

SIALIC ACIDS CONCENTRATION DYNAMIC ON BIOLOGICAL PHARMACOTHERAPY OF DOGS, SICK WITH CATARRHAL BRONCHOPNEUMONIA

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Abstract

Bronchopneumonia is common in dogs, because the mucous membrane of the respiratory tract is easily exposed to pathogenic microflora, which cause inflammation. In this case, there is a metabolic disorder, which certainly affects the livelihoods of the animal. One of the main indicators of metabolic disorders is the level of sialic acids. There are a lot of methods and preparations for treatment of dogs, sick with catarrhal bronchopneumonia. But they are not always effective. Moreover, most of these methods have a lot of side effects and contraindications. That is why the purpose of our work was to study the efficiency of complex antihomotoxic pharmacotherapy with complex antihomotoxic preparations traumeel and phosphor-homaccord in the treatment of dogs, sick with catarrhal bronchopneumonia and to evaluate their efficiency in the correction of metabolism, in particular, the level of sialic acids.

Keywords: Sialic acids, catarrhal bronchopneumonia, antihomotoxic therapy

INTRODUCTION

Bronchopneumonia is common in dogs, because the mucous membrane of the respiratory tract is easily exposed to pathogenic microflora, which cause inflammation. In this case, there is a metabolic disorder, which certainly affects the livelihoods of the animal [5,7]. One of the main indicators of metabolic disorders is the level of sialic acid. Sialic acids - the acialic derivatives of neuraminic acid, are present in all tissues and body fluids of animals and humans and in some microorganisms. In dogs, the highest amount of sialic acids is found in the salivary glands, in the secrets of various mucous membranes and in the blood serum, where their content sharply increases in a number of diseases. Sialic acids are polyfunctional compounds with strong acid properties. As a rule, they are not found in the free form, they are included in the composition of various carbohydrate-containing substances, such as glycoproteins, glycolipids (gangliosides), oligosaccharides. Taking the last position in the molecules of these substances, sialic acids have a significant effect

on their physicochemical properties and biological activity. Determining the negative charge of glycoprotein molecules, sialic acids cause the elongated shape of their molecules and, as a consequence, the high viscosity of these glycoproteins containing the secrets of the mucous membranes of the respiratory, intestinal and genital tracts. This provides protection of mucous membranes from mechanical and chemical damages. The presence of sialic acids in the blood proteins (ceruloplasmin, acid alpha1-glycoprotein, etc.) and some hormones (chorionic gonadotropin, follicle-stimulating and luteinizing hormones) determines the duration of circulation of these compounds in the bloodstream. After the elimination of sialic acids, when galactose becomes the terminal sugar in the glycoprotein molecules, these proteins are absorbed by the liver cells. This explains the loss of hormones biological activity. The duration of circulation in the bloodstream of certain blood cells (erythrocytes, lymphocytes) also depends on the presence or absence of sialic acids on their surface. The aging process of erythrocytes is associated with a decrease in the amount of sialic acids. Being in the carbohydrate part of glycoproteins, sialic acids mask the remains of sugars, which are antigenic determinants and

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thus play an important role in immune reactions, reducing the immunogenic properties of normal and tumor cells. It was found that sialic acids are a component of cellular receptors [4].

For the correction of immunity in dogs with catarrhal bronchopneumonia, today there are a lot of methods and preparations. But these methods are not always effective. Moreover, most of these methods have a lot of side effects and contraindications. That is why the purpose of our work was to study the efficiency of complex antihomotoxic pharmacotherapy with complex antihomotoxic preparations traumeel and phosphorhomaccord in the treatment of dogs, sick with catarrhal bronchopneumonia and to evaluate their efficiency in the correction of metabolism, in particular, the level of sialic acids. [1-2].

One of the methods of treatment and immunocorrection is homeopathy and variety of it - complex antihomotoxic therapy. Homeopathy, as an addition to traditional therapy, aims to use biotechnological methods for the treatment of animals.

The animal's organism is struck by the complexity of the structure and the perfection of functions. Interest in its design and laws of functioning developed in parallel with reasonable human activity and had not only positive significance. The historical time scale does not diminish the amazing importance of the way in which the evolution of our ideas about the phenomena of health and pathology has evolved - from the Hippocratic crasis, cruditas, coctio and crisis to the discovery of the molecular mechanisms of diseases in our day. One of the main tendencies of this evolution attracts attention - the natural shift of accents to a deeper level of organization of living matter - from the body, then to tissues, cells, subcellular structures and, finally, to molecules. Moreover, the growing volume of scientific information has caused the allocation of new and new scientific disciplines, the formation of scientific subsections, the formation of new departments in accordance with the real requirements of practical veterinary medicine [4].

