

R.V. Peredera, I.V. Lavrinenko, O.O. Peredera, I.A. Zhernosik
Poltava State Agrarian Academy, Poltava

DIAGNOSIS AND ACTIONS FOR LIQUIDATION OF DOGS STREPTOCOCCOSIS IN PRIVATE NURSERY

E-mail: lenavet26@ukr.net

The article presents epizootic data, clinical signs, pathoanatomical changes and results of laboratory tests for acute and extraordinary manifestation of dogs' streptococcosis. Diagnosis of streptococcosis was established based on an analysis of epizootological data, clinical signs of the disease, pathological and anatomical changes, and confirmed by data from bacteriological studies. To most of the antibacterial agents studied, the isolated pathogen of streptococcus was not sensitive. The causative agent showed high sensitivity to enrofloxacin, where the growth retardation zone was 22-25 mm and tylosin (the growth retardation zone was 20-24 mm). When choosing antibacterial substances, the sensitivity to them of the pathogen of streptococcus was taken into account. "Tilozin-20" drug was applied. The drug was injected intramuscularly once a day for a dog's daily dose of 0.5 ml per 10 kg body weight. To disinfect the premises where the puppies were kept, the "Brovades plus" disinfectant was used. The 1.0% Brudavez-Plus solution (100 ml per 10 liters of water) was used. The disinfection of the premises was carried out daily during the elimination of the outbreak.

Key words: puppy, streptococcosis, clinical signs, pathologic-anatomical changes, treatment, "Tyrolzin-20", disinfection, "Brovades-plus".

The present study is an independent research pilot project.

Streptococcosis (Streptococcosis, streptococcal septicemia, streptoderma) is a bacterial disease mainly of young dogs characterized by acute septicemia, and in the case of subacute and chronic – damaged lung, skin, joints and intestine. In adult animals, the disease is manifested by abortions, postpartum mastitis and endometritis [1, 4].

Streptococcus is susceptible to all types of animals. Often, the disease is registered in young animals aged 15-70 days. Often the source of pathogen is a patient with the streptococcus bitch, which feeds the puppies, with mastitis and endometritis of streptococcal etiology [4, 5].

In adult dogs, streptococcosis appears sporadically. Especially dangerous disease for young dogs in nurseries and dormitories, where the form of epizootics takes on. Epizootic strains of streptococci are often characterized by high pathogenicity and low sensitivity to antibacterial substances [1, 6].

Favorable factors in the development of the disease are the reduction of overall resistance, mucous membranes, stressful situations, unsatisfactory veterinary and sanitary condition of the premises where animals are kept, mixed infections. An important role is playing the number of susceptible animals and the presence of carriers of pathogenic strains [2, 3].

The purpose of the study was to establish a diagnosis for an infectious disease of dogs. Develop effective means of controlling the streptococcus in dogs in a private nursery in Poltava.

Material and methods. The work was carried out in 2017 at a private kennel of Poltava. Firstly, the following items were studied: the veterinary-sanitary and epizootic state of the economy; conditions of keeping and feeding animals, seasonality of occurrence of epizootics, general tendencies of its development. Particular attention was paid to the study of clinical signs and pathological and anatomical changes in spontaneous streptococcus pupa. Diagnosis was carried out in a complex manner. The clinical signs of the disease and the results of microscopic and bacteriological studies were taken into account. Clinical trials were performed using commonly used methods, including a detailed history. Pathoanatomical section of corpses was performed by evisceration method. The attention was paid to the position of organs, their shape and size, color, consistency and drawing.

To study the morphology of microorganisms, smears, from isolated cultures, were dyed with alcohol-aqueous solution of methylene blue. Investigated the sensitivity of the isolated microflora to individual antibacterial drugs with the use of disks.

Results of the study and their discussion. The disease was registered in the private nursery of Poltava during the period of mass puppies birth of different breeds in early March 2017, was characterized by high contagiousness.

The disease was registered in puppies up to two months old. Extraordinary course was observed in puppies of one-, two-week-old age.

