Introduction. Feline calicivirus infection (calicivirosis) is a highly contagious disease of the cat family (Felidae), which clinically causes conjunctivitis, ulcerative stomatitis, rhinitis, tracheobronchitis, pneumonia. It is accompanied by significant mortality [1, 2, 3].

Virological studies of scientists from different countries show that calcivirus infection is panzootic and it is common among both domestic and wild cats all over the world [1, 6, 7].

The analysis of published data allowed us to compile that information. Only Felidae family animals are prone to illness. However, according to some researchers calcivirus, spread in recent years by other mammals, reveals the phylogenetic origin of the virus, which is a consequence of the lability of its genome [1, 5]. If the calicivirus infection is not complicated by secondary microflora, in 60% of cases the clinical recovery of the animal begins in 1-2 weeks. However, calcivirus as monoinfection is rarely recorded. It is usually complicated by cocci disease, mycoplasma, chlamydia, bordatellamy, herpes- and retro viruses. In these cases death of cats occurs within two weeks and may reach 85% [1, 6, 7].

The purpose of the research. A comparative analysis of classic and new treatment methods of feline calicivirus infection.

Material and methods. The experiment was conducted in a private clinic of veterinary medicine "CatDog", Dnipropetrovs’k. We have studied 20 cats (age 9 months – 4 years) suffering from calcivirus at the same stage of the disease (3-5 day illness), which is characterized as the initial stage and 10 clinically healthy animals (control group).

Having determined the diagnosis of feline calicivirus infection, sick animals have been divided into experimental groups: group I (classical regimen) - 12 animals, group II (new regimen) - 8 animals.

Scheme of the first treatment group:

- Treatment is based on the use of serum immunoglobulin "Vitafel", which is used to produce passive immunity. To prevent dehydration of animals we have used intravenous solutionis Ringer - Locke and 5% glucose solution.
- In order to suppress the development and propagation of secondary infection we have used broad-spectrum antibiotics - "Flemoksin Solutab
0.25". Along with antibiotic we have used ascorbic acid and vitamins - "Tetravit" to support the body.

In cases of purulent discharge from eyes and nose, we have pipetted antiviral drops "Anandyn". For the lubrication of mouth ulcers a solution “Lugoli” has been used.

To stimulate non-specific resistance of the organism we have used "Fosprenil" and "Cyclopheron" as immunomodulator (Table 1).

Treatment of animals in the second group (new regimen):

We have used immunomodulator "Cyclopheron". Antiviral drops "Anandyn" have been injected during the purulent discharge from eyes and nose. For the lubrication ulcers in the mouth we have used - Ioddicerin solution. To prevent dehydration we have injected intravenous solutionis Ringer-Locke and to increase body resistance - solution "Dufalayt." In order to suppress the development and propagation of secondary infection we have used broad-spectrum antibiotics - "Ceftriaxone". Metabolic processes have been optimized by vitamins "Gamavit."

Animals of the third group have been clinically healthy (control group). The scheme of the experiment is shown in Table 1.

During the experiments the animals were subjected to daily clinical examination. Assessment of the effectiveness of treatment has been made by absence of clinical signs of disease, appetite, body temperature, gradual reduction of fluid discharge from the nasal cavity and eyes.

Results and discussion. During the clinical examination we have found one of the major clinical manifestations of feline calcivirus infection - sores on the tongue and palate (Fig.1). The pathological-anatomical dissection was performed in the dorsal position using the method of evisceration in a generally accepted sequence (Fig. 2).

The external examination of corpses has shown the following: sunken eyes, conjunctiva was not changed (in two cases), with pale bluish tint (in two cats). Mucous membranes of the nasal cavity in two cases were not changed, and two of them had signs of sero-purulent rhinitis. Retropharyngeal and submandibular lymph nodes have enlarged in size, reddened or gray-pink, juicy on the cut. All animals had edema and

