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THERAPIES OF PURULENT MASTITIS IN CATS

V.V. Chekrysheva [1], I.A. Rodin [2*]

[1] *North-Caucasus Zonal Scientific Research Veterinary Institute - Branch of the Federal State Budget Scientific Institution, Federal Rostov Agricultural Research Centre, RUSSIA.*

[2] *Department of Anatomy, Veterinary Obstetrics and Surgery, Kuban State Agrarian University, Krasnodar, RUSSIA.*

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ABSTRACT

A comparative analysis of the most common methods of treating mastitis in cats is carried out, and the incidence of mastitis in cats among the entire obstetric and gynecological pathology is studied. Currently, mastitis in cats is an urgent problem, due to the high cost of treatment costs, the possible death of the cat itself, as well as the shortage of litter of nutrients due to the lack of milk in the female. Possible complications after cats are ill with a purulent form of mastitis include a lack of lactation. Thus, the problem of finding rational methods for treating purulent forms of mastitis in cats is relevant not only for veterinarians but also for owners of animals. Mastitis is the most common pathology among cats and makes up 36.5%. In the course of studies, it was revealed that the purulent form of mastitis occurs in 41% of rays among all forms of mastitis in cats. The clinical picture with a purulent form of mastitis is pronounced: the animal is depressed, refuses to eat, body temperature is increased to 40°C, and pulse and respiratory rate are increased. Signs of inflammation in the mammary gland are also pronounced. The mammary gland is enlarged, hot, hyperemic, swollen, soreness pronounced. A secretion of pus is secreted from the nipples with an unpleasant odor of white-yellow color. Also during the operation was investigated for therapeutic efficacy complex schemes s treatment using antibiotic Sinuloks and non-steroidal anti-inflammatory drug Ainil. The therapeutic efficacy of this regimen reaches 100% within 5 days. A comprehensive treatment regimen using m antibacterial drug Kobactan 2.5% and non-steroidal anti-inflammatory drug Meloxivet 2% is therapeutically effective in 100% of cases for 5 days. The animals of the control group used the antibacterial drug Bicillin 3 twice. Such therapy showed very low therapeutic efficacy (40%).

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*Corresponding author (L.A.Rodin) Email: Rodin@kubsau.ru

1. INTRODUCTION

Mastitis is an inflammation of the mammary gland that develops in response to the action of mechanical, chemical, physical, biological and other factors (Goncharov, 2004; Karlikov, 2006; Chekrysheva et al., 2019). This pathology occupies a leading place among obstetric and gynecological diseases in cats (Zhukov, 2018). Mastitis in cats is often the cause of death due to intoxication and sepsis of the body. Mastitis causes a variety of (adverse effects on the mammary gland of mechanical, thermals is the chemical and biological agents, accompanied by penetration into it is different pathogens) (Arkhipov, 2011; Goncharov, 2004; Polish, 2018).

Of great importance in the occurrence of mastitis is a decrease in the overall resistance of the animal organism, as well as breast tissue, which leads to a weakening of the bactericidal activity of milk and the development of microflora in the mammary gland (Oleinik 2006; Safuanova, Suleymanova, 2013). A decrease in the resistance of the body and breast tissue is more often observed with delayed placenta, endometritis, subinvolution of the uterus, diseases of the gastrointestinal tract and other organs (Kuznetsov and Mayorov, 2001).

With untimely treatment, the acute form of mastitis becomes chronic. In this case, the glandular part of the mammary gland is replaced by connective tissue, and even in case of recovery of the animal, the mammary gland tissue is not restored (Baimisheva, 2007).

Currently, there are many different treatment regimens, but the mastitis problem remains relevant. The search for new drug combinations to increase economic and therapeutic efficacy is of great interest not only to practicing veterinarians and breeders but also to pet owners (Starchenkov, 2001; Drozd, 2015).

In this regard, we set a goal to study the therapeutic efficacy of complex treatment regimens for purulent mastitis in cats.

To solve the problem, the following tasks were presented for resolution:

1) To study the incidence of mastitis in cats among obstetric and gynecological pathologies;
2) Determine the spread of purulent forms of mastitis in cats among all forms of mastitis;
3) Analyze the clinical signs of purulent mastitis in animals;
4) To study the therapeutic efficacy of the proposed integrated treatment regimens.

2. STUDY DETAILS

The studies were carried out in state veterinary hospitals of the city of Rostov-on-Don during 2019. The experiment included 30 cats aged 1-8 years with a suspected purulent form of mastitis. All animals were not sterilized.