It is established that all substances and information entering the cell pass through the molecular sieve filter, the extracellular space

(matrix). Any sieve can be "clogged", but with the help of appropriate drainage measures its functions can be restored. In addition, immunocompetent cells are patrolled in the main substance, which perform distinctive and detoxifying functions. The picture of the basic regulation is supplemented by the circumstance that the main substance is attached to the nervous and hormonal systems. This confirms the antihomotoxic theory of H.H. Rekiweg.

H.H. Rekiweg considers the interaction of regulatory mechanisms in connection with the body's basic substance, and his system of views formed the basis for the theory of antihomotoxic therapy. The principles of this therapy are: elimination of toxins and immunomodulation and activation of organ functions. The implementation of these principles is carried out with the help of stimulating affects on the mechanisms of regulation, and this influence is conceptual for modern medicine. Antihomotoxic therapy, based on the principles of impact on the body, refers to regulative therapy.

The purpose of antihomotoxic therapy is detoxication of organ systems (elimination of homotoxicosis), regeneration of effected organs, elimination of disorders and activation of self-regulation, self-healing and self-recovery (restoration of homeostasis).

In the practice of antihomotoxic restoration of animal health, the foundation is justified from the standpoint of physiology and biochemistry, the concept of the use of complex antihomotoxic preparations. This group of pharmacological agents manifests in the organism a complex multi-vector effect on various morphological substrates, from cellular enzymes to structures that provide intersystem interaction. The last thing, of course, applies not only to a single immune-neuro-endocrine system, with its known corrective effect on homeostasis and reactive functions, but also to the intercellular matrix system. This provides homeostatic control and integrates into the only whole an open energy system of the organism. As the scientific research shows, the main pharmacological effect of complex antihomotoxic preparations is the result of regulation of autonomic function, detoxification processes in the body, increasing the immune and hormonal status.

The pharmacological action of antihomotoxic preparations is manifested in the activity of cellular enzymes and coenzymes in individual organ and tissue structures. This allows their use according to the relevant indicators for various pathological conditions. The generally recognized advantages of antihomotoxic drugs are the following: the absence of allergic reactions in the body, the danger of overdose, the convenient mode of administration, the long positive aftereffect. All this makes it possible to classify antihomotoxic drugs as essential achievements of veterinary medicine in solving multifaceted problems of preserving animal health [3, 4, 8].

The purpose of our studies was to study the effectiveness of the use of complex antihomotoxic pharmacotherapy with the use of antihomotoxic preparations traumeel and phosphor-homaccord in the treatment of dogs, sick with catarrhal bronchopneumonia and to assess their effectiveness in the correction of immunity, in particular, the level of sialic acids.

MATERIAL AND METHODS

The material for the study was twenty dogs, selected according to the principle of analogs, sick with acute catarrhal bronchopneumonia. The dogs were divided into two groups of 10 animals each. Each animal was monitored for 20 days. During this time, animals were subjected to clinical, X-ray, hematological researches. Dead animals were also subjected to pathoanatomical studies.

The determination of sialic acids was based on photometric analysis. Photometric analysis is one of the oldest and most common physical and chemical methods, it requires relatively simple equipment, at the same time it is characterized by high sensitivity and the ability to determine a large number of organic substances. The discovery of ever new reagents forming colored compounds with inorganic ions and organic substances, the development of the principles of conjugate reactions makes the application of this method almost unlimited at present.

The photometric analysis method can be used for a large range

Determined concentrations. It is used both for determining the main components of

various complex substances, and for determining the trace impurities in the objects.

Combination with some methods of separation and enrichment - chromatographic, extraction - allows to increase the sensitivity of photometric methods by several orders of magnitude.

The photometric properties of the solute are characterized by the transmittance T (τ), the reflection coefficient R (ρ), and the absorption coefficient A (α), which for the same substance are related by the relation $T + R + A = 1$. The determination of the dimensionless quantities T , R and A is performed using photometers (instruments for measuring a photometric value) by recording the reactions.

Receiver of optical radiation on the corresponding radiation fluxes. In routine laboratory practice, it is customary to designate devices that detect the absorption of light by matter, photometers, and reflection by reflective photometers [6].

The treatment of animals was carried out in a complex manner. Thus, in the first group we used mucaltinum 0.5 g orally twice a day up to recovery, bicillinum-3 50 thousand UA/kg once every three days intramuscularly, dissolving in 2 ml of isotonic sodium chloride solution and vitaminum B₁₂ 1 ml once a day subcutaneously during 10 days. In the second group we used mucaltinum 0.5 g orally twice a day up to recovery, bicillinum-3 50 thousand UA/kg once every three days intramuscularly, dissolving in 2 ml of isotonic sodium chloride solution, intradermal leidase 32 UA with 1 ml 0.5% solution of novocaine for 3 consecutive days, then 3 times a week, traumeel lymphotropically regionally for three consecutive days, 1 ml intradermally, then every three days and phosphor-homaccord lymphotropically regionally 1 ml every three days up to recovery.

