

Characteristics of the nutritional status of the elderly and senile age with alimentary-dependent diseases

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Abstract

Aging is not a disease, it is a physiological process of vital activity of the body as a result of which changes in functional and adaptation balance occur, that is, deviations in terms of health and are mainly the result of changes in cell structure and changes in biochemical and metabolic functions, as well as the prevalence of chronic diseases. One of the significant environmental factors that have a direct impact on the health and life expectancy of older people is rational and complete nutrition. Rational and balanced nutrition in the elderly and senile age affects the development of aging and the characteristic functional abnormalities in the organs and systems of the body. Nutrition in the elderly and senile is expressed by an imbalance of nutrients in the diet, such as protein, vitamins and minerals, which, in turn, can cause alimentary-related diseases. Preventing diseases and increasing life expectancy should be for every individual a credo in life — that is, common rules in life, such as playing sports, defeating stress, eating quality food and drinking water, preventing the appearance and development of diseases

Key words: aging, balanced diet, life expectancy, gerontology, nutrients, proper diet

Rational and balanced nutrition in the elderly and senile age affects the development of aging and the characteristic functional abnormalities in the organs and systems of the body. Nutrition in elderly and senile people is expressed by an imbalance of nutrients in the diet, such as protein, vitamins and minerals, which, in turn, can cause nutritional-related diseases. The prevention of diseases and the pursuit of longevity should be for every individual a credo in life — that is, common rules in life, such as playing sports, defeating stress, eating quality foods and drinking water, preventing the emergence and development of diseases [1]. With age, a person has a lot of deviations in terms of health. If we take the statistics of the incidence of elderly and senile age, then it increases several times in contrast to the incidence of young and mature people.

Therefore, the older age group is required to provide the medical care they need. In this regard, gerontology is very relevant [2]. It is a science that studies the aging of a person, considering this process in the biological, psychological, social and medical areas. The issues of clinical manifestations, diagnosis, prevention and

treatment of diseases in the elderly and old people are studying geriatrics - as an independent part in the field of gerontology. Leading in the direction of studying the questions of medicine in gerontology is getting answers to find the most effective methods of slowing down aging, wear, and preventing early aging. But in order to solve such problems, one must take into account the influence of the external environment, which can have both a positive and a negative effect on the human body [3]. This is a doctrine that studies the aging of a person, considering this process in the biological, psychological, social and medical areas. The essence of symptoms, diagnosis, prevention and treatment of diseases in the elderly and old people are studying geriatrics - as an independent part in the field of gerontology. The main aspect of the study the questions of medicine in gerontology is getting answers to find the most effective methods of slowing down aging, wear, and preventing early aging. But in order to solve such problems, one must take into account the influence of the external environment, which can have both a positive and a negative effect on the human body [4]. It is a discipline that studies the aging of a person,

considering this process in the biological, psychological, social and medical areas. The picture of pathological manifestations, diagnosis, prevention and treatment of diseases in the elderly and old people are studying geriatrics - as an independent part in the field of gerontology. The key orientation of the study the questions of medicine in gerontology is getting answers to find the most effective methods of slowing down aging, wear, and preventing early aging. But in order to solve such problems, one must take into account the influence of the external environment, which can have both a positive and a negative effect on the human body [5]. Currently, studies have found that 95% of genes can be expressed by environmental factors, such as nutritional factors, that is, the fight against vitamin D deficiency, reduced consumption of simple carbohydrates, the prevalence in the diets of natural antioxidants, vitamins of groups A, B, C, E, macro and microelements (iron, iodine, zinc, etc.), saturated and unsaturated fatty acids. Influencing these nutrients, one can achieve genetic balance in the cells, influence on the processes of physiological aging, in the direction of slowing down, as well as on the emergence and development of age-related diseases [6]. Thus, food rations of elderly and senile age should be adjusted to prevent violations of the nutritional and nutritional status, to prevent the development of nutritional-dependent diseases, as well as for their prevention [7]. With aging, a person has many biological and metabolic changes at both the pathological and functional levels.

Aging is not a disease, it is mainly the result of changes in the cellular structure and changes in biochemical and metabolic functions. The result of aging, even healthy aging, is increased susceptibility to disease and an increased likelihood of the end point of aging and death. Our life expectancy is affected by our genetics and our environmental impact, and our death is usually explained by the failure of the critical organ system (cardiovascular, renal, pulmonary, etc.). Theories of aging can be divided into two main categories: biological and chemical. Biological theories view aging as a genetically controlled event defined by a programmed expression or suppression of genetic information. Apoptosis (programmed cell death) is an example of genetically programmed events at the level of cells and organs [8]. Long-lived species have more efficient DNA repair processes. Chemical theories of aging are the result of cumulative errors in the mechanisms of replication, repair, transcription, and translation of genetic information. Ultimately, errors in critical enzymes, such as DNA and RNA polymerases or enzymes involved in the synthesis and turnover of proteins, gradually affect the accuracy of the expression of genetic information and allow accumulated proteins to accumulate. The most widely accepted chemical theory of aging is the free radical theory of aging (FRTA). This considers aging as the result of cumulative oxidative damage to biomolecules: DNA, RNA, protein, lipids and glycoconjugates [9].

