

SELECTED MODIFIABLE LIFESTYLE AREAS INFLUENCING DISEASES OF THE DIGESTIVE

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ABSTRACT

Thesis. The multifactor aetiology of the diseases of the digestive system is frequently connected with lifestyle, including diet, exposure to stress, and alcohol consumption. These factors are part of the modifiable factors influencing state of health, and the presentation of their influence on the pathogenesis of the diseases of the digestive system may lead to increased social awareness, improved health, and decreased healthcare expenditures.

Concept. The article is a review, presenting the results of latest research on the influence of selected behavioural factors (health behaviours) in the functioning of the digestive system.

Results and conclusion. In order to prevent diseases of the digestive system Mediterranean diet, reduction of alcohol consumption, and looking after emotional wellbeing and physical fitness are recommended. The understanding of health as looking after and enrichment of resources, rather than a lack of illness, is connected with patients' responsibility for their own health. Frequently, it is only with the diagnosis of an illness that patients decide to change their behaviour. Meanwhile, healthy lifestyle ought also



to be understood as one of the most significant elements of the prevention of diseases of the digestive system. Such understanding is part of the paradigm of behavioural gastroenterology (Jia, Jiang, & Liu, 2017), whose representatives emphasise that it is important for healthy lifestyle and psychological factors to be taken into account in treatment as well as diagnosis, rehabilitation, and prophylactics of the diseases of the digestive system.

Key words: behavioural gastroenterology, health behaviours, lifestyle, diet, alcohol, stress, physical activity

INTRODUCTION

The digestive system is one of the most important systems of the human organism. It consists of the digestive tract as well as glands – liver, pancreas, and salivary glands. The main functions of the digestive gland consist in mechanical processing of food, digestion and absorption of nutrients, excretion of undigested food, and influence on immunity.

Diseases of the digestive system frequently lead to appointments with General Practitioners, gastroenterologists, and admissions at emergency departments. According to 2015 data collected in the USA, expenditures on healthcare connected with the digestive system reached 135.9 USD. The most common causes of hospitalisation were: digestive tract bleeding, cholelithiasis, cholecystitis, pancreatitis, bowel obstruction, and liver disease/viral hepatitis (Parkman & Doma, 2006). It is also crucial to note that cancers of the digestive system are some of the most common in the general population. On the basis of 2018 statistics developed by the World Cancer Research Fund colorectal cancer has the third position according to morbidity rate, afflicting 1.8 million people annually (10.6% of all cancers), with stomach cancer at the fifth position (6.1%), cancer of the liver at the sixth (5.0%), and cancer of the oesophagus at the seventh (3.4%) (World Cancer Research Fund, 2018). The multifactor aetiology of the diseases of the digestive system is frequently connected with lifestyle, including diet, exposure to stress, and alcohol consumption. These factors are part of the modifiable factors influencing state of health, and the presentation of their influence on the pathogenesis of the diseases of the digestive system may lead to increased social awareness, improved health, and decreased healthcare expenditures. According to the assumptions of behavioural gastroenterology, healthy lifestyle and psychological factors ought to be taken into account in the treatment as well as diagnosis, rehabilitation, and prophylactics of the diseases of the digestive system (Jia, Jiang, & Liu, 2017).

Health behaviours are understood as behaviours connected with health and the wellbeing of an individual. They are divided into pro-health (e.g. physical activity), and anti-health/destructive behaviours (e.g. consumption of alcohol, nicotine, etc.) (Gruszczynska, Bąk-Sosnowska, & Plinta, 2015).

The paper presents research results connected with the most frequently operation alised health behaviours, such as healthy diet, abstinence, and physical activity. However, in the case of alcohol, nicotine, and other drugs,

the review of research results has been limited to the destructive influence of alcohol on the digestive system, because it is one of the most commonly used psychoactive substances. The influence of stressogenic factors on the digestive system was also taken into account. In numerous cases exposure to stress can be considered a modifiable factor, because it is often the result of lifestyle, including, for example, the inability to relax and ineffective time management, rather than the outcome of difficult circumstances.