The number of sick puppies increased daily. Puppies of French Bulldogs, Yorkshire Terriers and Pomeranians were characterized by sudden weakness, oppression, and a rise in temperature to 40-41 ° C.

In some animals, serous-catarrrhal conjunctivitis and rhinitis developed. In a clinical examination, there was shortness of breath, wheezing, arrhythmic pulse, cyanosis of visible mucous membranes with hemorrhages. In all patients, pupils developed a clinical picture of septicemia, the animals died on the background of increasing weakness for 1-2 days.

Puppies of one month old and older recorded an acute course that lasted about a week. It is characterized by similar clinical signs, which have developed not so dynamically. High body temperature (40-41° C) was recorded during the entire period of the disease. Puppies were oppressed, sluggish, refused to feed. Sick dogs died in 4-5 days with increasing weakness and depression.

The diagnosis of streptococcosis was established in a complex manner based on an analysis of epizootic data, clinical signs of the disease, pathological and anatomical changes, and the results of bacteriological studies.

The dead puppies were not exhausted. Mucous membranes are anemic. The pathoanatomical changes in puppies of various breeds recorded at the autopsy of animal corps were similar. At the autopsy revealed lung edema, signs of acute pneumonia and acute hepatitis (fig. 1).

All the dead animals showed changes that are characteristic of acute nephritis: the kidneys are enlarged, parenchyma focal-hyperemic. The border of the cortical and brain area is not clear, in the cortical zone there are numerous hemorrhages.



Fig.1 Signs characteristic for pulmonary edema (Fig.1.A), acute nephritis (Fig.1.V), acute hepatitis (Fig.1.C) in a puppy of the French bulldog for the extremely extraordinary course of streptococcus.

All puppies, regardless of breed, showed signs of hemorrhagic diathesis and acute splenitis.

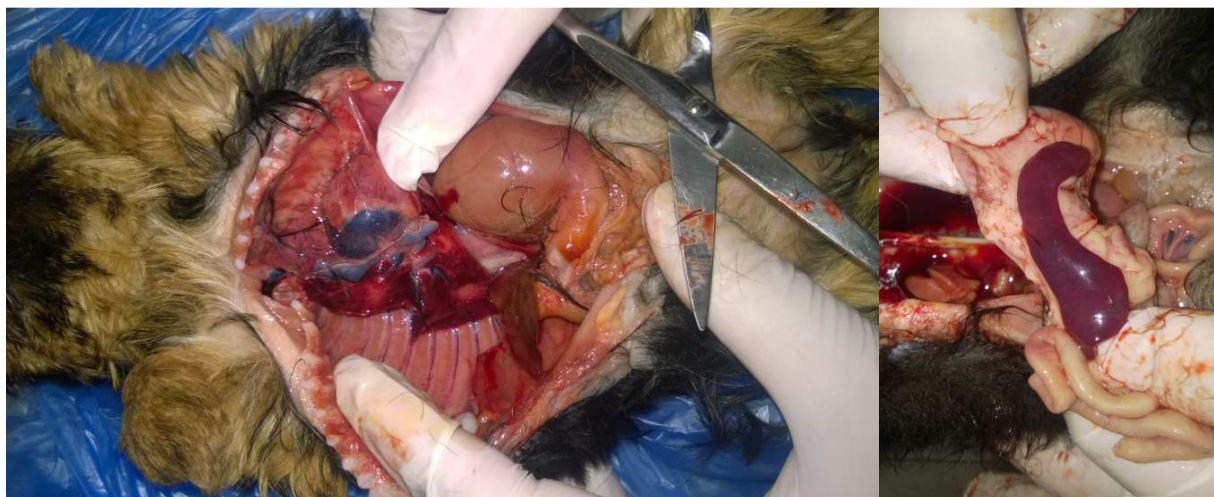


Fig. 2. Signs of hemorrhagic diathesis and acute splenitis in puppies of the Yorkshire terrier for pulmonary forms of acute streptococcus.

