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The nurse's role in the prevention and diagnosis of malnutrition in patients in Intensive Care

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Summary

Nutritional therapy, also known as clinical treatment is an important component of modern treatment of patients in each of the Polish hospital wards. It includes nutritional assessment, evaluation nutritive requirements and nutritive, an adequate supply of proteins, fats, electrolytes, trace elements and water, taking advantage of the way the gastrointestinal tract, or by intravenous administration [4,5]. In Poland in the Regulation of the Minister of Health of 15 September 2011, the assessment of the nutritional status of the patient, taken on the hospital ward is mandatory excluding patients from emergency departments [6,7,8]. Malnutrition is a disease of multifactorial etiology, in the diagnosis, which plays a very important role cooperation of the whole therapeutic team - nutrition. The nurse, as a member of the team, plays an essential role in the prevention and diagnosis of malnutrition in patients staying in intensive care. Nursing staff, the first to have direct contact with patients, exercising care over him. Direct contact and careful observation, to allow diagnosis of early symptoms of malnutrition [10].

Keywords: malnutrition, nurse, prevention

Introduction

The history of the implementation of nutritional therapy to Polish hospitals, necessarily associated with 1948. The time came when the Polish Robert Elman, the invitation of the Board of the Association of Polish Surgeons [1]. Robert Elman a scientist who parenteral nutrition added protein hydrolysates in patients after surgery and developed to indicate the inclusion of parenteral nutrition [2,3,4]. While in Poland he represented and taught surgeons indications and for including parenteral nutrition the use of glucose and the amino acid hydrolysates. In the early sixties in Polish hospitals, patients with indications, parenteral nutrition was introduced using a home glucose and amino acid preparations and fat emulsion was imported from Sweden [1]. In 1952 the Department of Pharmacy "Polfa" Lublin, it has been the production of a hydrolyzate of amino acids and a few years later 1,963 years registered a 10% fat emulsion "Intralipid" imported from Sweden [1]. Another important date in the history of nutritional treatment in Poland is the year 1986, then it is appointed for life Section parenteral and enteral nutrition Polish Medical Society, whose chairman is Bruno Goldfinch. The task of the section is chaired by Bruno Goldfinch. The task of the section is chaired by Bruno Goldfinch. The tasks of the section included: organization of training courses, conferences, therapeutic activities, training and learning nutritional therapy in each of the Polish regions. In 1998, Section Parenteral and enteral Polish Medical Society, has evolved into the independently acting Polish Society of parenteral and enteral nutrition PTŻPiD, whose president was Bruno Goldfinch [1].

Epidemiology of malnutrition

Nutritional therapy, also known as clinical treatment is an important component of modern therapy patients in each of the Polish hospital wards. It includes nutritional assessment, evaluation nutritive requirements and nutritive, an adequate supply of proteins, fats, electrolytes, trace elements and water, taking advantage of the way the gastrointestinal tract, or by intravenous administration [4,5]. In Poland in the Regulation of the Minister of Health of 15 September 2011, the assessment of the nutritional status of the patient, taken on the hospital ward is mandatory excluding patients from emergency departments [6,7,8]. On 8 November 2012 has been modified Regulation of the Minister of Health of 1 January 2012, speaking about the obligation of the respective assessment of nutritional status using the NRS 2002 (called. Nutritional Risk Screening 2002- NRS) and SGA (ang. Subjective Global Assessment -SGA) and forms to join the medical records of all patients [8,9].

Epidemiological study, pay special attention to the problem of malnutrition among hospitalized patients. Suitable nutritional treatment of patients in intensive care is one of the most important treatment process [13,14]. Statistics show that only 50% of patients in intensive care, is properly implemented and conducted nutritional therapy [10,11,13,14]. About 15% to 60% of patients admitted to the hospital, malnourished and half of them are characterized by severe malnutrition step [5,12,13]. Malnutrition is a condition that carries a number of consequences for the patient and the hospital [5,6,8]. Together with malnutrition proportionally increasing the amount of complications and costs of the treatment process, prolonged period of hospitalization and convalescence of the patient time [8]. policy and nutritional treatment [7,8]. Unrecognized and untreated malnutrition in Polish hospitals, it may be the result of too small a cast of people responsible for the nutritional care policy [5]. Another reason is the lack of a reliable and clearly formulated guidelines and indications the management of patients diagnosed with malnutrition or patient groups at increased risk of malnutrition, having its pathogenesis in the hospital [5,6,7]. A study published in 1994-1995, pay attention to the problem of malnutrition among patients in intensive care and admitted to the hospital, both in the United Kingdom and the United States

