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Review Article

Nutritional Approaches in Geriatric Period

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Abstract

The concepts of "old age" and "aging" are concepts that are frequently used in the fields of gerontology and geriatrics and are often confused with each other. Aging is a process with biological, chronological and social aspects that cannot be prevented. Aging is seen in all living things and is a natural and inevitable period of life such as childhood, youth and adulthood. The elderly population increases by about 5% per year in developed and developing countries. There is an increase in life expectancy after birth with a decrease in mortality and fertility; While the proportion of children and young people in the population is decreasing, the percentage of the elderly is increasing. Today, the highest number of elderly people live in China with 106 million. As we age, there are significant changes in bodily functions. These changes affect the individual's daily life, working life, addiction status and communication with the environment. It is important to understand whether the changes that occur in elderly individuals are pathological or not, to distinguish between changes due to aging and changes due to chronic diseases, in order to prevent erroneous diagnoses, unnecessary tests and treatments. Adequate and balanced nutrition in old age is important in terms of increasing the quality of life. During this period, nutrients are consumed insufficiently and the rate of use of nutrients in the body is lower. Therefore, many elderly people may suffer from micronutrient deficiencies. The purpose of elderly nutrition; intake of macro (carbohydrate, protein, fat) and micro (vitamin, mineral) nutrients needed daily, meeting the necessary fluid needs, preventing the formation of chronic diseases, protecting, improving and developing health. In the diets of the elderly; energy and macro-micronutrient requirements, nutritional habits, diseases, lifestyles, physical activity levels and drugs they use should also be taken into consideration. The aim of this review is to reveal the nutrition style that should be applied in elderly individuals according to current approaches.

Keywords: Aging; Chronic Diseases; Elderly People; Nutrition; Macro-Micronutrients

Abbreviations

WHO: World Health Organization; MNA: Mini Nutritional Assessment; SGA: Subjective Global Research; MUST: Subjective Global Research; GNRI: Geriatric Nutritional Risk Index; NRS: Nutritional Risk Screening; CHO: Carbohydrate; LDL: Low-Density Lipoprotein

Introduction

"Old age'" is defined as the state in which morphological, physiological and pathological changes begin to progress negatively, various diseases appear, there is a decrease in physical and mental skills, showing the effect of age that has increased and continues to increase [1]. "Aging" is an irreversible inevitable process that begins in the intrauterine period in all living beings and continues until death, and during this time it changes in many ways and affects life. According to the World Health Organization (WHO), individuals aged 65 and older are classified as "elderly [2]. According to the progression of old age and the observed changes in body functions, old age is classified as 'late adulthood' between the ages of 65 and 74, 'old age' between the ages of 75 and 84, and 'advanced old age' between the ages of 85 and older. The aim of this study is the nutritional approaches of the individual in the geriatric period were compiled in the light of the current literature.

Epidemiology of old age

The aging of the population is defined as the changing age distribution of the population in any country, the decrease in the proportion of children and young people in that population and the increase in the proportion of people in the elderly group [3]. Today, the most elderly people live in China with 106 million.

Changes observed during old age

The physiological changes observed in aging occur at different rates in all elderly people with aging, physiological changes occur in the musculoskeletal system, cardiovascular system, gastrointestinal system and many other system and in the senses [4].

Evaluation of nutritional status in old age

Many methods are used to assess the nutritional status; however, none of them alone is sufficient. Nutritional status in the elderly is evaluated by determining nutrient intake, physical examination, anthropometric measurements, laboratory tests, body composition and screening tests. In determining the nutrient intake of an individual; 24-hour nutrient consumption, determination of nutrient consumption frequency and observation of nutrient intake methods are used [5]. However, there are plus or minus aspects of each method used. Anthropometric measurements are a non-invasive nutritional status assessment method that provides information or includes estimates related to body composition, fat and muscle reserves [6]. In the elderly; body weight, height length, upper middle arm circumference, calf circumference and skin fold thickness are the most commonly used methods in anthropometric measurements [5]. Laboratory tests (biochemical – hematological, biophysical- functional tests) are used to determine the nutritional status. From biochemical parameters, blood proteins, blood fats, hemoglobin and hematocrit levels, vitamin and mineral levels in blood and urine determine the nutritional status in terms of anemia [5,7].