For bacteriological examination, pieces of internal organs (heart, liver, spleen, kidney) were selected and cultures were performed on meat-peptone agar(MPA).

After 24 hours, the small, rounded, white colonies of streptococci (Fig. 3 A) grew on the nutrient medium. The smears was made from the colonies, which were dyed with a gentian violet. In smears, pathogens of streptococcal disease were detected.

After receiving a pure culture, the sensitivity of the pathogens of streptococcus was determined to a number of antibacterial substances.

Disc diffusion method was used, which included several steps: preparation of the nutrient medium, preparation of the suspension of microorganisms and their inoculation, overlaying of disks and incubation, recording of the results.

Petri dishes 10 cm in diameter were placed on a horizontal surface and poured 30 ml of molten meat-peptone agar. To freeze the agar, it was left at room temperature. Suspension of microorganisms was prepared from 18 hours agar culture of the causative agent. To the surface of the agar, add 1-2 ml of suspension. The applied culture was evenly distributed on the surface of the agar. 15 minutes after the introduction of a suspension of microorganisms on the surface of the nutrient medium using sterile tweezers, disks with antibiotics (4-5 per petri dish) were applied. The discs were carefully pressed with tweezers to the surface of the agar. After that, the cups were placed in the thermostat upside down. The incubation was carried out for 18 hours at 37°C. At the end of the incubation, the Petri dishes were examined and measured in millimeters by the zone of growth retardation of microorganisms.

The results of assessing the sensitivity of the isolated microflora to individual antibiotics are given in table 1.

Table 1

Sensitivity of streptococci to individual antibacterial agents

Name of the drug	Microflora growth retardation zone, mm	Categories of sensitivity
Amoxicillin	0-2	Resistant
Doxycycline	0-2	Resistant
Polymyxin	-	Resistant
Tylosin	20-24	Sensitive
Enrofloxacin	25-28	Sensitive
Tetracycline	-	Resistant
Neomycin	0-2	Resistant
Cephazolin	-	Resistant
Levomitsetin	-	Resistant
Kanamycin	-	Resistant

As can be seen from the data in the table, the isolated pathogen of streptococcus was not sensitive to most of the antibacterials studied. Amoxicillin, doxycycline, polymyxin, tetracycline, cefazolin and neomycin were isolated microflora resistant, the drugs did not affect the growth of these microorganisms. The zone of growth of the microflora ranged from 0 to 2 mm.

The highest sensitivity of the pathogen is established for enrofloxacin and tylosin (fig. 3B).

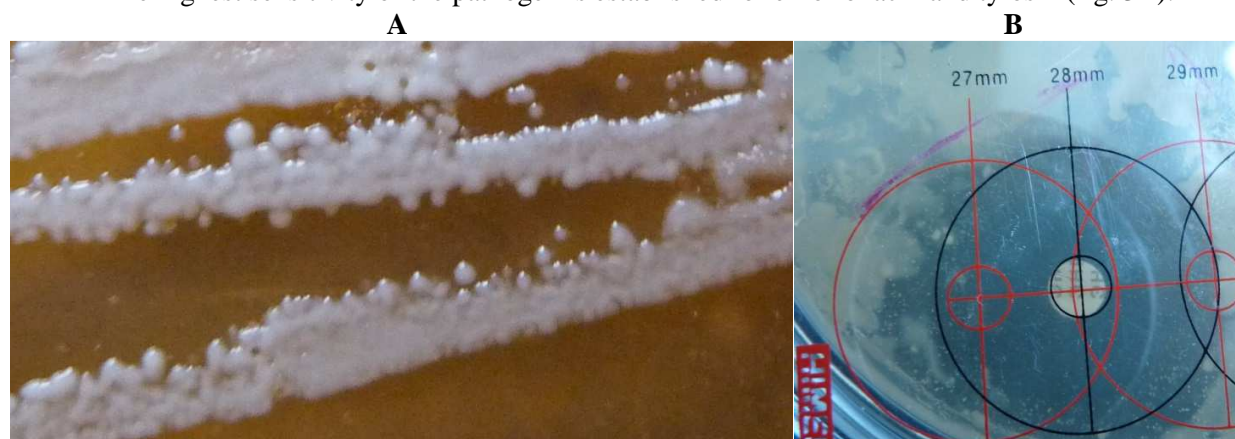


Fig. 3. A. Growth of pure culture of streptococci. B. Investigation of the sensitivity of the current pathogen to enrofloxacin.

