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CLINICAL PHARMACOLOGICAL APPROACH TO THE RATIONAL TREATMENT OF INFECTIOUS DISEASES

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Abstract:

The article summarizes the literature data on therapeutic nutrition, including that of infectious patients. The variants of diets according to Pevzner are given in accordance with the variants of standard diets used in the treatment of infectious patients. A brief description of artificial therapeutic nutrition in the therapy of patients with various infectious diseases is given. Particular importance is given to the scientific substantiation of therapeutic nutrition in the complex therapy and rehabilitation of infectious patients. The correct choice of therapeutic nutrition contributes to the normalization of lost functions and the fastest possible restoration of the human body after an infectious disease.

Keywords: Therapeutic nutrition, method, treatment, diet, infectious patient.

INTRODUCTION

Therapeutic nutrition is the basis for successful complex etiopathogenetic therapy of infectious patients. S.P. Botkin was the first to point out the need to give mixed food in infectious diseases, since one-sided nutrition aggravates the course of the disease. Through scientific research, Academician I.P. Pavlov and his students were the first to reveal the basic laws of digestion processes in the body. The works of I.P. Pavlov formed the basis for the fruitful development by domestic physiologists and clinicians (M.I. Pevzner, O.P. Molchanov) of fundamentally new methods of therapeutic nutrition for diseases [1].

MATERIALS AND METHODS

The founder of Russian dietetics M.I. Pevzner recommended not to allow a feverish patient to go hungry, but to give him a sufficient amount of food in small portions over one hour [2]. He was against overfeeding the patient, even if his appetite was preserved. At the beginning of the 20th century, the theory of balanced nutrition was formulated, which was successfully and thoroughly developed in our country by Academician A.A. Pokrovsky [3]. In the 1980s, the founder of trophology, Academician A.M. Ugolev, who discovered membrane digestion, formulated the basic provisions of the theory of adequate nutrition [1]. In recent years, new concepts of "optimal" and "functional" nutrition have been developing [4].

RESULTS AND DISCUSSION

Nutrition of a healthy and sick person cannot be defined as a simple supply of the body with a certain set of chemical elements. This is a complex process in which the gastrointestinal tract interacts with other organs and systems of the body and serves as a source of a huge number of hormonal signals. Regulation of the gastrointestinal tract is carried out by the central and peripheral nervous system, with the participation of a number of endocrine glands of the body and cells of the APUD system of the gastrointestinal tract [5]. Prescribing therapeutic nutrition requires an analysis of the patient's body's need for nutrients. According to accepted physiological nutritional standards, for an adult, the most favorable ratio of proteins, fats and carbohydrates is 1:1:4, that is, for 1 g of proteins there should be 1 g of fats and 4 g of carbohydrates.

To assess protein requirements, the nitrogen balance is determined using the following formula:

Nitrogen balance (g/day) = (protein consumed/6.25) – (AM+4), where AM (urea nitrogen) = 0.466 urea (g/day), 6.25 is the coefficient (1 g of nitrogen is equivalent to 6.25 g of protein).

With a positive nitrogen balance of at least 4–6 g per day, an increase in body weight is achieved. The daily requirement for fats is on average 80–90 g, of which 30% should be provided by vegetable fats. In human nutrition, a combination of 30% saturated, 60% monounsaturated and 10% polyunsaturated fatty acids is considered optimal. According to the standards adopted in the Russian Federation, the recommended consumption of saturated fats is 25 g/day, polyunsaturated fatty acids – 11 g/day. For a healthy person, the ratio of polyunsaturated and saturated fatty acids is 0.3 (1/3 vegetable and 2/3 animal fats). In some diets, the content of vegetable fats should be 40-50% [4].

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Carbohydrates are the main source of energy in food. On average, the daily requirement for carbohydrates is 350-500 g. The main carbohydrate monomer, the supplier of energy, is glucose. Cellulose with an admixture of hemicellulose and lignin (not a carbohydrate) is combined under the name "dietary fiber". Cellulose, pectins and other indigestible non-starch polysaccharides are dietary fiber. The need for dietary fiber is 25-30 g per day [5].

Vitamins and vitamin-like substances play an important role in human life. Vitamins are water-soluble (vitamins C, B1, B2, B6, B12, vitamin PP, folate, pantothenic acid, biotin) and fat-soluble (vitamins A, D, E, K). Vitamin-like substances include: choline, inositol (mesoinositol), para-aminobenzoic acid, lipoic acid, orotic acid, pangamic acid (vitamin B15), vitamin U [5].

Along with proteins, fats, carbohydrates and vitamins, minerals are vital components of food. There are no clear criteria for dividing minerals into macro- and microelements. Microelements are usually considered to be minerals whose concentration in tissues is low and is measured in micrograms per 1 g or 1 l. Concentrations of macroelements are several orders of magnitude higher. Macroelements include calcium, phosphorus, magnesium, potassium, sodium, chlorine and sulfur. Microelements include iron, copper, manganese, zinc, cobalt, iodine, fluorine, chromium, molybdenum, vanadium, nickel, strontium, silicon and selenium [2]. The need for nutrients is closely related to the body's energy needs. The main suppliers of energy for the body are carbohydrates and fats, and if they are not consumed sufficiently, proteins. 1 g of digestible carbohydrates, when oxidized in the body, yields 4 kcal (16.7 kJ). When oxidized in the body, 1 g of fat yields 9 kcal (37.7 kJ), 1 g of protein - 4 kcal (16.7 kJ). To maintain a stable body weight, energy intake should correspond to its expenditure. The energy requirement of a healthy person is on average 35-40 kcal / kg of body weight (2500-2800 kcal for a weight of 65-70 kg) and mainly depends on the level of physical activity. The energy requirement of a patient is determined by the degree of metabolic stress and the presence of fever. Energy expenditure is determined by the basal metabolic rate (BMR). In clinical practice, the Harris - Benedict formula is used to calculate the BMR (kcal / day).

In infectious diseases, energy expenditure increases by at least 10% for each degree of increase in body temperature. Consequently, with a fever corresponding to 39° C, energy expenditure increases by 30% and energy supply should be equal to 3250–3600 kcal in the above-mentioned cases. Depending on the nutritional indicators of the rate of metabolic processes and the severity of nitrogen losses, the energy needs of a sick person fluctuate from 25 to 45 kcal per 1 kg of body weight per day. In this case, it is also necessary to take into account the specific dynamic action of food. The specific dynamic action of food (SDA) is the energy expenditure on digestion, absorption, transport and assimilation of nutrients. Approximately 15–30 minutes after eating, energy metabolism increases, reaching a maximum after 3–6 hours and persisting for 10–12 hours. The most pronounced specific-dynamic effect is inherent in proteins. They increase the basal metabolism to 30-40% of the total energy value of proteins introduced into the body; moreover, proteins of animal origin have a more pronounced effect. The increase in metabolism occurs in 1.5-2 hours and continues for another 6-7 hours after eating. The specific-dynamic effect of carbohydrates is only 4-7% and lasts up to 4-5 hours, and fats 2-4% and lasts up to 12 hours. The energy expenditure of the body in connection with the specific-dynamic effect of a mixed diet increases on average by 10% of its total energy value [3].

CONCLUSION

Thus, in complex therapy and rehabilitation of infectious patients, scientifically based nutrition occupies one of the leading positions. The correct choice of therapeutic nutrition contributes to the normalization of lost functions and the fastest possible recovery of the human body after an infectious disease.

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