

Physical activity, pro-health training and diet in selected disease entities

Aktywność fizyczna, trening prozdrowotny oraz dieta w wybranych jednostkach chorobowych

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Abstract

Healthy lifestyle, of which integral part is physical activity and proper diet, has an essential influence on the level of occurrence of various illnesses, as well as a human lifespan. Positive aspects of physical activity include: removal of negative factors of contemporary life (stress, mental overload by intellectual work, hypokineses), prevention of overload of the musculoskeletal system, spinal pains, as well as diminution of the risk of occurrence of various illnesses like obesity, overpressure, atherosclerosis and diabetes. It also strengthens the body and increases immunity. The diet of people who lead an active lifestyle should have a high nutritional value, which means that it should provide the proper amount of energy mainly in form of carbohydrates (the proper amount of liquids with electrolytes is also very important). The guiding principle of any diet should be its variety and balance. Besides, the diet must be adjusted to the treatment programme of a specific disease. The aim of this dissertation is to present the influence of physical activity, pro-health exercises and proper diet on the treatment of selected diseases.

Keywords: physical activity, pro-health exercises, diet, diseases depending of diet

Physical activity and pro-health training

Physical activity has been considered beneficial to our body since the early days. In the ancient times Hippocrates and Galen recommended movement and systematic exercise in the case of some disease entities. Combined with proper nutrition, movement prolongs life and improves its quality. As noted by Samuel August Tissot, an 18th-century promoter of medical knowledge, *movement can replace all medicines, but no medicine can replace movement*.

Physical activity is body movement caused by the work of the skeletal muscles [1]. The effect of physical activity, i.e. muscle work, is energy expenditure exceeding the level of resting metabolism. In highly developed countries, the adult's daily energy demand does not exceed 2,100 kcal/24h. It is only 400–500 kcal more than the caloric demand resulting from basic metabolism. In order to burn 400 kcal, one needs to walk 7 km, or walk for 1.5 hours [2].

Positive aspects of physical activity include: removal of negative factors of contemporary life (stress, mental overload by

intellectual work, hypokineses), prevention of overload of the musculoskeletal system, spinal pains, as well as diminution of the risk of occurrence of various illnesses like obesity, overpressure, atherosclerosis and diabetes. It also strengthens the body and increases immunity. Important biological effects of physical activity are:

1. increase in volume of heart cavities and improvement of its vascularity, increase in blood volume, amount of erythrocytes and hemoglobin [3],
2. fat reduction [4],
3. optimisation of tissue oxygenation, increased vital capacity of the lungs and improvement of exercise tolerance [5],
4. increase in antioxidant activity [6].

As much as 40% of human health depends on the lifestyle, which consists of: regular physical activity, healthy diet, ability to control stress. It is a consciously managed process, which consists in the deliberate use of specific physical exercises to obtain physical and mental effects, counteracting the age-related process of decreasing physical capacity. The action of a sufficiently strong stimulus triggers the body's response and leaves behind shorter or longer lasting functional changes. Training should be rational, that is, it should utilise forms of movement

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selected appropriately in terms of the type of activity, strength of a stimulus and its duration [7].

Achieving an increase in exercise capacity requires repeated, systematic action of training stimuli. In addition to developing overall fitness, one should shape or maintain overall performance as measured via maximal oxygen uptake (VO_{2max}). The best results are achieved by using such forms of movement that meet the expectations of the exerciser. The adaptation process must develop continuously. Adaptation changes and movement habits are not permanent.

A break in training leads to regression of training. The volume of the training load is the size of the stimulus that causes the adaptive response. When used systematically, the stimulus creates an adaptation state, i.e. a training state. The volume of load can be modified by changing the intensity and duration of the training.

Training compliance is important here, i.e. the body's ability to respond to training effort with a compensatory response. An effective training stimulus is one that triggers this compensatory response.

Subliminal training stimuli will not cause such a reaction, and stimuli that are too strong can lead to a disorder of the body's functions, because they exceed its adaptability. Adjusting the training cycle to the biological rhythm of body function is very important in this case [8].

