

A study of efficacy of polyphenols (contain Pycnogenol®) in combination therapy of mitral valve insufficiency in dogs

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Abstract

Polyphenols (Pycnogenol complex), having strong antioxidant effect, were introduced to 16 dogs suffering from mitral valve insufficiency. Improvement of clinical signs of the disease was observed in 11 of 16 cases. In 2 of 3 patients with high atrial natriuretic peptide (ANP) ANP values dropped sharply after administration of polyphenols. In addition, there was an improvement of patient quality of life, in particular, syncope disappearance in those, who suffered from arrhythmic attacks.

Key words: polyphenol, Pycnogenol®, mitral valve insufficiency, dogs, atrial natriuretic peptide ANP

Introduction

Pycnogenol is a bark extract of **Pine maritime**, which grows on the south-west coast of France. It is a safe water-soluble natural biologically active food additive, which has many useful properties for the body. Pycnogenol contains proanthocyanidins and more than 40 organic acids. Active pycnogenol compounds are a group of bioflavonoids with strong antioxidant properties and ability to reduce reactive oxygen species. It belongs to the group of polyphenols.

At the present time, research laboratories all over the world are engaged in the study of pycnogenol. At the moment, about 300 research reports have been collected. It is proved that pycnogenol use in medicine demonstrates its efficacy in treatment of endometriosis, menopausal disorder, arthritis, diabetes and other diseases. A number of positive results were observed in treatment of cardiovascular diseases, for example, improvement of microvascular circulation and alleviation of symptoms in deep vein thrombosis (so-called “economy class syndrome”). In a number of countries, pycnogenol is available only on prescription. Despite studying of efficacy of pycnogenol in medicine, similar studies were not carried out in the field of veterinary medicine.

It is well known that many cardiovascular diseases in animals are similar to those in people. Among them mitral valve insufficiency is a very common disease. With the advent of the scardiotonic agent, such as pimobendan, improvement of quality of life of dogs suffering from similar ailments was noted. Invasive surgical treatment became possible. However, when selecting a treatment through pharmacological agent administration it is difficult to control the course of the disease even with the help of pimobendan.

The object of this study was mitral valve insufficiency in dogs, and the subject was the efficacy of treatment of this disease with pycnogenol, which has strong antioxidant action, as well as the potential of improvement of microvascular circulation. A distinct improvement of quality of life was noted as a result of the study. Let's give a detailed report.

Methods and materials

The study involved 16 dogs, suffering from mitral valve insufficiency (Ia – IIIb according to the ISACHC classification, cardiology of small pets), which are in 13 animal care centers in Japan. Most of animals have already received drug therapy. The trial period was 30 days, during which no changes were made to the prescribed treatment with one exception. Only pycnogenol was added to the already administered

pharmacological agents and other additives. Small and medium sized dogs were prescribed two tablets of polyphenol (manufacturer: Scarecrow JSC, Tokyo) twice a day (1 tablet contains 30 mg of pycnogenol). In seven cases, preliminary tests were performed before drug prescription. Chest x-ray (to the fullest extent possible) and echocardiography were performed, a blood test was performed, blood pressure was measured, as well as atrial natriuretic peptide parameters were measured (it is fundamentally important). In other nine cases, primarily during the examination, a change of clinical signs of the disease was revealed.

Results

In 11 of 16 cases a clear improvement of quality of life was noted, the frequency of spasmodic cough decreased, the breathing improved. As for the patients, who underwent a detailed examination, in three of seven cases abnormally high ANP value was detected. In two of them indicators sharply dropped after administration (see table 1). Moreover, one of these two patients suffered from sick sinus syndrome, fell fainted several times, even being at rest. Approximately in 2 weeks after polyphenol prescription, syncope due to arrhythmia disappeared.

Study

Pycnogenol has a catalytic effect on the endothelial NO-synthase (eNOS) of blood vessels and promotes the synthesis of nitric oxide, which has a vasodilatory action. Presumably, due to suppression of endothelin-1 production along with stimulation of prostacyclin production, it has a hypotensive and vasodilatory effect. Based on the results of this study, we can assume that as a result of a strong peripheral vasodilatory effect circulating blood is redistributed throughout the body, thereby reducing the load on the heart. Improvement of quality of life along with improvement of clinical signs of the disease can be noted. Generally, it is difficult to maintain blood pressure at a normal level in cardiovascular diseases due to heart failure. Due to such a phenomenon as homeostasis, the sympathetic nervous system narrows peripheral blood vessels in order to stabilize blood pressure. However, it increases the volume of blood, circulating to the heart, thereby worsening heart failure symptoms. Thus, it can be concluded that due to its vasodilatory effect pycnogenol relaxes vessels of the whole body, reduces the load on the heart, in consequence of which left atrial pressure reduces, breathing capacity improves (pulmonary edema reduces) and ANP values decrease.

In one case, polyphenol showed efficacy in arrhythmia. Presumably, due to the strong vasodilatory effect of the drug, coronary arteries were enlarged and the supply of oxygen and nutritional substances to the heart conduction system was improved. As a result of blood circulation improvement, the duration of sinus arrest decreases, syncope disappears.

It should be noted that in the future the drug can be effectively used not only in mitral valve insufficiency in dogs, but also to alleviate the condition of dogs, suffering from dilated cardiomyopathy, cats with hypertrophic cardiomyopathy, as well as in renal failure. According to the reports, pycnogenol prevents damage of human endothelial vessel cells. Therefore, it can be supposed, that it will be effective in pulmonary artery damage as a result of filariasis in dogs.

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Table 1. Change of ANP values during polyphenol administration

Clinical case, No.	Before administration (pg/ml)	After a month of administration (pg/ml)
1	101	65.4
2	25.6	25.1
3	45.3	32.1
4	215.1	53.4
5	24.5	16.7
6	136.8	127.1
7	23.1	31.4