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Dissertation title: Assessment of diet, quality of life and the effect of dietary supplementation with lyophilizate of fruits of dogwood (*Cornus mas* L.) on nutritional status and body composition of people with metabolic syndrome

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Abstract

A balanced diet and regular daily physical activity have a significant impact on body weight in patients with metabolic syndrome (MetS). Research shows that the systematic implementation of a rational diet can have a positive impact on the body composition of patients with MetS and can play an important role in supporting the treatment of or preventing hypertension. Despite increasing nutrition and health awareness, the number of people with obesity, insulin resistance, type 2 diabetes, hypertension, atherosclerosis and MetS is steadily increasing. As a result, new nutritional trends are emerging to help prevent disease, support the treatment of allergies and food intolerances as well as aid in weight loss. The antioxidant, anti-inflammatory and immunomodulatory properties of the compounds contained in fruit, vegetables, seeds, nuts, spices, coffee and tea are the subject of intensive scientific research. Although there are studies in literature regarding the influence of biologically active substances contained in dogwood fruits on the parameters of carbohydrate and fat metabolism in animal experiments, the influence of dogwood in people with MetS diets on improving the nutritional status and body composition of sick people is still unknown. Therefore, it is necessary to conduct and continue research with dogwood fruit extract or lyophilizate to explain its effect on obesity and confirm its effect on lowering blood pressure.

The main objective of the study was to evaluate the effect of freeze-dried dogwood fruit (*Cornus mas* L.) on selected anthropometric and biochemical parameters of the blood of patients with MetS. In addition, the level of physical activity and lifestyle of patients with MetS were investigated.

The study started with 52 individuals with MetS, but due to lack of contact and cooperation with some patients, the study was eventually completed with 40 individuals aged 30 to 65. Additionally, at the time of the study, there was an epidemic threat in Poland and freedom of movement was restricted for a certain period of the study; as part of the conclusion and discussion of the results of our own study, a group of 34 patients who had an initial visit (Visit I) and a follow-up visit (Visit II) before the start of the COVID-19 pandemic. An original socioeconomic assessment survey and a questionnaire on the frequency of consumption of products and food (FFQ-6) was conducted on participants. Anthropometric measurements were taken and venous blood was drawn for biochemical tests. The study investigated the frequency of consumption of the main food groups and the nutritional status of patients with MetS. Levels of selected markers of oxidative stress (non-esterified fatty acids and total antioxidant status) and selected adipocytokines (adiponectin and resistin) and caveolin-1 were determined in the subjects' blood plasma.

The collected data from the original survey, the FFQ-6 food frequency questionnaire and the International Physical Activity Questionnaire (IPAQ) were coded accordingly, entered into Statistica 13.3 from StatSoft and data analysis was performed using various tests.

The effects of the proposed dietary intervention, including supplementation with freeze-dried dogwood (*Cornus mas* L.) fruit, on improving the components of the MetS were assessed.

In the study group which received freeze-dried dogwood fruit supplementation, there was a reduction in waist circumference, thickness of skinfolds under the scapula, reduction in body fat mass and extracellular water content, but there was no statistically significant difference between the study group and the control group. The feeding model with the addition of *Cornus mas* L. did not contribute to a significant improvement in the concentration of selected markers of oxidative stress (non-esterified fatty acids and total antioxidant status) as well as adiponectin and resistin. However, positive changes in the results of anthropometric measurements were observed in all subjects during the study regardless of dogwood supplementation. The thickness of the skin folds over the triceps muscle and the iliac crest decreased significantly. At the same time, a significant increase in intracellular water content, cell body mass and phase angle was observed. In addition, the dietary intervention had a significant effect on blood pressure parameters - systolic and diastolic blood pressure values were significantly reduced.

It is necessary to continue the research conducted in this dissertation in the group of people with MetS, which would include the implementation of supplementation with higher doses of dogwood to verify the effects on the parameters of carbohydrate and lipid metabolism,

which have so far only been confirmed in studies with animals, and to improve the anthropometric parameters and body composition of patients with MetS.

Keywords:

dietary supplementation, dogwood (*Cornus mas* L.), obesity, metabolic syndrome, anthropometric parameters, nutritional status, nutrition