Lipofuscin is the name of fine-grained yellow-brown pigment granules consisting of lipid-containing lysosomal digestion residues. It is considered one of the aging, found in the liver, kidneys, heart muscle, retina, adrenal glands, nerve cells and ganglion cells. Pathological accumulation of lipofuscin is associated with Alzheimer's disease, Parkinson's disease, lysosomal diseases, acromegaly, etc. [10]. Antioxidant supplements (vitamin, etc.) affect the maximum lifespan of humans or other vertebrates. Enzymes, such as superoxide dismutase and glutathione peroxidase, are induced in response to oxidative stress and can also be suppressed during low oxidative stress. Thus, the body can respond to maintaining a

homeostatic balance between prooxidant and antioxidant forces [11]. Aging is associated with a decrease in bone mass and the accumulation of bone marrow adipocytes. Both bone-forming osteoblastic cells and bone marrow adipocytes originate from a stem cell population in the bone marrow stroma, called stromal (skeletal or mesenchymal) stem cells (BMSC). Physiological processes of aging, cause changes in the distribution of BMSC clones and enhance the differentiation of adipocytes and defective osteoblasts, which leads to a gradual depletion of the regenerative potential of stem cells and defects in bone and tissue homeostasis and metabolism. With the age of bone marrow obesity and counteracting the overall negative effect of aging on bone tissue in order to reduce bone fragility and the risk of fractures [12]. Accelerated aging and the aging process in the brain. One of the approaches to the study. The problem of aging is the study of genetic pathologies leading to accelerated aging, such as Hutchinson-Gilford progeria syndrome, Werner syndrome and Down syndrome. Probably, this approach can be used when trying to understand the neuronal mechanisms that underlie normal and pathological brain aging. Analysis and current state of scientific knowledge about these pathologies shows that in Hutchinson-Gilford and Werner Syndrome, the rate of brain aging is much lower than the rate of aging of the whole body, whereas in Down syndrome, the brain ages faster than other organs due to the accumulation beta amyloid and chronic oxidative stress in brain tissue [13]. The essence of the previously proposed hypothesis is that the aging of higher animals and humans is associated with an increased level of reactive oxygen in mitochondria with age, which activates apoptosis, thereby reducing the number of functioning cells [14].

Aging affects all organs of the human body; nevertheless, brain aging should be distinguished from aging of all other organs, because for most neurons, like postmitotic cells, their lifespan begins at birth and is equivalent to the lifespan of the whole organism. Although, according to modern knowledge, without significant loss of neurons, it is found during normal aging [15,16].

Preventing diseases and increasing life expectancy should be for every individual a credo in life — that is, common rules in life, such as playing sports, defeating stress, eating high-quality food and drinking water, preventing the emergence and development of diseases [17,18]. Scientists have conducted a study on older people, changing their usual lifestyle to an active (physical exercise) and improving their diets in the direction of balanced and rational, the respondents 45-64 years old in the amount of 15700 people for 10 years received the following results - 970 studied persons having changed Lifestyle (regular exercise, proper diet with a predominance of fruit and vegetable consumption, avoiding bad habits, weight loss) affected mortality (decreased by 40%) and the frequency of cardiovascular diseases (decreased by 35%) compared with those who remained with an unhealthy lifestyle (reduced motivation for life) [19,20]. The aging process is always accompanied by a gradual decrease in the physiological functions of tissues and organs. In the late phase, aging is accompanied by some degenerative diseases and mortality [21,22]. The aging liver has some age-related changes, such as decreased volume and hepatic blood flow. In aging people, the liver has a brownish appearance, which is usually due to the accumulation of lipofuscin in the liver cells during aging. The vitality of the liver cells is reduced due to an excessive amount of reactive oxygen species (ROS) caused by lipofuscin. Liver cells are composed of hepatocytes and non-hepatocytes, and non-hepatocytes include endothelial cells, Kupffer cells,

lymphocytes, stellate cells, and bile cells. As a site of immune maturation and differentiation, liver aging involves some immune related changes [23,24]. There were several immune cells, such as macrophages, natural killer cells, T-cells, B-cells and neutrophils, which were collected in the liver tissue of old mice. Inflammatory cytokines and chemokines also increase in the elderly liver, which causes inflammation and is associated with foreign antigens in the liver [25,26]. In addition, it was also shown that an increase in the number of natural killer cells and macrophages in the elderly liver produced more gamma-interferon, which impaired the ability of the liver to regenerate.