Table 1. Scheme of the experiment

<table>
<thead>
<tr>
<th>Group of animals</th>
<th>Number of animals</th>
<th>Name of medical preparations</th>
<th>Place of injection</th>
<th>Treatment regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>12</td>
<td>Vitafel</td>
<td>subcutaneously</td>
<td>3 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fosprenil</td>
<td>intramuscularly</td>
<td>7 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flemoksin Solutab 0.25</td>
<td>orally</td>
<td>5 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anandyn</td>
<td>On eye conjunctiva</td>
<td>10 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Solution “Lugoli”</td>
<td>For the lubrication of mouth ulcers</td>
<td>10 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Solutionis Ringer-Locke</td>
<td>intravenously</td>
<td>7 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5% Glucose solution</td>
<td>intravenously</td>
<td>7 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tetravit</td>
<td>subcutaneously</td>
<td>28 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vitaminum C</td>
<td>intravenously</td>
<td>5 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cyclopheron 12,5%</td>
<td>intramuscularly</td>
<td>10 days</td>
</tr>
<tr>
<td>Group 2</td>
<td>8</td>
<td>Ceftriaxone</td>
<td>intramuscularly</td>
<td>5 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5% Solutionis Novocaini</td>
<td>Solution for Ceftriaxone</td>
<td>5 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anandyn</td>
<td>On eye conjunctiva</td>
<td>5 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cyclopheron 12,5%</td>
<td>intramuscularly</td>
<td>8 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dufalayt</td>
<td>intravenously</td>
<td>7 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gamavit</td>
<td>subcutaneously</td>
<td>5 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Solutionis Ringer-Locke</td>
<td>intravenously</td>
<td>7 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ioddicerin solution</td>
<td>For the lubrication of mouth ulcers</td>
<td>7 days</td>
</tr>
<tr>
<td>Control group</td>
<td>10</td>
<td>Clinically healthy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
hyperemia of the tonsils. In the mouth cavity on the mucosa of three corpses we have identified ulcers in the roof of the mouth and back areas of the tongue sized 0,5-3,5 cm. Vessels between the rings of the trachea were enlarged and full of blood.

In cats with a distinct vivo clinical manifestation of the disease we have observed evident pathological-anatomical changes in the form of pneumonia or bronchitis, affecting the upper and middle parts of the lungs. In addition to these changes we have found venous congestion and pulmonary edema in all animals (Fig. 3, 4).

Some animals were found with extraneous matrion in translucent reddish liquid in the chest cavity. All lymph nodes of the chest cavity have been enlarged and reddened.

In animals with less distinct clinical features we have observed light pink or red lungs.

The top of the heart was blunted, the right ventricle was expanded, the wall was loose, color of the heart muscle was uneven with grayish colour parts of different size, shape and location. The balance of the wall thickness of the left ventricle to the right was 4: 1.

During the study of the abdominal carvity organs we have observed the anatomically correct position of organs. Spleen was elastic, dark red, not enlarged.

The liver was dark red, spotted with grayish-yellow or pale yellow colour, sometimes it had a small nutmeg figures. Gallbladder was full of viscous dark green bile.

Pancreas was evenly colored (yellow with patches of pink and red), swollen, enlarged in size, the cut surface was wet.

Buds of brownish color with patches of red have been observed. Two cats had cysts (Fig. 5, 6). The cut was wet, boundary between cortical and medullary layers in animals with distinct clinical features of the disease was not clear. The cortical layer was brownish, the brain was pink or cyanotic, with weakly observed granulosis. In the wall of the bladder some animals have been no-
noticed with pinpoint hemorrhage.

All intestinal lymph nodes have been enlarged, swollen, evenly colored (with patches of blue and red), the cut had alternate red and gray-white areas. On the surface lymph nodes often have been found with pinpoint hemorrhages.

Mucous membrane of duodenal, jejunum and ileal gut along the whole length in all animals with distinct clinical features of the disease were hyperemic, covered with thick dull yellowish viscous mucus. In animals with mild clinical signs of disease the mucous membrane was dull, swollen, in the jejunum it was covered with thick, muddy, yellow-gray mucus that was not washed off with water.

At the onset of the disease 4 cats have died in the first group, and in the second group all cats have recovered during the whole treatment period.

Thus the latest regimen has proved to be the most effective, thanks to "Cyclopheron", which is an immunomodulator and has a wide range of antiviral activity. Moreover, it creates a regenerating effect on the affected tissue and mucous membranes, normalizing metabolism in tissues. Due to its biological properties ‘Dyufalayt’ restores the function of enzymes, amino acids, which are accessible material for protein synthesis, erythropoiesis and transport of hormones; dextrose needed for body energy and electrolytes to replace lost body salts.

Furthermore, ‘Ceftriaxone’ played a positive role. It is a third generation cephalosporin antibiotic, which has a broader spectrum of antimicrobial activity than ‘Flemoksyn’ (amoxicillin group).

‘Gamavit’ contains a set of biologically active substances, which increase the effect of drugs, serum bactericidal activity and appetite. ‘Gamavit’ renders immunomodulatory and overall biosynthesis effects and neutralizes the toxins.

