведено клінічне дослідження нової антисептичної мазі Наносепт, до складу якої входять наноаквахелати срібла і міді та розчин йоду. Встановлена ефективна антимікробна дія препарату Наносепт при піодермії собак порівняно з традиційними засобами вибору Чемі-спреєм та Санодермом.

**Ключові слова:** *собаки, піодермія, діагностика, наноаквахелати металів, лікування*

## **ЛЕЧЕНИЕ БОЛЬНЫХ ПОВЕРХНОСТНОЙ ПИОДЕРМИЕЙ СОБАК НАНОАКВАХЕЛАТАМИ МЕТАЛЛОВ**

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Проведено клиническое исследование новой антисептической мази «Наносепт», в состав которой входят наноаквахелаты серебра и меди, а также раствор йода. Установлено более эффективное антимикробное действие

препарата Наносепт при лечении собак больных пиодермией по сравнению с традиционными средствами - Чеми-спреем и Санодермом.

**Ключевые слова:** собаки, пиодермия, диагностика, наноаквахелаты металлов, лечение.