To make a diagnosis, each animal underwent a general clinical study, as well as a special obstetric-gynecological study. In a clinical study of the animal, a thorough medical history was conducted, which took into account the age, breed, physiological condition of the female (exactly how the pregnancy progressed, the course of the birth, during the birth, the postpartum period, the number of days after delivery, the number of kittens in the litter), the time of the disease, who and how it helped, what drugs were used to treat earlier, the general condition of the animal, appetite. Then, each animal was subjected to a general clinical study, and temperature, pulse rate, and respiratory movements were evaluated.

When examining the mammary gland in cats, attention was paid to its shape, symmetry, color, and integrity of the skin, and the state of the superficial blood and lymph vessels. With superficial

palpation, the local temperature in the symmetrical areas of the mammary gland was compared. With deep, the presence of pain, foci of compaction or softening, the condition of the lymph nodes: size, texture, mobility, soreness. Nipples were examined by rolling between fingers to detect morphological changes in their wall, channel patency. In addition, test distillation was performed from each milk bag to evaluate the resulting exudate. The secreted secretion was investigated by external signs: by color, smell, consistency, and uniformity.

We also used additional laboratory research methods, namely an ultrasound examination of the abdominal cavity of sick animals in order to establish a concomitant pathology, a hematological examination of the blood of cats to determine the intensity of the inflammatory process.

The diagnosis of a sick animal set comprehensively, taking into account the data of the anamnesis, complete cus-ethnic study of the animal, the total analiza blood. In this case, the severity of the course of the disease was taken into account.

After analyzing the results of a clinical obstetric study, we studied the incidence of purulent mastitis in cats among obstetric and gynecological pathologies, as well as the spread of purulent forms among all forms of mastitis in cats.

At the second stage of the studies, the clinical signs of a purulent form of mastitis in cats were determined.

At the next stage of our studies, we divided the studied animals into 3 groups: 2 experimental and 1 control. Each group included 10 sick cats. The cats of the first experimental group used the antibacterial drug of the penicillin group, Sinuloks for injection, because it has a wide spectrum of bactericidal activity at the rate of 8.75 mg/kg of the animal's weight intramuscularly for 5 days. Antibacterial therapy was supplemented with the use of non-steroidal anti-inflammatory drug Ainil 1%. Ketoprofen, which is part of Ainil 1%, is a derivative of propionic acid, has a pronounced anti-inflammatory, analgesic and antipyretic effect, inhibits platelet aggregation. Ainil 1% was administered intramuscularly at the rate of 3 mg per 1 kg of animal body weight for 3 days.

The cats of the second experimental group used a complex antibacterial drug of the cephalosporin series of the 4th generation of systemic action Kobactan 2.5% at the rate of 0.5 ml per 5 kg of animal body weight intramuscularly with an interval of 24 hours for 5 days. Regimen supplemented using non-steroidal anti-inflammatory drug class oxicams (derivative enolovoy acid) Meloksivet 2%, having a pronounced anti-inflammatory and analgesic activity with antipyretic properties in E. Meloxivet 2% was injected subcutaneously twice according to the following scheme: for the first administration at the rate of 0.2 mg per kg of animal body weight, the second administration should be carried out with an interval of 24 hours at the rate of 0.1 mg per kg of cat's body weight.

Cats of the control group were used drug "Bitsillin 3", which relates to antibacterial medication penicillin groups based 20,000 units per kg of animal body weight. The drug was administered 1 time in 3 days twice.

Simultaneously with the therapy, in all three groups weaned kittens from sick animals. Sick animals were monitored daily until recovery. To establish a diagnosis of purulent mastitis, as well as evaluating the results of therapy, blood samples were taken from animals for research. A general blood test was performed on an automatic analyzer. Its parameters are eritrotsity, hemoglobin, hematocrit, mean hemoglobin in erythrocytes, platelets, myelocytes, and leukocytes.

At the final stage of the studies, the therapeutic efficacy of the proposed treatment regimens for cats with purulent mastitis was evaluated. When assessing therapeutic efficacy, not only the percentage of recovery of animals was taken into account, but also the occurrence of relapses or a transition to a chronic course. The onset of recovery was judged by a change in the general condition of the animal and mammary gland, the nature of the secretion of the udder, and hematological parameters.

3. RESULTS

From the data in Table 1 shows that the most common obstetric and gynecological disorders are among cats mastitis (36.5%), the following is the most common pathology of endometriosis (29.5%) also have a large distribution of neoplasm mammary (19,5%) Less commonly recorded pyometra (11%) and mastopathy (3.5%).

Table 1: The incidence of mastitis in cats.