[13,14]. Malnutrition, concerned from 43% to 55% of patients and from 10% to 15% of the patients, characterized by a severe degree of malnutrition, a negative affect on the overall process of treatment [13,14,15]. Lack of nutrition policy, it is often the cause of worsening the state of malnutrition among patients. In 1998 in Italy, multicenter study was conducted in which participated about 750 patients. The results showed that for a period of 15 days stay in hospital patients, the incidence of malnutrition has increased from 19, 1% to 60% [14,15,16]. Malnutrition is a medical condition, which quite often is undiagnosed and untreated among patients admitted to the hospital. International Classification of Diseases malnutrition classified as a separate condition [7.12]. According to the classification of the disease and malnutrition are known as "malnutrition" a code (E40-E46) [12]. The diagnosis of malnutrition should be a priority, each member of the therapeutic team. On the nurse treatment team member having direct contact with the patient's responsibility prevention, which includes patient education, participation in the diagnosis and treatment process of the patient at risk of malnutrition or undernourished [5,6,7].

Definition and types of malnutrition

Malnutrition is a medical condition resulting from shortage of nutritive requirements and nutritive, increased demand for ingredients or their loss due to various pathologies in progress in the body [4,5]. European Society of parenteral and enteral nutrition (ang. European Society for Clinical Nutrition and Metabolism) malnutrition is defined as a condition resulting from the lack of absorption or lack of consumption of substances habits, leading to changes in body composition, impaired physical and mental functions of the body and to adversely affect outcome primary disease [5,10]. Depending on the type of component, which is a deficiency distinguished, malnutrition type: Kwashiorkor, marasmus and mixed [7,8,10]. Malnutrition Kwashiorkor is a type of type, wherein the body is to decrease the concentration of proteins in serum, and the resistance at the cellular level. Most consequence of this type of malnutrition, is a decline in the level of proteins that are characterized by a short half-life eg. Albumin, transferrin, prealbumin [7,8,9]. Malnutrition type Kwashiorkor higher stage leads to generalized edema and disorders of the water-elektroliowej. This type of malnutrition mostly affects patients with extensive injuries, surgeries and infections, previously well-fed [7,9,10]. It results from severe catabolism and insufficient supply of nutrients that meet the demands of the body [10]. If untreated, malnutrition Kwashiorkor type, consequently it leads to death of the patient due to disturbances in the water and electrolyte and metabolic acidosis [10]. Malnutrition marasmus type, referred to as cachexia, is characterized by a decrease in body weight and maintaining normal levels of serum proteins; including albumin, undergoing reduction in end form of the disease [10]. The pathogenesis of type marasmus malnutrition, is associated with chronic ongoing starvation [7,8,9]. This is called soft malnutrition, which does not mean that it may have some negative consequences affecting the body, especially following trauma or surgery conducted. Treatment of this type is the slow malnutrition, adapted to the needs of the introduction of the feeding by the enteral [7,8,9,10]. Malnutrition is the third kind of mixed malnutrition, the most common [10]. in serum and body fat reduction, due to the inadequate supply of nutrients or hypercatabolic induced trauma or extensive surgery [10]. Each type of malnutrition, carries a number of dangerous consequences for the organism. As a result of malnutrition may occur; weight reduction immunodeficiency level cell disturbances in fluid and electrolyte, atrophy of the intestinal mucosa, and anemia. Malnourished patients hospitalized greater exposed to infection and complications after surgery: impaired wound healing, and anastomotic dehiscence, a significant prolongation of hospitalization and recuperation, increased risk of death and an increase in costs incurred for the healing process [7,8,9, 10,11].