Functional abilities or structural disorders in tissues are detected by biophysical tests. Nutritional screening is a process used to identify individuals who are at risk of malnutrition and need further nutritional assessment and intervention [8]. Some of the nutrition screening tools have been developed primarily just to detect malnutrition, while others have been developed as prognostic tools in clinical outcomes and healthcare [9]. An effective screening tool has practical, effective, fast-yielding, consistent, economical features that can be easily applied by a trained health professional and should include specific positive/negative estimates [7]. Decently used screening tools for the evaluation of nutritional status include Mini Nutritional Assessment (MNA), Malnutrition Universal Screening Tool (MUST), Subjective Global Research (SGA), Nutritional Risk Score - Nutritional Risk Screening (NRS-2002) and Geriatric Nutritional Risk Index-Geriatric Nutritional Risk Index (GNRI). However, none of these screening tools have been accepted as the gold standard.

Energy and nutrient requirements in old age

The most obvious change in nutrition for the elderly is a decrease in energy requirements [10]. A decrease in the basal metabolic rate, stagnation of physical movements and slowing down of muscle movements reduce energy expenditure [2]. Basal metabolic rate (BMR) is one of the most important components of energy expenditure [11]. It has been found that the basal metabolic rate of a 70-year-old individual is about 9-12% lower than that of 18-30 year old individuals [2]. After the age of 40, there is a 2-3% decrease in lean mass every 10 year period . A decrease in physical activity due to the fact that a large part of elderly people live a sedentary life is another reason for a decrease in energy requirements [11]. It is recommended that the elderly consume 30-35 kcal/day of energy per kilogram of their body weight, considering that they do light physical activity [12]. This value is considered to be about 1900 kcal in women and 2300 kcal in men on a daily basis.

Macronutrient

Carbohydrate (CHO)

The ability to metabolize glucose decreases with age [13]. For this reason, it is recommended by experts that 55-60% of the daily energy intake should be provided from carbohydrates and should not be taken under 130 grams [2,14]. Carbohydrates are found in simple sugars or complex structures in the composition of food [13]. Since carbohydrate tolerance decreases with advanced age, it is important to provide carbohydrates from complex sources (cereals, nuts, etc.) [2]. Thus, along with carbohydrates, the body is also provided with the intake of vitamins, minerals and pulp. Pulp, a type of carbohydrate, is known as the indigestible part of plant foods in the body [11,13]. Fruits, nuts, rice, oats, etc. the "water-soluble pulp" contained in its products contributes to the regulation of cholesterol and blood glucose levels [11]. The "water-insoluble pulp" found in cereals in breads made from wheat, corn bran, whole wheat flour helps to prevent constipation by regulating bowel movements. In the elderly, a daily intake of 21 grams of pulp is recommended for women and 29 grams for men [2]. However, attention should be paid to daily amounts, as foods with a high pulp content can reduce the absorption of energy, fats, proteins and minerals.

Protein

As in every stage of life, protein is a very important nutritional element in the diet of the elderly [12]. It is recommended that 10-15% of the daily energy intake should come from proteins or that 0.8-1 grams of protein should be given per kg and should not be lowered below 0.75 g/kg [2]. Protein intake is provided from 2 different sources, animal and vegetable [11]. The bioavailability of animal-derived protein is greater. However, since the fat and cholesterol amounts of animal protein-rich foods are also higher, it should be remembered that total fat consumption will also increase if the majority of protein is met from animal-derived foods.