Nosological unit	Number of animals	
	goals	%
Mastitis	73	36.5
Mastopathy	7	3,5
Breast neoplasms	39	19.5
Pyrometer	22	11
Endometritis	59	29.5
TOTAL	200	100

Like wine from Table 2, the body temperature in all cats included in the experiment, in the first day of treatment was significantly higher than normal and reached a 40 ^{0} C, and on the second day - it has dropped to normal. However, in the control group was observed in some cats, and the temperature rise at the 2 and 3 days or treatment. Heart rate before and after treatment was high as a result of stress from transporting animals. The frequency of respiratory movements in the first days of treatment was at a fairly high level and reached 41 respiratory movements per minute. Starting from day 3, the respiratory rate remained within the physiological norm throughout the course of treatment.

After analyzing the clinical picture in cats, patients with a purulent form of mastitis concluded that most often purulent mastitis is quite difficult. The animal is significantly depressed, there is no appetite, the cat lies, does not show activity. Affected milk packets are hot to the touch, enlarged, hyperemic, and soreness is pronounced. During the test removal from the affected milk package, a white-yellow secret with an admixture of pus with a fetid odor is released. The body temperature of the animal reaches 40 ^{0} C, breathing and pulse are quickened.

Table 2: The Dynamics of the physiological parameters of cats with purulent mastitis

Group of animals	Temperature, °C		Pulse beats. / min.		Breath DV ./min.	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
1 experienced	39,8-40,1	37,9-38,3	154-159	124-132	34-37	22-28
2 experienced	39,7-40,1	38,1-38,5	142-154	112-134	37-41	21-29
The control	39,6-39,9	38,7-39,1	145-157	123-136	32-38	25-30

The results of a study of the effectiveness of complex treatment regimens for a purulent form of mastitis in cats are presented in Table 3.

Table 3 shows the data on the therapeutic effectiveness of complex treatment regimens, so in the first and second experimental groups all animals recovered, the duration of the therapeutic course was on average 5 days. In the control group, 40% of the cats recovered. One cat developed an abscess in one of the milk packets, and the rest, the inflammatory process spread to neighboring milk packets.

Table 3: The effectiveness of the complex treatment of cats with a purulent form of mastitis a.

Groups	Treated animals	The number of days of treatment	Recovered	
			animals	%
1 Experienced	10	5 ± 0, 2	10	100
2 Experienced	10	5 ± 0.1	10	100
Control	10	6 ± 0.3	4	40

From the data in Table 4, it can be seen that before the start of treatment, a pronounced inflammatory process took place in cats in the mammary gland, this was expressed in an increased number of leukocytes and a high level of ESR. An increased amount of granulocytes in the blood may indicate purulent inflammation in the body of the animal. A decreased level of lymphocytes indicates the course of a bacterial infection. After the treatment in the experimental groups, all indicators were within acceptable values, namely, the level of leukocytes and ESR decreased, the number of lymphocytes increased, which indicates the phase of recovery. Also, the level of granulocytes decreased to normal values. The levels of hemoglobin, erythrocytes, hematocrit, and platelets before and after treatment were within acceptable values.

Table 4: The Dynamics of hematological parameters in the complex treatment of cats with a purulent form of mastitis a

Indicator	The first experimental group		The second experimental group		Control group	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Hematocrit (HCT) %	35±6.2	42±7.7	31±4.9	40±5.2	38±4.8	34±7.2
Hemoglobin, g / l (Hgb)	162±16.3	1 74±11.7	173±10.6	158±17.3	167±9.7	152±18.4
White blood cells (Wbc) 10^9 /L	24.6±3.8	8.7±2.5	26.3±4.3	7.3±2.7	26.1±3.9	17±4.3
Red blood cells (RBC), 10^{12} /L	9.2±1.8	8.9±2.2	9.7±1.6	9.3±2.4	9.4±1.9	9.3±2.4
Granulocytes (Gra), 10^9 /L	17.43±0.9	6.1±0.85	19.7±1.3	6 .6±0.9	19.34±0.8	5.42±1.2
Lymphocytes (Lym), 10^9 /L	0.9±0.2	3.2±0.3	0.7±0.1	3.8±0.1	0.6±0.2	3.6±0.4
Platelets (Plt), 10^9 /L	201.4±10.3	221.4±8.5	208.7±5.8	211.9±9 .34	209.3±7.5	217.4±7.85
ESR, mm/h	19.3±2.11	3.8±1.15	21±1.9	3.4±1.4	20.6±2 .1	7.8±1.89