The aging process of the liver is associated with a decrease in the immune response compared with the young liver, which makes the aging liver more susceptible to infections, malignant neoplasms and autoimmunity [27,28]. During the aging process, mitochondrial dysfunction is induced by a disturbance in the electronic conversion process, which leads to a decrease in the production of adenosine triphosphate (ATP) and an increase in oxidation products, such as phospholipids, proteins and DNA. ROS are by-products of oxidative phosphorylation in mitochondria. As a result, aging severely impairs the antioxidant capacity of normal cells, and its ROS products cause oxidative stress, damage mitochondrial DNA, and can eventually lead to DNA mutations [29,30]. One of the significant environmental factors that have a direct impact on the health and life expectancy of older people is rational and complete nutrition. All age groups of the population should rely on the general rational nutrition system; in old age, an adapted diet requires some revision. Due to its nature, physiological changes lead to a decrease in the activity of the main metabolism in the body. Because of this, nutritionists recommend a gradual reduction in the caloric content of the daily diet. In the older age group mainly chronic diseases occur, namely cardiovascular pathology, cerebrovascular changes, disorders of the musculoskeletal system, cerebral circulation, cancer. In order to influence chronic processes, it is necessary to lead a healthy lifestyle and abide by a healthy diet, which in turn will be beneficial for the organism as a whole [31,32].

When studying the concepts of gerontology, it is necessary to consider the principles of nutrition as an integral part of the health of an elderly person. To do this, it is important to know that the energy value of the diet should be combined with the actual energy consumption of the body, that the precautionary pursuit of diets allows for the prevention or hindering the development of cardiovascular diseases, alimentary-dependent diseases, oncology and other diseases inherent in old age. It is also important to focus on the nutrition of the elderly and old people, taking into account the specificity of the metabolism and the functionality of organs and systems, their own eating habits [33,34].

Aging of the body leads to a decrease in the intensity of metabolic reactions of the body, and this in turn leads to a change in basal metabolism, a decrease in oxygen production and carbon dioxide release from the body, a slowdown in protein metabolism, an increase in the amount of lipids in tissues, a decrease in the activity of enzymes of redox reactions in the liver, heart, muscles, kidneys. It follows that human nutrition plays an important role in maintaining the normal functioning of the body. Rational and balanced nutrition in the elderly and senile age affects the development of aging and the characteristic functional abnormalities in the organs and systems of the body. The body's need for energy [35,36].

A fixed lifestyle, smoking and alcohol, stressful effects, and of course chronic diseases have a detrimental effect on the health of older people and, thus, trigger the mechanism of premature aging. It is important that an unbalanced and unhealthy diet that violates both nutritional and nutritional status (the effect of nutrition on the human body) triggers the development of alimentary-dependent diseases, such as obesity, type 2 diabetes, metabolic syndrome, anemia, hypertension, etc. [37,38]. In order to study the problems of healthy nutrition of older people, it is necessary to take into account the fact that the rations of the elderly have an inadequate content of vitamins and minerals, micro and macronutrients, due to significant consumption of carbohydrate foods (mono- and disaccharides) and low food intake vegetable production (vegetables and fruits). Older people are recommended to limit the energy value of the diet, the consumption of carbohydrates - sugar and confectionery and animal fats. Knowing that fats are sources of some natural anti-sclerotic factors, and an insufficient amount of fat in the diet interferes with the work of fat-soluble vitamins (retinol, calciferol, tocopherol and phyllochinone). Anti-sclerotic ability has lecithin present in egg yolk, liver; choline contained in eggs, meat, fish, beans, cabbage; inositol found in oranges, green peas and melon. The blood serum cholesterol content also reduces folic acid in green leafy vegetables, cauliflower, potatoes, beets, chicken meat, and liver. In the diets of older people should be antioxidant vitamins (vitamins E and C), which affect the processes of lipid peroxidation and liver obesity. To improve the intestinal microflora in the elderly, it is more prudent to use dairy products (yogurt, kefir, acidophilus) and use products with dietary fiber (pectic substances) in the diet. It is believed that the rational use of four meals a day with the following order of its conduct during the day: first breakfast - 25%, second breakfast - 15%, lunch - 35% and dinner 25%. And in the diet for older people, the ratio of proteins, fats and carbohydrates should be 1: 1.1: 4.9 for men and 1: 1.1: 4.7 for women [39,40]. Insufficient intake food in the elderly increases the vulnerability of the immunological system, the risk of infections, and also leads to muscle atrophy, high levels of sugar and fat in the plasma, fatigue, apathy, a greater risk of bone fractures and a decrease in response to medication. The physiological and pathological changes associated with aging lead to changes in eating habits and the use of nutrients by the body. According to a number of researchers, it is the nutrition in elderly and senile people that is expressed by an imbalance of nutrients in the diet, such as protein, vitamins and minerals, which, in turn, can cause alimentary-dependent diseases (cardiovascular, endocrine, blood and gastrointestinal tract, oncological, etc.), in accordance with ICD-10 (International Classification of Diseases of the 10th revision). In addition, irrational and malnutrition activates the mechanisms of premature aging, which subsequently lead to disability and mortality. Therefore, nutrition in older age groups should be balanced and complete, affecting active longevity, as the standard of living for a modern state and being a pressing issue for our country.

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