It is necessary to remember about the so-called microcycle: muscle work – post-training renewal. Compensation and supercompensation occur in the post-training period, so physical effort alone without a rest period does not make much sense. There are three distinctive stages in pro-health training for adults: initial exercise stage, enthusiastic exercise stage, rational exercise stage.

The initial exercise stage lasts from 10 to 16 weeks, depending on the regularity of trainings, health status and initial level of fitness of the person performing the exercises. The most important thing at this time is to convince oneself that starting systematic exercises has purpose and is necessary. The intensity of training, e.g. running, should be low. Too high loads may cause an overload of the body, exacerbation of an old disease or emergence of a hidden disease, e.g. latent coronary artery disease, hypertension, osteoarthritis [9].

When the intensity of the training is appropriate, injuries to the musculoskeletal system, e.g. ankle or knee joint overload (which affect 15–25% of those starting their exercises) pose the only real threat. It is necessary to select appropriate footwear, choose soft-ground routes for running, avoid running on hard surfaces. The training should start with a warm-up including flexibility exercises. During this period it is good to exercise in a group.

The enthusiastic exercise stage is the period when most mistakes are made. Usually, these errors involve choosing too low or too high loads. Too small loads do not allow further improve-

ment of fitness, and too high cause excessive fatigue, put the musculoskeletal system at risk of injury and even reduce fitness of the body.

The rational exercise stage is the stage in which, due to the experience gained earlier, the person performing the exercises can properly choose the stimulus to achieve the intended goal through minimal effort. It is an effective and economic stimulus [8, 9].

Absolute contraindications to training: early period after myocardial infarction, overt circulatory insufficiency which is difficult to treat, valvular heart disease, especially cyanotic, significant heart enlargement in the course of myocardial disease, severe arrhythmias, uncontrolled diabetes, hypertension (above 180/110 mmHg at rest) and acute infectious diseases.

Relative contraindications to training: slight heart enlargement in the course of organic disease, treatable circulatory insufficiency, pacemaker, respiratory diseases in the exacerbation phase, diabetes corrected by insulin or other drugs, early period after internal haemorrhage, acute and chronic urinary tract diseases, treatable anaemia, drug-controlled hypertension, peripheral vascular diseases, chronic arthritis requiring intensive analgesic treatment, chronic infectious diseases, diseases with seizures or brief unconsciousness, not fully treatable [10].

Norms of physical activity – recommendations for adults:

1. increasing energy expenditure by 150 kcal per day, or by 1000 kcal per week in relation to the sedentary lifestyle is sufficient to improve health [11],
2. increasing energy expenditure to 3–4 kcal/kg body weight per day, which is equivalent to 30 minutes of fast walking per day [12–14],
3. reducing the weight in the case of women and men by 10% through long-term physical activity of medium intensity (continuous effort 30 minutes a day),
4. the norm should be a daily “portion” of movement lasting a minimum of 10 minutes with an intensity of 80% of the maximum intensity [15, 16].

Selected diet dependent diseases

Diabetes

All over the world, over 100 million people suffer from diabetes. Diabetes is not a single disease, but rather a syndrome of diseases. According to statistics, more than 2.5 million Poles suffer from it. However, this is only the number of people who are aware of the disease, while almost the same number of the Polish population lives with diabetes without realising it. Diabetes is the result of a deficiency of insulin, i.e. the hormone produced by the pancreas, in the body. Insulin has a significant impact on how metabolic processes occur in humans, because it participates in their regulation. When there is insufficient amount of it in the body, hyperglycaemia occurs [17].

Normal blood glucose is 70–99 mg/dl. A higher level (measurement should be performed on an empty stomach) may indicate the onset of hyperglycaemia, and the lower one of equally dangerous hypoglycaemia.

Hypoglycaemia is a condition where blood sugar drops below 55 mg/dl. Its typical symptoms are confusion, anxiety and respiratory problems. It is often the result of an overdose of diabetes medications. If it occurs, the patient is given a sweet liquid to drink, and if he is unconscious, it is rubbed on his mouth, glucose will then be absorbed through the tissues. The brain needs glucose to function properly, so it's important to take these steps immediately.

Diabetes is often diagnosed by accident, because its main symptom is increased blood glucose, which on a daily basis does not give troublesome symptoms, especially with type 2 diabetes.