TYPE OF DIET AND DISEASES OF THE DIGESTIVE SYSTEM

Diet is a method of nutrition leading to the maintenance of a proper functioning of the organism. The development of globalisation and industry has led to an increase in the consumption of highly processed products, which are defined as those produced from processed and refined foods, that is, e.g., oils, fats, some sugars, or remainders of animal meat. The products contain low amounts of fibre, micro- and macro-elements, with high glycaemic content. Their production is cheap, fast, and the products are tasty and to a large extent ready for consumption (Moodie, 2013). A high level of the consumption of such products has been noted in high-income countries of the North America and Europe, with a tendency to increase in middle-income countries of the Southern Hemisphere, which is caused by the easy availability of this type of food, and its low price (Monteiro, Moubarac, Cannon, Ng, & Popkin, 2013). The increase in the popularity of processed foods and the changes in dietary habits have led to the coining of the term Western diet, based on the consumption of high amounts of protein, particularly coming from red meat, refined oils, saturated fats, sugar, corn syrup, combined with a reduction in the consumption of fruit and vegetables (Zinöcker & Lindseth, 2018). The influence of this diet on obesity, type 2 diabetes, cardiovascular diseases, and cancer (cancer of the intestine in particular), has been demonstrated.

Obesity is a complex condition, based on increased mass of body fat. Body Mass Index (BMI) of 25-29.9 (kg/m²) is considered overweight, and BMI \geq 30 leads to the diagnosis of obesity. According to 2016 WHO data, 39% of women and 39% of men in the world population are obese. The combination of Western diet and sedentary lifestyle leads to the development of the metabolic syndrome, overweight or obesity, impaired fasting glucose (IFG), type 2 diabetes, lipid disorders (decreases HDL concentrations, elevated triglycerides), hypertension, as well as chronic kidney diseases, gynaecological conditions, inflammations of bones and joints, etc. Some of patients with overweight and obesity develop non-alcoholic fatty liver disease (NAFLD), consisting in either non-alcoholic fatty liver (NAFL) or non-alcoholic steatohepatitis (NASH). It is estimated that NAFLD afflicts 17-46% of the population, which is why it is considered the main cause of liver disease. NAFLD may lead to fibrosis, cirrhosis, and hepatocellular carcinoma (HCC) (EASL-EASD-EASO, 2016). According to research results, in 41% of patients NASH leads to the progression of liver

fibrosis, and annual incidence of NCC is estimated at 5.29 per 1000 man-years, and in patients with NAFLD annual incidence of HCC is 0.44 per 1000 man-years (Koenig, 2016). It has been proven that liver-related mortality increases exponentially with progression of liver fibrosis (Dulai, 2017).

At the same time, Western diet influences intestinal microbiome, leading to its changes, including permanent loss of the bacteria essential to its functioning. In research conducted on animals it has been proven that ingredients of Western diet lead to gut microbiota dysbiosis, encroachment, and increased proinflammatory potential, which, in turn, cause the development of intestinal inflammation, colitis, metabolic syndrome, hepatitis, as well as decreased nutrient uptake (Zinöcker & Lindseth, 2018). These phenomena lead to disorders of mucosal and systemic immune response, increased inflammatory reaction in the intestine, and increased permeability of the intestinal barrier. Furthermore, disorders of the interaction between the microbiome, nutrients, and the immune system render the organism more susceptible to infection.

Inflammatory bowel disease (IBD) consists in chronic inflammatory states in the bowel. It has a multifactor aetiology, and the main roles are played by genetic, immunological, and environmental factors. Imbalance of the homeostasis between the microbiome, nutrients, and the immune system are considered the environmental factors acting as the trigger or causing the progression of inflammatory bowel disease. It has been demonstrated that meat consumption, as well as decreased vitamin D levels and omega-6 polyunsaturated fatty acids (PUFA) all contribute to the increased risk of developing IBD (Statovci, Aguilera, MacSharry, & Melgar, 2018).