To prevent dehydration in animals we have used Ringer-Locke solution that regulates fluid—and—electrolyte and acid-base balances in the organism of animals.
Taken together, these drugs provide a quick positive results in the treatment of feline Calicivirus infections. From the first day of treatment body temperature started to decrease; on the sixth day breathing movements and heart rate were within the physiological norm, while during the classical scheme treatment body temperature, heart rate and breathing movements varied and reached the limits of physiological norm on the eighth day of treatment.

Calculation of cost-effectiveness of veterinary measures:

Payment calculation of veterinary services in treatment of feline Calicivirus infections:

\[ \text{1 per/ min.} = \frac{\text{Veterinary salary for the year: 21 workdays: 7 h.: 60 min.}}{21: 7: 60} = 0.26 \text{ UAH.} \]

The cost of 1 per / min. of work

To conduct medical research activities in the first group we have spent 30 minutes, while in the second group - 18 min. In addition, 100 UAH is the average cost of commercial manipulation.

Experimental group 1= 30 min. x 0.26 USD. x 12 animals = 93.6 UAH + 1200 UAH = 1293.6 UAH.

Experimental group 2 = 18 min. x 0.26 USD. x 8 animals = 37.44 UAH + 800 UAH = 837.44 UAH.

Thus, payment of veterinary services in the treatment of cats in 2 experimental groups is under 1293.6 and 837.44 UAH.

The total amount of the cost for manipulation in the treatment of feline Calicivirus infections, which includes the cost for drugs and labor expenses of Veterinary Services is:

First experimental group: 1293.60 UAH. + 397,05h x 12 heads= 6063.60 UAH.

Second experimental group = 837.44 UAH. +237,85h x 8 heads = 2740.24 UAH.

Therefore, from the above calculation we have determined that a classical method needs most of the costs for veterinary treatment of feline Calicivirus infections - 6063.6 UAH., and the latest experimental group treatment requires significantly lower costs - 2740.24 UAH.

Treatment of one animal using the classical scheme is 397,05 UAH., while using the latest scheme is equal to 237.85 UAH.

**Conclusions.**

1. During the clinical examination we have found one of the major clinical manifestations of feline Calicivirus infection - sores on the tongue and palate. In animals with a distinct clinical manifestation of the disease we have observed florid pathological-anatomical changes as pneumonia or bronchitis, affecting the upper and middle parts of the lungs. In addition to these changes all animals have been diagnosed with venous congestion and pulmonary edema.

2. The new regimen has proved to be more effective because of the use of immunomodulator Cyclopheron and third generation cephalosporin antibiotic Ceftriaxone.

3. Most of the costs for veterinary treatment of feline Calicivirus infections needs a classic method - 6063.6 UAH., and the latest experimental group treatment requires significantly lower costs - 2740.24 UAH. One animal treatment using the classical scheme is 397,05 UAH., while the new scheme equals 237.85 UAH.

<table>
<thead>
<tr>
<th>Group of animals</th>
<th>Number of animals</th>
<th>Sick</th>
<th>Surviving</th>
<th>Dead</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>head</td>
<td>%</td>
<td>head</td>
</tr>
<tr>
<td>I</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I</td>
<td>12</td>
<td>12</td>
<td>100%</td>
<td>8</td>
</tr>
<tr>
<td>II</td>
<td>8</td>
<td>8</td>
<td>100%</td>
<td>8</td>
</tr>
<tr>
<td>III</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Clinically healthy

ПОРІВНЯЛЬНИЙ АНАЛІЗ ЕФЕКТИВНОСТІ КLASИЧНИХ TA НОВІТНІХ МЕТОДІВ ЛІКУВАННЯ КАЛІЦІВІРУСНОЮ ІНФЕКЦІЇ КОТІВ

Зажарський В.В., Ткаченко М.В.

У роботі наведені результати досліджень клінічного огляду, патологоанатомічних змін у ко-тів, хворих каліцівірусною інфекцією. Проведений порівняльний аналіз терапевтичної та еконо-мічної ефективності при застосуванні класичних та нових методів лікування хворих тварин. При клінічному огляді виявлено один з найважливіших клінічних проявів каліцівірусної інфекції котів – виразки на язіці та піднебінні. Встановлено венозний застій і набряк легенів з ураженням верхніх та середніх часток. Новітня схема лікування виявилася ефективнішою, завдяки використанню імуномодулятора Циклоферон та антибіотика третього покоління групи цефалоспо-ринів – Цефтриаксон. Курс лікування однієї тварини складає 237,85 грн.

Коти, хворі каліцівірусною інфекцією, клінічні і патологоанатомічні зміни, терапевтич-ний і економічний ефект