Methods of assessment of nutritional status of patients in the Intensive Care ward

Assessment of nutritional status for the purpose of puts the identification malnourished patients, patients having an increased risk of malnutrition, at risk of malnutrition and diagnosis of the severity of malnutrition, to identify the cause and monitoring the effectiveness of medical nutrition therapy [6,7,10]. Assessment of nutritional status of the patient in the intensive care unit (ICU) involves, testing and monitoring indicators of metabolic status, nutritional status and physiological functions [11,12,14]. Minister of Health of 22 November 2013, obliges each ICU team to assess the nutritional status using the Subjective Global Assessment of nutritional status (ang. Subjective Global Assessment - SGA) and form a screening risk assessment of malnutrition in 2002 NRS I and II (ang. Nutritional Risk Sceeening 2002) [16]. The assessment of the nutritional status of the patient consists of a detailed anamnesis, conduct surveys, perform anthropometric and laboratory tests. The first step in the assessment of nutritional status are screened. Screening assessment of the risk associated with malnutrition is the duty of every Polish hospital wards, except for emergency departments [8,9]. Each on admission to the hospital to assess the nutritional status I use a standardized questionnaire including; Subjective Global Assessment of nutritional status (ang. Subjective Global Assessment -SGA) form a screening risk assessment of malnutrition in 2002 NRS I and II (ang. Nutritional Risk Sceeening 2002). Form screening risk assessment malnutrition NRS 2002 (called. Nutritional Risk Sceeening 2002), was developed by ESPEN (ang. European Society for Clinical Nutrition and Metabolism). On the basis of the form is determined by nutritional risk and determine the indications for the implementation of nutritional therapy. The form also allows to determine the scale of severity of the disease and the screening of the initial and final. The result, which can be obtained in the range from 0 to 7 points. The first part of the form consists of four questions regarding the assessment of the nutritional before hospitalization, the next four relate to assess the impact of risk factors in the course of the proposed treatment. Patients over 70 years of age receive an additional point, an indication to implement nutritional treatment applies to patients who received 3 or more points [C7,8,10]. in 1982 [16]. This is a scale that includes questions about the changes in body weight changes in food intake, symptoms of adverse gastrointestinal, physical fitness, current diseases, physical examination as well as subjective evaluation of nutritional status. Eligible patients to one of the groups describe nutritional status: normal nutritional status, malnutrition or suspected average degree of malnutrition, cachexia high risk nutrition [C7,8,10]. Another scales for assessing nutritional status are: universal screening method for assessing malnutrition (ang. Malnutrition Universal Screening Tool-MUST), miniscale ocean nutritional status (ang. Mini Nutritional Assessment) [10]. Research and symptoms is another element in the assessment of nutritional status. [10] A detailed interview is conducted by a physician and a nurse, his goal is to obtain information and to check for the presence of characteristic symptoms of malnutrition [7]. On physical examination, particular attention should be paid to symptoms such as; wasting, loss of subcutaneous tissue, the ongoing inflammation in the oral cavity, keratosis, hair loss, brittle nails glossitis, humus, enlarged cardiac resting tachycardia, pleural effusion, ascites, pain and muscle atrophy [8]. In the assessment of nutritional status are also used, anthropometric, biochemical and immunologic disorders [8,9]. Anthropometric studies to include; measuring the weight, height, calculation of body mass index (BMI called. Body mass index), thickness measurement fatty fold, arm circumference, the measurement of unintentional weight loss [8,9]. Laboratory tests based on the determination of albumin, transferrin, and transthyretin retionol binding protein, fibronectin, and insulin-like growth factor-1 IGF-1 levels, the total number of cells in 1 mm³ of blood, determination of nitrogen balance [7,8,9,10] . Malnutrition is a condition that leads

to a decrease in protein concentration serum and impairs the immune response. In the assessment of nutritional status are also used in functional studies: spirometry, dynamometry, small direct muscle stimulation [8,9,10].