The diseased animals were isolated in separate clean, warm rooms and carried out a complex treatment.

When choosing antibacterial substances, the sensitivity to them of the pathogen of streptococcus was taken into account. The highest sensitivity was established for enrofloxacin. However, according to the instructions for use of puppies, the enrofloxacin has not been recommended. Therefore, it was decided to use tylosin-20. Tyrolin belongs to the antibiotics of the macrolide group. The action of tylosin is to inhibit the synthesis of proteins. The tylosin is active against gram-positive (*Staphylococcus* spp., *Streptococcus* spp., *Bacillus anthracis*, *Corynebacterium* spp., *Clostridium* spp., *Listeria*, *Erysipelothrix*

spp.) and some strains of gram-negative microorganisms, including *Haemophilus* spp., *Pasturella* spp. and *Brucella* spp. Also tylozin inhibits the action of some strains of *Actinomyces*, *Mycoplasma*, *Chlamydia*, *Ureplasma* and *Rickettsia*. The drug is indicated in bronchopneumonia, pneumonia, arthritis, mastitis, postoperative and postpartum infections, secondary bacterial infections in viral diseases, respiratory and digestive diseases caused by tylozin-sensitive microorganisms. The drug was injected intramuscularly once a day for a dog's daily dose of 0.5 ml per 10 kg body weight.

Improvement of the clinical status of diseased puppies was noted for the third day after the start of treatment. Puppies grew up, they had an appetite.

To disinfect the disinfectant "Brovades plus", manufactured by "Brovafarma" was used. This disinfectant contains dimetildialkylammonium chloride - 10%; Didetsidimetilammonium chloride - 5%; Ethylenediamine-tetra-acetic acid (EDTA) - 7%, as well as auxiliary components for emulsification, foaming, stabilization, coloring and demineralized water.

The preparation is characterized by bactericidal and sporocidal effects on gram-positive and gram-negative bacteria (*Brucella* spp., *Clostridium* spp., *Klebsiella* spp., *Listeria* spp., *Proteus* spp., *Pseudomonas* spp., *Salmonella* spp., *Staphylococcus* spp., *Streptococcus* spp., *C. jejuni*, *C. fetus*, *E. coli*, *Lactobacillus* arten, *Mycobacterium tuberculosis*, *Y. enterocolitica*, etc.); has a viricidal effect on RNA-containing viruses (*Aviarnavirus*, *Paramixovirus*, *Orthomixovirus*) and DNA-containing viruses (*Parvovirus*, *Dependovirus*, *Aviadenovirus*, *Avipoxvirus*, *Circovirus*).

A 1.0% Brudavez-Plus solution (100 ml per 10 liters of water) was used. The disinfection of the premises was carried out daily during the elimination of the outbreak. In the future prophylactic disinfection was recommended with the use of 0.5% solution Brovades plus once a week, and during the period of mass puppies - daily.

For the purpose of specific prevention of streptococcus, it was recommended to use the inactivated vaccine "Streptovevak". Adult dogs are vaccinated 20-30 days before pairing. Females - after weaning in doses: weighing up to 5 kg - 0,3 and 0,5 cm³, over 5 kg - 0,5 and 1,0 cm³, over 35 kg - 1,0 and 1,5 cm³.

Immunity is formed on the 12-14th day after the first vaccination and lasts up to six months.