It has been demonstrated that ingredients in Western diet lead to increased probability of the development of cancer of the large intestine. It has been proven that overabundance of protein and fat in diet leads to the development of inflammatory states in the bowel. High-fat diet stimulates the change of bile acids into the cancerogenic desoxycholic acid. Decreased fibre supply, typical of Western diet, leads to microbiome imbalance and improper functioning of the mucosa of the bowel, which has a cancerogenic effect (O'Keefe, 2016). Studies carried out among semi-urbanised farmer/shepherd African populations consuming >50g of fibre daily have demonstrated that the probability of developing bowel cancer in these populations is significantly lower than in the general population. Bacterial fermentation of fibre produces short-chain fatty acids (SCFA), unavailable in diet. One of these acids is butyrate, which constitutes one of the main energy sources for koilocytes and stimulates the activity of the microflora of the bowel, demonstrating, at the same time, anticancer properties (Ocvirk, Wilson, Appolonia, Thomas, & O'Keefe, 2019).

In the population following Mediterranean diet one can observe an approach to nutrition markedly different to that of Western diet. Mediterranean diet is based on products which have been used for centuries by the inhabitants of the Mediterranean, and mainly consists in large amounts of vegetables, fruit, legumes, full-grain products, fish and seafood, moderate amounts of meat and dairy (mainly lamb), as well as olive oil, and moderate amounts of wine to

accompany meals (Gerber & Hoffman, 2015). Greater attention was placed upon Mediterranean diet in the 1960s when Ancel Keys conducted research on 15 cohorts in seven countries and demonstrated that the presence of saturated fatty acids in relation to negative balance of monounsaturated fatty acids increases morbidity. He has also proven that the cohorts using olive oil as the main fat in their diet had low morbidity (Keys, et al., 1986). Since then, numerous studies confirming the pro-health influence of Mediterranean diet have been conducted.

Foods in Mediterranean diet include antioxidant and anti-inflammatory substances, which is why this diet is considered a protective, anticancer factor. Olive oil and vegetables contain polyphenols, which act as antioxidants, decrease the proliferation of cancer cells, and protect cell membranes from metastasis. What is more, the diet is rich in carotenoids, vitamins C and E, folates, flavonoids, and omega-3 acids, which are all considered protective factors.

Antioxidant substances in the Mediterranean diet demonstrate protective influence on DNA cells and decrease the probability of the development of cancer. The main factor in the development of stomach cancer is the infection with *Helicobacter Pylori*; meanwhile, the substances which reduce oxidative stress probably also serve a protective function for the epithelium damaged by the bacteria. A combination of proper diet with healthy lifestyle and appropriate BMI, non-smoking, and reduced alcohol consumption may decrease the risk of stomach cancer (Mentella, Scaldaferrri, Ricci, Gasbarrini, & Miggiano, 2019).

There is strong evidence that colorectal cancer is linked to dietary factors. It has been demonstrated that Western diet may lead to the development of polyps of the large intestine, and it is connected with increased risk of colorectal cancer in men and women, as well as having influence on the development of rectal cancer. Cancers connected with Western diet are typically located in the distal part of the colon and the rectum. At the same time, reduced consumption of red meat and sweetened beverages with simultaneous following of a diet rich in fish demonstrates inverse correlation with the development of polyps and decreases the probability of cancer of the large intestine (Castelló, 2019; Fliss-Isakov, et al., 2018). A study carried out among the population of 10 European countries has demonstrated that following Mediterranean diet may decrease the probability of cancer of the large intestine by ca. 3-4% (Bamia, 2013).

Some research has demonstrated a positive influence of the polyphenols present in the diet on body mass and obesity reduction, which may reduce the risk of developing diseases concomitant with obesity; however, this problem calls for further investigation (Castro-Barquero, Lamuela-Raventós, Doménech, & Estruch, 2018). Increased BMI is closely correlated with fatty liver and hepatitis. It has been demonstrated that following Mediterranean diet with its high content of monounsaturated fatty acids (MUFA) and omega-3 acids has positive influence on the metabolic syndrome factors, increases sensitivity to insulin, has anti-inflammatory qualities, and reduces oxidant stress. Simultaneously, a diet based on polyunsaturated fats (PUFA) reduces fatty liver even

without body mass reduction, without influence on fibrosis and inflammation (NASH). Additionally, Mediterranean diet contains low amounts of refined sugars, which are a factor in fatty liver (Plaz Torres M. C., et al., 2019). Research on animals has demonstrated that diet rich in fibre modulates intestinal microbiome, promoting the production of short-chain fatty acids by bacteria, which lowers the level of cholesterol and triglycerides in serum and the liver, which may be beneficial to patients with NAFLD (Parnell, Raman, Rioux, & Reimer, 2011). Consumption of sufficient amounts of fibre plays a role in prophylactics and treatment of constipation and diverticulosis, and it may reduce the occurrence of reflux, ulcer disease, and diseases of the gall bladder (Ma, et al., 2019; Anderson, et al., 2009).