The following may be characteristic for the disease: polyuria, increased thirst and appetite, weight loss, nausea, drowsiness, chronic fatigue, glucose and ketone bodies in urine, muscular cramps intensifying especially at night, blurred vision and various types of skin changes [17, 18]

There are three types of diabetes:

– type I – when insulin is not produced at all (this may be due to immunological changes, but it is not possible to determine the cause). In the case of type 1 diabetes, pancreatic islet β cells are destroyed. The immune system and genetic factors play a significant role here. Type 1 diabetes occurs in 10–15% of all diabetics [19].

– type II – when organs and tissues become resistant to insulin and its action is hindered. It is often the result of obesity. It is also a complication of some metabolic diseases, e.g. polycystic ovary syndrome. It is based on reduced sensitivity of tissue to insulin (insulin resistance). This condition requires the production of excessive amounts of insulin, which in the further course of the disease exceeds the secretory capacity of the pancreas.

The mechanism of acquired insulin resistance causes glucotoxicity (the negative effect of hyperglycaemia on tissues) and lipotoxicity (higher levels of fatty acids in the blood), which leads to disturbances in the storage and secretion of glucose from fatty tissue and the liver begins to produce these sugars in excess. In the case of type 2 diabetes, beta-cells in the islets of the pancreas become damaged and impaired, after which insulin secretion stops.

– type III – diabetes of unknown origin. When it occurs, the pancreas does not work properly. It can be caused by some drugs and microorganisms that enter our body, it is also suspected to be a hereditary disease.

The so-called gestational diabetes is considered to be of special type. In this case, many of the typical symptoms of the disease that are noticeable during pregnancy disappear after child birth. However, it may lead to fetal death. It develops in approximately 5% of pregnant women. It occurs due to hormo-

nal changes. Pregnancy causes increased tissue resistance to insulin. It increases the risk of occurrence of type 2 diabetes in a woman [17].

The highest risk of developing diabetes in the case of pregnant women occurs among: very obese women who had diabetes during the previous pregnancy, if someone in the family has diabetes, if the woman is more than 25 years old, if she had previously given birth to a child weighing over 4 kg.

Diabetes treatment primarily involves:

1. taking anti-diabetic drugs,
2. administering insulin depending on the type of disease and the patient's condition,
3. maintaining a diet and engaging in physical activity.

Untreated diabetes may cause various complications: retinopathy, nephropathy, neuropathy, coronary artery disease, diabetic foot syndrome and ischemic nervous system disease [17–19].

According to the latest recommendations of the American Diabetes Association, uncomplicated diabetes is not a contraindication to physical activity or even competitive sports. Physical activity is for diabetics an indispensable element of pro-health activities, preventing, among others, complications from the cardiovascular system. Physical activity is for diabetics an indispensable element of pro-health activities, preventing, among others, complications from the cardiovascular system.

The impact of physical activity on the patient's body is multifaceted:

1. improvement of glucose metabolism and glycemic control,
2. increase of tissue sensitivity to insulin,
3. decrease of the need for insulin and oral drugs,
4. improvement of lipid profile,
5. low blood pressure,
6. increase of efficiency of the body,
7. balance in terms of proper body weight,
8. beneficial psychological effect (mood improvement, stress reduction).

Excessive training may lead in the case of diabetic patients to deepening latent retinopathy or nephropathy and cause symptoms of circulatory insufficiency to appear. In patients treated with insulin, before starting pro-health training, an individual exercise plan should be developed that accurately determines the intensity and duration of activity. Training planning rules: moderate effort reduces plasma glucose by at least 25%, response to exercise depends on pre-exercise glucose, post-exercise hypoglycaemia may occur, training should be systematic, at least 4 times a week for 20–60 minutes, should be of aerobic or resistance type and moderate in intensity [20,21]. The latest research by Guelfi et al., 2005 [22] suggests the desirability of ending moderate exercise with a 10-second high-intensity activity that will release glucose from extra-muscular sources.

High-intensity exercise ($> 80\% \text{VO}_{2\text{max}}$) may cause prolonged hyperglycaemia. An important problem to consider when plan-

ning a training is the chronic nature of diabetes and co-occurring complications. The increased tissue sensitivity to insulin obtained through training probably disappears within a week after ceasing exercise [22, 23].