Fat

Fat, as well as providing energy, is one of the nutrients that are important in the nutrition of the elderly so that fatty acids and fat-

soluble vitamins can be taken into the body [10]. It is recommended that no more than 30% of the daily energy intake should be met from fats for elderly individuals [11]. Saturated and polyunsaturated fats, which make up the composition of fat, should be less than 8-10% of the energy, while monounsaturated fats should be up to 15% of the energy. [2] The cholesterol content taken with a diet should not exceed 300 mg per day [13]. In elderly people with high low-density lipoprotein (LDL) cholesterol levels, diabetes and/or cardiovascular diseases, it should be kept below 200 mg.

Micronutrients

Due to decreased nutrient intake and low food diversity in elderly individuals, there is often a deficiency in micronutrients [2]. Micronutrients are important for maintaining body resistance and strengthening the immune system [12]. In elderly individuals, there is a greater risk of vitamin A toxicity than vitamin A deficiency, as they may not have the ability to clear retinyl esters from the liver at a sufficient speed with an increase in fat storage [13]. Therefore, caution should be taken in nutritional supplements containing vitamin A [10]. Vitamin D deficiency is observed in elderly people due to decreased synthesis of vitamin D in the skin (7-dehydrocholesterol), inability of the kidneys to convert vitamin D into the active form and inability to benefit from sunlight [13]. 10% of vitamin D deficiency is covered by nutrients and the rest is synthesized on the skin with the help of sunlight [12]. Therefore, they should benefit more from the sun along with nutritional supplements enriched with vitamin D [10,11]. In elderly people, vitamin B12, B6 and folate content of foods high in insufficient amounts are not taken and due to the presence of diseases such as atrophic gastritis that prevent the absorption of these vitamins, their requirements are higher than other B group vitamins [2,10,11]. Calcium is one of the essential nutrients involved in maintaining bone health in old age, as well as in all periods of life [11,12]. Calcium-rich nutrients are taken into the body in insufficient amounts, and their absorption in the gastrointestinal tract decreases with age [2]. The risk of developing anemia increases in the elderly due to insufficient dietary intake of iron, decreased gastric acid secretion, and decreased iron absorption [11,14].

There are two different forms of iron, "heme" and "non-heme' [15]. The bioavailability of "heme" iron, which is of animal origin, is higher, but it should be remembered that the consumption of saturated fat and cholesterol also increases if consumed in excess [11]. "Non-heme" iron, which is of vegetable origin, is absorbed more slowly in the body [2,11]. Iron requirement decreases after menopause in women, with the cessation of menstruation, and taking the recommended daily amount for men will be sufficient for women.

Fluid Requirement

In elderly individuals, many causes affect fluid intake, such as thinning of the skin layer, decreased ability of the kidney to concentrate urine, and loss of thirst [2]**.** A liquid intake of 30 mL (about 2 liters) per kg is recommended to meet the daily fluid requirement [10]. Factors such as physical activity, illness status and environmental temperature can affect the fluid requirement.

Physical activity in old age

Physical activity is necessary for the maintenance of health and a quality life in elderly people [16]. Physical activity prolongs life expectancy in the elderly, protects against the development of cancer and chronic diseases, reduces the risk of falls and fractures [17]. The physical activities usually recommended for older people are walking, swimming and cycling [18].

Conclusion

Adequate and balanced nutrition in the elderly is important for the protection, improvement and development of health, prolongation of life expectancy and improvement of quality. A variety of nutrients should be provided, as each nutrient taken into the body will meet a different requirement. At least three meals a day should be fed without skipping any of the meals, and the nutrients found in four food groups at each meal should be consumed in quantities appropriate to the needs of the elderly person. Due to the decreased sense of thirst, attention should be paid to the amount of liquid taken, while freshly squeezed juices, buttermilk, milk and soups should be preferred instead of acidic drinks in liquids taken. The consumption of fruits and vegetables rich in vitamins, minerals and pulp should be increased; bread and cereals should be consumed in appropriate amounts. Attention should be paid to cooking techniques; methods such as grilling, stewing, baking should be preferred instead of frying. The consumption of saturated and trans fats should be avoided. Instead of heavy desserts and pastries, the consumption of lighter milk desserts should be recommended. Excessive salt consumption should be avoided.

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