THE RISK OF THE DEVELOPMENT OF DISEASES OF THE DIGESTIVE SYSTEM CONNECTED WITH ALCOHOL CONSUMPTION

Apart from improper diet, also addictive substances have negative influence on the digestive system. In the article we present the impact of the most popular of them – alcohol. Alcohol is a toxic psychotropic substance negatively affecting the human organism by leading to mental disorders, diseases of the digestive system, cardiovascular diseases, and many more. What else can be included among the effects of the consumption of alcohol are the spread of infectious diseases and the increased number of the incidents of injury, accidents, and deaths. According to the 2018 WHO report (WHO, 2018) alcohol is the third most serious health risk. The adverse effects of its consumption are the cause of 3 million deaths a year (5.3% of all deaths) and 132.6 million disability adjusted life-years (DALYs). The number of deaths linked to alcohol consumption is higher than that of those caused by tuberculosis, HIV/AIDS, or diabetes. Diseases of the digestive tract caused by overconsumption of alcohol are responsible for 0.6 deaths annually, and cancers linked to ethanol consumption for 400,000 deaths a year.

According to International Statistical Classification of Diseases and Related Health Problems (ICD-10) adverse alcohol use is considered as drinking alcohol in a way which has adverse influence on health, which may be manifested somatically or mentally (WHO, 2004). Alcohol consumption is calculated on the basis of a standard dose, that is, the number of grams of pure alcohol; the number varies between 10-14g, depending on the source (*Dietary Guidelines for Americans*, 2015; Thursz, et al. 2018). No consensus has been reached as to a maximum safe daily dosage of alcohol, however, many countries define their own recommendations pertaining to daily alcohol consumption, typically in the vicinity of 20-30g of pure ethanol daily (IARD, 2019). J. Rehm defines a “heavy drinking occasion” as the consumption of 60g of pure alcohol during a single occasion, and the everyday consumption of 60g of ethanol by men and 40g by women as “chronic heavy drinking” (Rehm, et al.; 2017).

The digestive tract is the first place where alcohol comes into contact with the human organism; furthermore, it is the main place where alcohol is metabolised and, as a result, its exposure to the metabolites of alcohol is also the highest. Consumption of ethanol has negative effect on intestines, leading to disfunctions of the intestinal barrier, facilitating endotoxemia, chronic inflammatory condition, and intestinal dysbiosis (Patel, et al., 2015). The main organ responsible for alcohol metabolism is the liver. Regular daily consumption of >20 g of alcohol for women and >30g of alcohol for men leads to alcohol liver disease (ALD). ALD develops as fatty liver, hepatitis, or liver cirrhosis. Alcohol-associated liver disease (AALD) is considered the most common liver disease in the world, in particular in industrialised and Eastern countries (Asrani, Devarbhav, Eaton, & Kamath, 2018). Overconsumption of alcohol leads to fatty liver, hepatitis, cirrhosis, and hepatocellular carcinoma. Research has demonstrated that 10-35% of heavy drinkers will develop liver cirrhosis (Gao & Bataller, 2011). Initially ALD has no symptoms, however, with the progression of histologic changes the risk of hepatic and extrahepatic complications increases (portal hypertension, varices of the oesophagus and/or rectum, hepatic encephalopathy, abdominal dropsy, spontaneous bacterial peritonitis, haemorrhagic diathesis, hepatorenal syndrome, hepatopulmonary syndrome). It is estimated that AALD is responsible for 36% of liver-related deaths (Haflidadottir, et al., 2014). Morgan has estimated that daily consumption of >80g of ethanol for 10 years is linked to a five-fold increase risk of hepatocellular carcinoma, and in the case of decompensated alcoholic liver cirrhosis the risk amounts to 1% annually. HCC may also develop in younger individuals and be more advanced when a patient's AALD is combined with hepatitis C (Morgan, Mandayam, & Jamal, 2004).