Particular attention in the case of this disease should be paid to carbohydrates that raise blood glucose levels. Diabetic meals should contain as many whole grain carbohydrates with relatively low glycemic index or glycemic load as possible. These are e.g. wholemeal pasta, dry legume seeds, whole grain rice. Properly balanced food is one that in addition to complex carbohydrates contains in its composition fibre, proteins and fats, because it does not cause a sudden increase in blood glucose levels. There are a few rules to keep in mind when preparing meals: steam or water cooking is the most beneficial, frying is not recommended, low-fat thickeners (e.g. yoghurt or kefir) should be used in sauces, it is worth limiting the amount of salt, overcooked vegetable and cereal dishes can increase glucose levels, plain sugar can be substituted with other products, e.g. xylitol or brown sugar [18, 21].

Obesity

Obesity is a metabolic disease, one of the biggest health problems of the modern world. In Europe, obesity affects 10–25% of men and 10–30% of women. Obesity ranks second on the list of diseases most often affecting Poles (it is right behind hypertension). Statistics show that the highest percentage of people struggling with overweight live in highly developed countries. According to available data in Poland, approximately 60% of the population suffers from overweight and obesity. Excessive body weight is the cause of 80% of type II diabetes, 35% of ischemic heart disease and 55% of hypertension. According to WHO, obesity is a disease characterised by excess fat that constitutes over 25% of body weight in the case of men and over 30% of body weight in the case of women [24].

The distribution of body fat is also important. Visceral (apple-shaped) obesity is more dangerous. In Europeans it is recognised (according to the International Diabetes Federation) when the waist circumference in men exceeds 94 cm, and in women 80 cm.

Obesity is not just a separate disease entity, its occurrence is associated with malfunctioning of the cardiovascular system. 95% of cases is a systemic disease caused by the accumulation of unused calories in the form of fat. However, there is also genetic obesity. There are many causes of obesity. Among them, there is a group of environmental factors, such as poor nutrition and low level of physical activity. People with a congenital tendency to obesity should be especially careful about what they eat.

It is worth remembering that no one is born obese, and getting to a medical condition is a lengthy process. It is preceded by excess weight, resulting mainly from improper nutrition, i.e. excessive consumption of simple carbohydrates, cis and trans

fats, which clog the veins with cholesterol. A state of significant overweight should be a signal that the body stops functioning properly. Just as elevated body temperature informs about the infection, so overweight should indicate the need to fight with unnecessary kilograms. There is a good chance that the treatment will succeed if reflection occurs on time.

Factors that cause obesity also include stressful lifestyles, continuous professional competition, and excessive consumerism. Stress does not cause weight gain on its own, but the way of dealing with it does. Most often, people try to fight it by reaching for unhealthy food, including sweet snacks [25, 39].

In the treatment of obesity, the most important are motivation, strong will and realisation that one can recover only by changing one's lifestyle and habits. You should eliminate some foods from your daily menu and find time for regular exercise. It should be emphasised that excessive starvation is not a method of fighting obesity. It is best to follow the advice of a nutrition specialist, because a significant reduction in body weight of 2–3 kg per week can cause other diseases. The optimal solution is to lose 0.5 kg of body weight per week.

Before starting exercise, there should be no contraindications to physical activity. In the presence of co-occurring cardiovascular diseases, an exercise trial should be performed and the patient's exercise tolerance should be determined. Physical activity in the treatment of obesity is divided into daily and planned.

Everyday activity is any form of movement during the day: walking up the stairs, road to the store, cleaning, washing a car etc. Planned activities are usually general or low intensity general exercise, involving large muscle groups. The following are recommended: fast walking, run/walk, cycling, swimming or water exercises, aerobics, team games, gymnastics, cross-country skiing, tennis, dance.

Suitable exercises for obese people that do not overload the joints include swimming, water aerobics or pilates. To determine the intensity of exercise, the maximum heart rate formula is used: $HR_{max} = 220 - \text{age}$. 60–70% HR_{max} is used as the target training heart rate. It is assumed that one should undertake 30–60 minutes of activity in order to combat obesity, preferably seven days a week.