RESULTS AND DISCUSSION

At the beginning of treatment, the animals showed characteristic signs of bronchopneumonia. Among these signs was an increase in the level of sialic acids, which indicates the inhibition of the general state of the organism. On the X-ray pictures we saw lands of inflammation, from a pigeon to a hen's egg on size, the veiling of the borders of

the lungs, the blurring of the overall picture of the thoracic cavity. During the treatment the condition improved, and more clearly it is

noticeable in the group where we used complex antihomotoxic therapy (Table 1).

Table 1 The results of complex therapy

Group of animals	Number of animals	Results of treatment			
		Duration of treatment (days)	Total recovery	Came to chronic condition	Died
I	10	17-19	7(70%)	2(20%)	1(10%)
II	10	10-12	9(90%)	1(10%)	-

The effectiveness of complex antihomotoxic therapy may also be confirmed in studies of the dynamics of sialic acids. So, if in the beginning of treatment the concentration of sialic acids was increased,

then in the process of treatment and to its completion this indicator approaches the norm. Moreover, in animals of the second group it came more rapidly than in animals of the first group (Table 2).

Table 2 The dynamics of sialic acids concentration, u/l

First group (n=10)			Seacond groupe (n=10)			The middle figure of clinically healthy animals
1 day	10 day	20 day	1 day	10 day	20 day	
0.454±0.68	0.35±0.66	0.245±0.55	0.475±0.54	0.255±0.04	0.195±0.64	0.16±0.66

As a result of the conducted studies it was established that complex antihomotoxic therapy with using traumeel and phosphor-homaccord is effective. It was also found that complex antihomotoxic therapy is more qualitative and takes less time, in comparison with traditional therapy.

Low-effective allopathic therapy, conducted in dogs of the first group using bicillin-3, is probably related to its effect on pathogens, which manifests itself in the form of intoxication by products of massive death of microorganisms, dysbiosis, superinfections, vitamin balance and sedative effects on protective and adaptive reactions of the organism, including the immune status of the animal.

Using of complex therapy with complex antihomotoxic preparations traumeel and phosphor-homaccord is based on the fact that they complement the positive effects of each other, which manifests itself in increasing the protective systems of the organism.

Moreover, they stimulate phagocytic activity of leukocytes and the entire monocytic system as a whole, thanks to mesenchymal and fibroblastic activity contribute to the localization of inflammation, in premorbid conditions - cause exacerbation of the inflammatory process with subsequent normalization and complete recovery, stimulate blocked enzyme systems in acute intoxications, compensate for the negative effect the environment on the organism and are regulators of the Krebs cycle.

CONCLUSIONS

1. Bronchopneumonia is common in dogs
2. One of the most important indicator of catarrhal bronchopneumonia is the level of sialic acids
3. complex antihomotoxic therapy with using complex antihomotoxic preparations traumeel and phosphor-homaccord is more effective compared with traditional therapy.

REFERENCE

- [1]. Aksenova V.M., Leonteva N.B. Diagnostika i lechenie bronhopnevmonii u sobak. / Materialyi mezhdunarodnoy nauchno-prakticheskoy konferentsii. III vyipusk, Troitsk, 2000. -p. 4-5.
- [2]. Barber Hyu R.K. Immunobiologiya dlya prakticheskikh vrachey. M.: Meditsina 1980. – 352p.
- [3]. Chubov Yu.A. Gomotoksikologiya v veterinarnoy meditsine». - Odessa, «Mir». - 2000. – 232p.
- [4]. Chubov Yu.O., Kushnir V.Yu. Netradytsiyni metody terapiyi tvaryn. Odesa, 2017, 114p
- [5]. Danilevskaya N.V., Korobov A.V., Starchenkov S.V., Scherbakov G.G. Spravochnik veterinarnogo terapevta (pod red. A.V. Korobova, G.G. Scherbakova / Seriya «Mir meditsinyi». - SPb., «Lan», 2000. -384 p.
- [6]. Dolgov V.V., Ovanesov E.N., Schetnikovich K.A. Fotometriya v laboratornoy praktike. Moskow, 2004. P.7-8
- [6]. Levchenko V.I., Kondrakhin I. P., Vlizlo V.V. [etc.]; Vnutrishni khvoroby tvaryn / by red. V. I. Levchenka. – Bila Tserkva, 2012. – P.1. – 528 p.
- [7]. Zilber L.A. Osnovy immunologii. M.: Medgiz, 1958.