According to modern literary data, streptococcosis of dogs is a widespread infectious disease that often occurs in association with other diseases [1, 3]. High susceptibility to the disease is observed in purebred dogs. These data are consistent with the results of our research. In this kennel streptococcosis was found in puppies of the French bulldogs, the Yorkshire Terriers and the Orange Spitz. As noted by Lamm, C. G., Ferguson, A. C., et al. (2010), streptococcosis of dogs is characterized by a variety of clinical forms. According to the results of our studies, the disease was acute and superacute, with signs of septicemia. Changes typical for sepsis were also revealed at the pathological anatomical section: pulmonary edema, signs of acute pneumonia and acute hepatitis.

Tarasov O.V., Sapeko V.V., Gudz V.V., Babkin M.V. (2015) emphasize the complexity of treating streptococcosis in dogs, which is associated with high resistance of the pathogen [6]. Therefore, a prerequisite for the treatment of this disease is the preliminary determination of the susceptibility of the pathogen to antibacterial substances [7]. According to the results of laboratory studies, the pathogen selected by us was sensitive to tylozin. This antibacterial agent was intended for treatment.

In addition to treatment, a set of measures to control streptococcosis should include disinfection and specific prophylaxis. As a disinfectant was used "Brovades plus", which by its characteristic is highly effective and environmentally safe.

For the purpose of specific prevention of streptococcus, it was recommended to use an inactivated vaccine "Streptovevak". According to Matveev A.V. (2008), modern streptococcus vaccine can be used not only for prophylactic but also for therapeutic purposes [5].

The measures we have taken to eliminate the streptococcosis of dogs have been effective due to rapid diagnosis and implementation of a complex of liquidation measures. In farms where treatment is carried out without taking into account the sensitivity of the pathogen to antibacterial agents, the control measures are not effective. In such farms, the subacute and chronic course, latent forms of streptococcosis, which require long-term treatment predominate [1].

Conclusions

1. Sub-acute flow of streptococcus in puppies corresponded to the septic form, most puppies was characterized by sudden weakness, increasing temperature to 40-41°C and rapid death.

2. At the autopsy of the corpses of dead puppies, was discovered the phenomena of hemorrhagic diathesis; changes that are characteristic of acute splenitis, acute hepatitis and pulmonary edema. As a result

of bacteriological research, a pure culture of streptococci was isolated, which was investigated for sensitivity to various antibacterial substances.

3. Taking into account the sensitivity of the selected culture for the treatment of patients, the puppies used "Tyrolin-20". The drug was injected intramuscularly once a day for a dog's daily dose of 0.5 ml per 10 kg body weight.

4. Disinfection of the premises was carried out daily during the elimination of the outbreak. A 1.0% Brudavez-Plus solution (100 ml per 10 liters of water) was used.

References

1. Galatiuk O.E. Preere OO, Lavrinenko IV, Zhernosik IA Infektsiyni khvoroby sobak. Zhytomyr: Ruta; 2018. 276 s. [in Ukrainian]
2. Karasev N. F., Abramov S. S., Yatusevich A. I. Razvedeniye i bolezni sobak. Minsk: Urzhay; 2001. 304 s. [in Russian]
3. Kudryashova AA, Kuzmin VA, Kudryashov AA. Infektsionnye zabolovaniya zhyvotnykh, Moscow: Lan; 2007. 608 s. [in Russian]
4. Remy J, Tennan B. Infectious diseases of dogs and cats. Practical Guide. Moscow: Aquarium-Print; 2005. 290 p.
5. Niamand H. G., Sueter P. F Diseases of Dogs, Moscow 1998. -816 p.
6. Paterson S. Dog skin diseases. Moscow: Aquarium LTD; 2003. 176 p.

Реферат

ДІАГНОСТИКА ТА ЗАХОДИ ЛІКВІДАЦІЇ СТРЕПТОКОКОЗУ СОБАК В ПРИВАТНОМУ РОЗПЛІДНИКУ

Передера Р.В., Лаврінченко І.В., Передера О.О., Жерносик І.А.