The workout should start with a warm-up and end with calming exercises. Additionally, strength training should be introduced to strengthen individual muscle groups: abdominal, gluteal and back muscles. It is necessary to do 8–10 exercises, 12–15 repetitions each. This training should be repeated 2–3 times a week [26, 27].

The diet of people with obesity should include nutritious products with a low glycemic index and glycemic load, especially fruits and vegetables that allow to provide the right amount of minerals and vitamins, as well as low-fat milk. The same food preparation rules apply as for diabetics

In the case of obese people, it a good idea to eat meals frequently, but reduced in size. As a result to this, the process of

converting nutrients into energy will go more efficiently. Foods that could cause bloating, and would be hard to digest, such as French fries or bigos, should be also limited. Low-fat poultry, vegetables and fruit are recommended, preferably steamed or eaten raw [12–14].

Arterial hypertension

This is a permanent increase in blood pressure due to dysregulation of homeostatic mechanisms. It belongs to the most common chronic diseases in Poland. It is a disease that can be effectively prevented, which reduces the risk of its complications:

1. chronic cardiac insufficiency,
2. stroke, damage to the walls of blood vessels,
3. chronic kidney disease.

Hypertension, which increases the risk of cardiovascular disease, is a term that is used when referring to blood pressure exceeding prescribed standards. Normal blood pressure is 110–130 mmHg for systolic pressure and 70–75 mmHg for diastolic pressure. Norms change with age. When systolic pressure above 140 mmHg is noted for a long time and diastolic pressure above 90 mmHg, the disease may be diagnosed. Many studies show that increasing diastolic blood pressure by every 5 mmHg increases the risk of stroke by 34% and coronary heart disease by 21%. Any increase in systolic pressure of 20 mmHg: doubles the risk of stroke, coronary artery disease and other vascular changes. Due to the high probability of serious complications, antihypertensive therapy

About 90% of hypertension cases are primary hypertension of unknown aetiology. Primary hypertension is a multi-genetic syndrome with little effect of individual genes on the pressure value. Only the sum of the effects of several genes causes hypertensive disease.

Secondary hypertension with a known cause constitutes about 10% of cases. Causes causing secondary hypertension include: kidney disease, renin-secreting tumours, hyperthyroidism or hypothyroidism, hyperparathyroidism, acute stress, sleep apnoea syndrome, certain drugs (corticosteroids, oral contraceptives), toxic substances (amphetamine, cocaine), alcohol, nicotine.

Hypertension is also associated with other causes:

1. with excessive sodium intake,
2. too low potassium intake,
3. overweight and excessive alcohol consumption.

Systolic pressure increases with age in both sexes. Diastolic pressure increases to around 60 years of age, then stabilises or decreases slightly. The incidence of hypertension in Poland is estimated to be at about 36%. Hypertension occurs in about 42% of men and 32% of women. Blood pressure depends on the cardiac output and total vascular resistance. Cardiac output is reduced and vascular resistance increased in the case of people with hypertension. The reason for the increase in vascular resistance may be a decrease in capillary density, reduced vas-

cular elasticity, and narrowing of the lumen of the vessels. Environmental factors affecting the development of hypertension are obesity, especially abdominal form (WHR!), low physical activity, alcohol, nicotine, a high-sodium diet, low in potassium and calcium, and chronic stress.

In recent years, much research has been devoted to identifying the factors that cause hypertension. The results indicate that they depend on geographical conditions, socio-cultural and economic situation. It has also been shown that a high percentage of cases occur in highly developed and industrialised countries (USA, Canada). In 2000, studies were conducted on approximately 972 million people diagnosed with hypertension, and it was found that more than 600 million of them were from highly developed countries. Scientists assume that in 2025, hypertension will affect 1.5 billion people. According to research conducted as part of the WOBASZ (National Health Survey) project in Poland, approximately 40% of men and approximately 30% of women are suffering from hypertension [28].