Alcohol is the main factor in severe chronic pancreatitis. At the same time, the combined inflammatory conditions constitute the third most common cause of admission to gastroenterological hospital wards in the USA (Peery, et al., 2018). Severe pancreatitis is an inflammatory process caused by premature activation of proteolytic enzymes. It is typically caused by cholelithiasis (30-50%) and alcohol (30-50%). It is estimated that consumption of 50-80g of alcohol is a factor destructive to the pancreas. Not all individuals who abuse alcohol develop pancreatitis, which is why a hypothesis has been formulated that ethanol is a co-factor in pancreatitis, because it increases the sensitivity of the pancreas to other factors causing severe inflammation, that is, dietary mistakes (diet with high lipid content), inflammatory factors, or nicotine smoke (Weiss, Laemmerhirt, & Lerch, 2019). Chronic pancreatitis is a multi-factor process leading to substitution of normal tissues of the pancreas with fibrous tissue and, as a result, impairment of the endocrine and exocrine functions of the organ. It has been demonstrated that chronic pancreatitis develops in only 3-5% individuals consuming 5 units of alcohol per day (Pham & Forsmark, 2018). David C. Whitcomb and co-authors have demonstrated that the CLDN2 gene predisposes towards the development alcohol-induced pancreatitis (Whitcomb, et al., 2012).

Alcohol consumption is considered a factor in the development of cancers. Research has demonstrated the influence of alcohol on the development

of cancer of the oropharynx, larynx, oesophagus, liver, colon, and rectum, as well as breast cancer. In the pathogenesis of cancers of the digestive tract a role is played by the products of alcohol metabolism such as acetaldehyde and acetic acid, which lead to cancerogenic processes, that is, DNA damage, creation of reactive oxygen species, and development of oxidative stress, leading to genetic instability. A further factor influencing cancer development are nutrient deficiencies, common in alcohol consumers (Vanella, Archibugi, Stigliano, & Capurso, 2019). Also the amount of consumed alcohol is considered one of the factors in the development of cancers. According to World Cancer Research Fund daily alcohol consumption in doses of over 30g increases the probability of developing cancer of the large intestine, and above the dose of 45g the probability of the development of stomach and liver cancer rises (*World Cancer Research Fund International*, 2018). Even small amounts of ethanol may influence the cancerogenic process, which has been assessed in a metanalysis, in which it has been demonstrated that daily alcohol consumption of 15g increases the probability of developing colorectal cancer; it does not, however, influence the development of oesophagus, stomach, pancreas, and liver cancer. Daily alcohol consumption of 15-30g increases the probability of developing squamous cell carcinoma of the oesophagus and colorectal cancer, and it is linked to higher morbidity among colorectal cancer patients. Consuming >30g of pure ethanol daily does not, however, influence the development of adenocarcinoma of the oesophagus, pancreas, and stomach, and its influence on the development of cancers of the colon is marginal (Choi, Myung, & Lee, 2018). Another study has demonstrated, in turn, that in colon cancer patients with daily alcohol consumption of >30g in family history the risk of developing colorectal cancer is higher than in persons without alcohol consumption in family history (Cho, Lee, Rimm, Fuchs, & Giovannucci, 2012). It has also been demonstrated that regular alcohol consumption at least once a week for 6 months in obese individuals with BMI>30 is linked to increased probability of developing colorectal cancer in comparison with a group with lower BMI (Zhao J., et al., 2012). It ought also to be noted that there is no correlation between the type of alcohol consumed and developing colorectal cancer (Bongaerts, van den Brandt, Goldbohm, de Goeij, & Weijnenberg, 2008).

INFLUENCE OF STRESSOGENIC FACTORS ON DISEASES OF THE DIGESTIVE SYSTEM

The first scientific theories regarding stress were formulated at the beginning of the 20th century. Hans Selye is considered the 'father of stress research.' He has defined stress as "the non-specific response of the body to any demand upon it" (Selye, 1956). According to the author stress is the result of changes in the endocrine and nervous system, and stress reaction can be divided into three stages: alarm reaction, stage of resistance, and stage of exhaustion. It ought to be noted that strong and chronic stress is the most destructive. H.