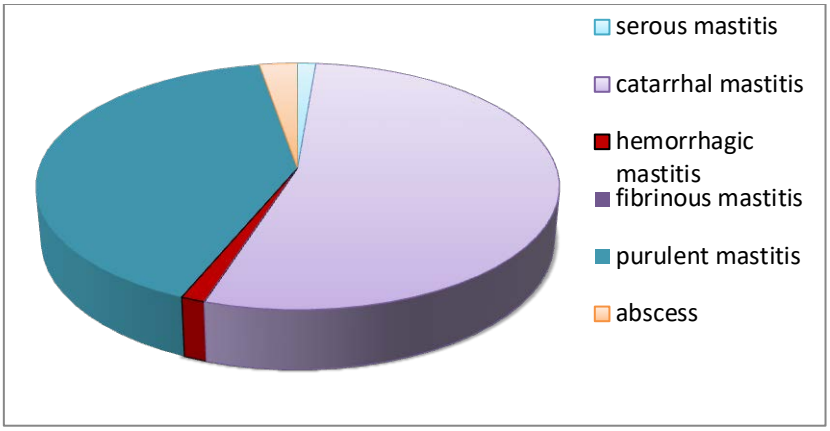

Figure 1: Forms of mastitis

At the next stage of the study, the prevalence of purulent mastitis among all forms of

inflammation of the mammary gland was analyzed. The results of this analysis are shown in Figure 1.

Figure 1 shows that the catarrhal form of mastitis is the most common (53.7%), the purulent form of mastitis (41%) takes the next place. An abscess of the mammary gland in a cat was found only twice, which is 2.7%. Serous and hemorrhagic forms of mastitis in cats had isolated cases, which is 1.3% of cases.

4. DISCUSSION

In this article, a comparative analysis of the most common methods of treating mastitis in cats is carried out, and the incidence of mastitis in cats among the entire obstetric and gynecological pathology is studied. Currently, mastitis in cats is an urgent problem, due to the high cost of treatment costs, the possible death of the cat itself, as well as the shortage of litter of nutrients due to the lack of milk in the female. Possible complications after cats are ill with a purulent form of mastitis include a lack of lactation. In view of this, the problem of finding rational methods for treating purulent forms of mastitis in cats is relevant not only for veterinarians but also for owners of animals. Mastitis is the most common pathology among cats and makes up 36.5%. In the course of studies, it was revealed that the purulent form of mastitis occurs in 41% of rays among all forms of mastitis in cats. The clinical picture with a purulent form of mastitis is pronounced: the animal is depressed, refuses to eat, body temperature is increased to 40°C, pulse and respiratory rate are increased. Signs of inflammation in the mammary gland are also pronounced. The mammary gland is enlarged, hot, hyperemic, swollen, soreness pronounced. A secretion of pus is secreted from the nipples with an unpleasant odor of white-yellow color. Also during the operation was investigated for therapeutic efficacy complex schemes s treatment using antibiotic Sinuloks and non-steroidal anti-inflammatory drug Ainil. The therapeutic efficacy of this regimen reaches 100% within 5 days. A comprehensive treatment regimen using m antibacterial drug Kobactan 2.5% and non-steroidal anti-inflammatory drug Meloxivet 2% is therapeutically effective in 100% of cases for 5 days. The animals of the control group used the antibacterial drug Bicillin 3 twice. Such therapy showed very low therapeutic efficacy (40%).

5. CONCLUSION

Mastitis is the most common obstetric-gynecological pathology among cats and makes up 36.5%. Purulent form of mastitis in cats occurs in 41% of cases among all forms of mastitis. With a purulent form of mastitis in cats, a significant deterioration in general condition, refusal of feed, an increase in body temperature to 40°C, an increase in heart rate and respiratory rate are noted. In the mammary gland, all signs of inflammation are manifested: an increase in size, pain, swelling, hyperemia, a secretion with an unpleasant odor of white-yellow color with an admixture of pus is secreted from the nipples. A comprehensive treatment regimen using the antibacterial drug Sinulox and the non-steroidal anti-inflammatory drug Ainil 1% is therapeutically effective in 100% of cases for 5 days. A comprehensive treatment regimen using m antibacterial drug Kobactan 2.5% and non-steroidal anti-inflammatory drug Meloxivet 2% is therapeutically effective in 100% of cases for 5 days.

6. AVAILABILITY OF DATA AND MATERIAL

Information can be made available by contacting the corresponding author.

7. ACKNOWLEDGMENT

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Victoria Vladimirovna Chekrysheva is with the North-Caucasus Zonal Scientific Research Veterinary Institute - Branch of the Federal State Budget Scientific Institution, Federal Rostov Agricultural Research Centre, RUSSIA. She is a Candidate of Veterinary Sciences. Her practice and research are in the fields of Veterinary Sciences.

Professor Dr.Igor Alekseevich Rodin is Professor at the Department of Anatomy, Veterinary Obstetrics and Surgery, the Kuban State Agrarian University, Russia. He holds a Doctor of Veterinary Sciences from Kuban Agricultural Institute. His practice and research encompass Obstetrics and Gynecology, General and Private Surgery, Ophthalmology, Biotechnology of Reproduction of Small Pets, General and private Surgery.

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