The first step in treating hypertension is to follow a proper diet and develop habits related to healthy eating, combined with drug therapy. It is also important to reorganise one's lifestyle into a less stressful one and include physical activity in your daily schedule. All these changes can positively affect our mood and self-esteem. However, it is necessary to mention their effects: delaying and inhibiting the disease, stopping the process of hypertension in young people, postponing the use of drugs, lowering blood pressure.

One of them is limitation of the amount of salt. Doses of 4.35–6 g per day are enough to lower blood pressure by 2–8 mmHg, which may also contribute to the increase in the effect of antihypertensive drugs and allow their doses to be reduced. A significant amount of salt in food negatively affects the cells (increases their stiffness and reduces their size). Many studies indicate the positive effect of potassium on reducing blood pressure. Both healthy and ill people showed a reduction in systolic and diastolic pressure when a daily dose was increased by 0.6 g. Increased urinary potassium excretion also contributes to lowering blood pressure. Increasing the amount of potassium in the diet affects the relaxation of blood vessels, improves insulin sensitivity and reduces the risk of cardiovascular events [28–30].

An important role in the treatment of hypertension, in addition to pharmacology, is physical effort and pro-health exercises. There is an inverse relationship between blood pressure values and the degree of physical activity and performance. Even one-time aerobic exercise causes a 4 to 16 hour decrease of the value of systolic and diastolic pressure by 2–12 mmHg in both healthy and hypertensive patients. This phenomenon is described as post-exercise hypotension that may be a consequence of immediate changes in the cardiovascular system and metabolic changes associated with physical exercise.

In order to lower post-exercise blood pressure in older people, low intensity exercise (40% $\text{VO}_{2\text{max}}$) lasting 30–50 minutes is

sufficient. Younger, more fit men need more intense exercises (60% $\text{VO}_{2\text{max}}$). Endurance and aerobic training (walks, runs, bicycle, cycloergometer) is the most fitting in this case.

Strength exercises do not give such good results. Regularity and frequent repetition of training lead to a faster and permanent reduction in blood pressure. Satisfactory results are observed only after a few months of exercise. In some patients, who were unable to lower the pressure through pharmacological treatment, this effect was achieved by systematic physical activity. Even if blood pressure cannot be permanently lowered, physical activity reduces the risk of cardiovascular complications. Reducing blood pressure by as much as 2 mmHg reduces the risk of stroke by 14% and coronary heart disease by about 7%. Exercises should be planned individually, and blood pressure during rest and exercise should be regulated and regularly monitored. An interview and physical examination should be conducted [31–33].

The combination of physical activity with a diet that causes a decrease in body weight may result in reduction of systolic pressure by up to 20 mmHg, and diastolic pressure by 10–15 mmHg. It is reasonable to calculate the daily caloric demand in accordance with the following formula: $\text{PPM} \times \text{PAL}$ (basal metabolic rate \times physical activity level)

- Exemplary daily caloric demand: $\text{PPM}: 70 \text{ kg} \times 24 \text{ Kcal}$, that is approx. $1680 \text{ Kcal} \times \text{PAL } 1.4$ (medium activity)
- $\text{CPM}: 1680 \text{ Kcal} \times 1.4 = 2352$

Such energy demand of the body allows for maintaining one's current body weight. For slimming to be healthy and effective, one just needs to subtract 200–400 kcal from this result. It is worth mentioning that some of the dietary supplements used by athletes can help lower blood pressure. One of them is l-arginine, which binds nitric oxide in a chemical process. It can be consumed or administered intravenously. Studies show that l-arginine influences consumed pharmacological agents on a hypotensive basis. Four weeks of taking this supplement at a dose of 10 g per day is enough for systolic pressure to decrease by about 6.2 mmHg and diastolic pressure by about 7 mmHg, but there is no scientific evidence that taking l-arginine for a long time contributes to significant pressure reduction. Other substances used for synthesis of nitric oxide are nitrates (also called nitro compounds), whose mode of action is similar to that of l-arginine. Beetroot juice contains a large amount of nitrates, but they can be also found in other vegetables, but in smaller doses [37].

L-carnitine is another important supplement. It exhibits antihypertensive activity, but also indirectly participates in the transfer of fatty acids from the cytoplasm to mitochondria and reduces the level of oxidative stress (disruption of the balance between free radicals and antioxidants). In studies, during which l-carnitine was administered daily for 8 weeks, no significant changes in diastolic pressure were noted, but systolic pressure dropped by 7–9 mmHg [12–14].