Selye (1956) stated that stress can be positive by motivating one to act (eustress), as opposed to distress, which is destructive to the organism and makes it difficult to achieve one's goals. Numerous studies on the influence of short- and long-term stress on the functioning of the human body, including the digestive tract, are currently being conducted. One of the most common conditions which can be catalysed by stress is the Irritable Bowel Syndrome. IBS is one of the most common reasons for appointments with General Practitioners and gastroenterologists and it pertains to 10-15% of the European generation. IBS is a chronic, functional disease of the small and large intestine (Quigley, et al., 2016). In the pathogenesis of IBS infection, immunological activation, decreased or increased activity of serotonergic receptors in the digestive tract, small intestinal bacterial overgrowth (SIBO), genetic factors, as well as impairments on the gut-brain axis are assumed to play a role (Saha, 2014). Research has demonstrated that stress is a factor influencing the activation of the corticotropin-releasing factor (CRF) of the system, which affects the hypothalamic-pituitary-adrenal axis. Activation of the peripheral and/or central CRF receptors may be responsible for the diarrhoea and hyperalgesia in IBS. Furthermore, it has been demonstrated that IBS may be based on excessive excitability of the sympathetic nervous system at rest or a dysfunction of the autonomous nervous system with maladjusted response to stressors. What is more, stress causes impaired function of intestinal barrier, increasing its permeability (also for antigens) and leading to intestinal hypersensitivity (Pellissier & Bonaz, 2017). Acting on the neural, endocrine, and immunological paths stress may influence intestinal microbiome, leading to its permanent changes. Changes in the intestinal microbiome affect the gut-brain axis. Furthermore, animal studies have demonstrated that impairments of the intestinal microbiome may lead to intestinal hypersensitivity, as well as immunological and neurological impairments (Moloney, et al., 2016; Molina-Torres, Rodriguez-Arrastia, Roman, Sanchez-Labraca & Cardona, 2019).

Inflammatory bowel disease (IBD) is a combination of chronic conditions, and patients suffering from it are observed to develop depression, anxiety, and obsessive-compulsive disorder more frequently than the general population. The connection between the intensity of symptoms of the disease and stress is bidirectional. Intensification of the disease leads to elevated levels of experienced stress in comparison with a group of asymptomatic patients. At the same time, stress leads to intensification of symptoms. Stress is also discussed as one of the factors influencing the appearance of the disease. A number of bidirectional paths are mentioned in reference sources. The paths may be activated or modulated by stress (among others, autonomous nervous system, sympathetic nervous system, hypothalamic-pituitary-adrenal axis) influencing the immune system and intestinal microbiome (Labanski, Langhorst, Engler, & Elsenbruch, 2019). It has been demonstrated that stress level leads to impairment of the barrier of intestinal epithelium, facilitating the translocation of bacteria and toxins from the intestine to the bloodstream, which affects the immune system and induces immune response (Bernstein, 2017).

It has been demonstrated that stress, depression, and anxiety influence illnesses of the upper digestive tract; they lead to, among others, dyspepsia and reflux. Dyspepsia is one of the most common disfunctions of the digestive tract and afflicts ca. 20% of the general population (Moayyedi, et al., 2017). It manifests itself by pain in the upper abdomen lasting over a month, possibly accompanied by a feeling of fullness after meals, early feeling of satiety, nausea, and vomiting. Diagnosis of dyspepsia can be made after the existence of an organic disease causing the symptoms is excluded. In the research conducted by Lee it has been demonstrated that stress and depression constitute factors predisposing to dyspepsia, and what is more, depression is an independent factor in the case of gastric adenoma/carcinoma (Lee, et al., 2015).

Ailments of the digestive system caused by stress are troublesome and they impair patients' everyday lives. For example, intensification of the symptoms of reflux is correlated with stress (Song, Jung, & Jung, 2013). The level of anxiety of patients with reflux leads to intensified heartburn and retrosternal pain, and decreases their quality of life (Kessing, Bredenoord, Saleh, & Smout, 2015).