У статті наведено епізоотологічні дані, клінічні ознаки, патологоанатомічні зміни та результати лабораторних досліджень за гострого та надгострого прояву стрептококозу собак. Діагноз на стрептококоз встановлювали на підставі аналізу епізоотологічних даних, клінічних ознак хвороби, патолого-анатомічних змін і підтверджували даними бактеріологічних досліджень. При розтині трупів загинилих цуценят виявляли явища геморагічного діатезу; зміни, характерні для гострого спленіту, гострого гепатиту та набряку легень. У результаті бактеріологічного дослідження була виділена чиста культура стрептококів, яку досліджували на чутливість до різних антибактерійних речовин. До більшості досліджуваних антибактерійних засобів виділений збудник стрептококозу був не чутливий. Високу чутливість збудник продемонстрував до енрофлоксацину, де зона затримки росту становила 25-28 мм та тилозину (зона затримки росту становила 20-24 мм). При виборі антибактеріальних речовин враховували чутливість до них збудника стрептококозу. Застосовували «Тилозин-20». Препарат вводили внутрішньом'язово один раз на добу за добової норми для собак 0,5 мл на 10 кг маси тіла. Для дезінфекції приміщень, де утримувалися цуценята, застосовували дезінфектант «Бровадез плюс». Використовували 1,0% розчин «Бровадезу плюс» (100 мл на 10 л води). Дезінфекцію приміщення проводили щоденно впродовж ліквідації спалаху.

Ключові слова: цуценята, стрептококоз, клінічні ознаки, патолого-анатомічні зміни, лікування, «Тилозин-20», дезінфекція, «Бровадез-плюс».

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ДИАГНОСТИКА И МЕРЫ ЛИКВИДАЦИИ СТРЕПТОКОКОЗА СОБАК В ЧАСТНОМ ПИТОМНИКЕ

Передера Р.В., Лавринченко И.В., Передера Е.А., Жерносек И.А.

В статье приведены эпизоотологические данные, клинические признаки, патологоанатомические изменения и результаты лабораторных исследований при остром и сверхостром проявления стрептококкоза собак. Заболевания регистрировали у щенков до двухмесячного возраста. У больных животных отмечался внезапное торможение и скорую гибель. Количество больных щенков ежедневно увеличивалось. Сверхострое течение стрептококкоза у щенков характеризовалось септической формой. У большинства щенков проявлялось внезапной слабостью, повышением температуры до 40-41°C; у некоторых животных регистрировали серозно-катаральный конъюнктивит и ринит. Диагноз на стрептококкоз устанавливали на основании анализа эпизоотологических данных, клинических признаков болезни, патологоанатомических изменений и подтверждали результатами бактериологических исследований. При вскрытии трупов погибших щенков выявляли явления геморрагического диатеза; изменения, характерные для острого спленита, острого гепатита и отека легких. В результате бактериологического исследования была выделена чистая культура стрептококков, которую исследовали на чувствительность к различным антибактериальным веществам. К большинству исследуемых антибактериальных средств выделенный микроорганизм был не чувствителен. Высокую чувствительность возбудитель продемонстрировал к энрофлоксацину, где зона задержки роста составляла 25-28 мм и тилозина (зона задержки роста составляла 20-24 мм). При выборе антибактериальных веществ учитывали чувствительность к ним возбудителя стрептококкоза. Применяли «Тилозин-20». Препарат вводили внутримышечно один раз в сутки при суточной норме для собак 0,5 мл на 10 кг массы тела. Для дезинфекции применяли дезинфектант «Бровадез плюс». Использовали 1,0% раствор «Бровадез-плюс» (100 мл на 10 л воды). Дезинфекцию помещения проводили ежедневно в течение ликвидации вспышки.

Ключевые слова: щенки, стрептококкоз, клинические признаки, патолого-анатомические изменения, лечение, «Тилозин-20», дезинфекция, «Бровадез-плюс».

Рецензент Пилипенко С.В.