Taurine is another product that can significantly help in the

fight against hypertension. Large quantities of it can be found in our brain, heart and muscles. Taurine is found in protein products. It is considered that it slows down the pulse, and also excretion of sodium in the urine.

Omega-3 fatty acids, such as DHA and EPA, which have antihypertensive effects as well, also significantly reduce blood pressure. Studies show that by administering 2 g of DHA per day over a six-week period, systolic pressures decrease by about 8 mmHg and diastolic pressures by 5 mmHg. It was also noted that the heart rate dropped by about six beats per minute.

Some minerals and vitamins also have an impact on the effective fight against hypertension. One of such minerals is magnesium, which increases the effect of hypotension and increases the effectiveness of drugs for hypertension. This element significantly reduces the risk of ischemic brain disease (haemorrhagic stroke). 100 mg of magnesium per day is enough to decrease it by about 8%. Vitamin C also causes a slight decrease in pressure, while vitamin D allows for maintaining it at a constant level. It has also been documented that a deficiency of this vitamin may increase the risk of developing hypertension [34–36].

One of the most popular diets used by people suffering from hypertension is the DASH diet, in which higher doses of potassium, magnesium and calcium are taken, and the amount of sodium is reduced to a minimum. This diet involves consumption of a large amount of fruits, vegetables, nutritious products and low-fat dairy products. The diet is based on the division of food products into eight groups: cereal products (7–8 times a day), fruits and vegetables (4–5 times a day), low-fat dairy products, meat, fish, nuts and grains, fats, oils (2–3 times a day) and sweets (5 times per week) [38].

Conclusions

1. Positive aspects of physical activity include: removal of negative factors of contemporary life (stress, mental overload by intellectual work, hypokinesia), prevention of overload of the musculoskeletal system, spinal pains, as well as diminution of the risk of occurrence of various illnesses like obesity, overpressure, atherosclerosis and diabetes.
2. Any physical activity, especially pro-health exercises when ill, must be thought out and planned so as to optimise the effect of exercises.
3. Diet and optimised nutrition have a huge impact on the condition of people who have been affected by diseases related to contemporary civilisation (obesity, hypertension, diabetes). A type of nutrition adapted to the needs of a particular person is a form of treatment as well as a kind of medicine at the beginning of a disease. This means that basic knowledge in the field of dietetics is required.
4. Studies confirm the relationship between meals consumed and health. Some products and supplements help regulate processes in the human body, e.g. lowering blood pressure.

Adequate hydration plays a huge role. For people struggling with cardiovascular disease, the amount of fluid in the body is of particular importance.

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Streszczenie

Zdrowy styl życia, którego integralną częścią jest aktywność fizyczna i prawidłowe odżywianie wpływa zasadniczo na poziom występowania różnych chorób i długość życia człowieka. Pozytywne aspekty aktywności fizycznej to niwelowanie negatywnych czynników współczesnego życia (stresy, przeciążenie pracą umysłową, hipokinezja), zapobieganie przeciążeniom narządu ruchu, dolegliwościom bólowym kręgosłupa oraz zmniejszenie ryzyka powstawania niektórych chorób, np. otyłości, nadciśnienia, miażdżycy, cukrzycy. Aktywność fizyczna ponadto hartuje organizm i zwiększa odporność. Dieta osób prowadzących aktywny tryb życia powinna mieć wysoką wartość odżywczą, to znaczy powinna dostarczać odpowiedniej ilości energii głównie w postaci węglowodanów (bardzo ważna jest również odpowiednia ilość płynów z elektrolitami). Naczelną zasadą każdej diety powinno być urozmaicenie i zbilansowanie. Dieta musi być także dostosowana do programu leczenia konkretnej choroby. Celem artykułu jest ocena wpływu aktywności fizycznej, ćwiczeń prozdrowotnych oraz odpowiedniej diety na leczenie wybranych jednostek chorobowych.

Słowa kluczowe: aktywność fizyczna, ćwiczenia prozdrowotne, dieta, choroby dietozależne