PHYSICAL ACTIVITY IN THE PRESERVATION OF DISEASES OF THE DIGESTIVE SYSTEM

The understanding of human health as mental, physical, and emotional wellbeing involves patients in disease prevention and motivates them to actively look after and enrich their own health resources (WHO, 2020). In the case of preventing ailments of the digestive system one ought not only to abstain from unhealthy products, alcohol, nicotine, etc., but also to take care to be moderately to intensely physically active according to a training plan adjusted to an individual's abilities and fitness. Physical activity reinforces the positive influence of a healthy diet on an individual's BMI as well as reducing stress. It has been demonstrated that morbidity linked to generally limiting causes, the metabolic syndrome and its constituents, brain stroke, depression, as well as breast and colon cancer is lower among individuals who do sport regularly. WHO recommends at least 150 minutes of moderate-intensity and 75 minutes high-intensity aerobic activity per week.

Sedentary lifestyle often leads to overweight and obesity, which constitute risk factors in colorectal cancer. It has been estimated that lack of regular physical activity leads to 12-14% of the instances of colorectal cancer. Proper amount of physical activity reduces obesity, increases intestinal motility, strengthens the immune system, and reduces the number of free radicals, thus reducing the probability of developing colorectal cancer. The exact amount of movement sufficient to play a protective role has not been determined, but it is probable that protective qualities appear with 3.5-4 hours of intensive activity per week (Slattery, 2004). One of the studies has also demonstrated that physical activity of men is connected with reduced risk of developing advanced cancerous polyps (Wallace, et al., 2005).

It is assumed that sedentary lifestyle may play a potential role in the development of, or predisposition towards, developing NAFLD. Patients with fatty liver diagnosis, in turn, may experience positive results from modification of their lives, including increasing the amount of movement and changing their lifestyles from sedentary to active (Romero-Gómez, Zelber-Sagi, & Trenell, 2017).

It is also probable that a connection exists between physical activity and disfunctions of the digestive tract. It has been demonstrated that sufficient amount of movement reduces gastrointestinal symptoms in patients with IBS.

The influence of physical activity on gastrointestinal reflux is also frequently discussed. One of the studies has demonstrated that increasing physical activity may lead to decreased risk of GERD in patients with obesity. However, no correlation has been observed between GERD symptoms and the activity of individuals without obesity (Djärv, et al., 2012).

SUMMARY

Diseases of the digestive system are one of the most common reasons why people seek medical help. The causes of numerous of these states lie in the patients' lifestyles. Pro-health behaviours, and avoiding behaviours destructive to health, may play an important role in the prophylactics and treatment of many diseases of the digestive system.

In research on healthy lifestyle particular emphasis is placed on diet. Among the two most popular types of diet, the Western diet and the Mediterranean diet are discussed. Western diet is linked to development of obesity, fatty liver, and colorectal cancer. The substances found in Western diet may trigger inflammatory bowel disease (IBD). Mediterranean diet is considered to have protective qualities in relation to the development of colorectal cancer. High fibre content plays a prophylactic and therapeutic role in some diseases of the digestive tract.

Abstaining from alcohol and other drugs constitutes yet another pro-health behaviour. Alcohol, one of the most popular psychoactive substances, has particularly powerful influence on the liver, leading to fatty liver, hepatitis, fibrosis, cirrhosis, hepatocellular carcinoma, and resulting complications. Excessive alcohol consumption is considered a factor in the development of cancers of the digestive tract, that is, oesophagus, liver, colon, and rectum cancer.

Stressogenic factors may be caused by life events, but they can also depend on the lifestyle. Stress has significant influence on disfunctions of the digestive tract, in particular on the development of irritable bowel syndrome and dyspepsia. Stress is also closely linked to inflammatory bowel disease (IBD).

One of the most effective health behaviours, with a holistic influence on the organism, is physical activity. Sufficient amount of physical activity is considered one of the factors protecting against colorectal cancer. Doing sport is considered one of the crucial changes in the lifestyle of patients with fatty liver, and it may constitute a factor reducing the symptoms of IBS.

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