Nutrient requirements

One of the basic elements, the assessment of nutritional status of the patient in the intensive care unit, it is rigorously determine its requirements for essential nutrients, ie. Fats, carbohydrates, water, minerals, and energy [10]. Standard transformation of matter (ppm) determines the lowest level of transformation and energy consumption in a human at rest and fasted [7,8]. This is the resting energy expenditure is used for the basic processes of life, ie. The work of respiratory, muscle, cardiovascular system, the maintenance of body temperature, activity of the digestive system, etc. [10]. The smallest daily energy supply, allows to keep their own resources protein and energy vital processes, is 1 kcal / kg / 24 hours [8]. In planning to accept nutritional therapy, the energy requirements of an adult is approximately 25 Kcal to 35 Kcal / kg / 24 hours, wherein the protein should be included 1 g of the protein is equal to 4 kcal [9]. Condition forces the effort to increase the energy. The basic requirement for protein is about 0,9-1,2 g / kg body weight due / 24h. Each trauma, infection, and surgery increases the consumption and demand for protein and energy. The daily demand for glucose is approximately 4 to 5 g / kg [7,8]. Oversupply of glucose, resulting in the storage of muscle and liver or deposition in the form of fat. Carbohydrate, is adjusted by the metabolic status of the system and the secretion of endogenous insulin. Average demand for fat is from 0,8 to 1,5 g / kg / 24 h [7,8,9]. Fats are a source of energy, essential fatty acids and fat soluble vitamin ADEK [9]. In order to determine the water demand, different patterns are used, for example. 1 ml of water for 1 Kcal of energy fed patients who know the exact supply of energy. The basis for determining the supply of water fed patients should be carefully maintained balance fluid [10]. The demand for electrolytes is determined based on the current demand and losses. To the electrolyte depletion occurs when; diarrhea, vomiting, trauma, etc. from the tubing. [7,8,10,11]. In the ICU, patients debilitated with increased catabolism in renal failure, respiratory and circulatory diseases, injuries, etc. The need for the so-called energies. Caloric intake is higher in relation to the basic requirements [16]. In order to determine the demand of the energy band therapeutic speak the design Harris-Benedict [10,16]. Taking into account the factors influencing energy expenditure, it allows for determination of the specific [16, 17].

Female: BEE = 66.5 + (9.6 * W) + (1.8 * H) - (4.7 * A)

Male: BEE = 66.4 + (13.7 * W) + (5 * H) - (6.7 * A)

Legend:

- BEE- basic energy expenditure,
- H- Height [cm]
- A-age

Formula: Harris Modified Benedict-Longa:

L-BEE BEE = * A * S * T

Legend:

A patient activity-	S-general condition	T-body temperature
1,0-lying in bed	1,0-standard	1-37° C
1,1 As the bed	1,1 medium heavy	1,1-38° C
1,2 full activity	1,2-very heavy	1,2-39° C; 1,3-40 ° C

Source: own study [16].

Risk factors for malnutrition in patients in intensive care

Risk factors that predispose to the development of malnutrition in intensive care patient is much, malnutrition pathogenesis is multifactorial[14,15,16]. Among them they stand out; substitution and insufficient supply of nutrients, increased demand for energy and protein, which is the result of hypercatabolic caused by the underlying disease, depletion of components due to; diarrhea, vomiting, renal disease, co-morbidities of the layout of: the circulatory, digestive, respiratory and renal drug [10,16]. Patients in intensive care, are characterized by excessive inflammatory cytokines in the blood and tissues, e.g., excessive hormone levels. Cortisol, glucagon, and catecholamines or resistance of peripheral tissues to endogenous anabolic hormones [16]. Supine position, the minimum physical activity, Mechanical ventilation and relaxant drugs are the main predisposing factors to muscle atrophy and cause inhibition of protein anabolic response [10,16]. Each trauma, infection, surgery increase the demand Protein-calorie [10]. Tissue damage carries a number of symptoms, tachycardia, increased blood pressure, stimulation of the sympathetic nervous system and redistribution of the blood to the skeletal muscle [5,10]. The inflammatory response of the body, in response to the primary disease, leads to an increase of cytokines; TNF- α , IL-1, IL-6, IL-10. The place of cytokine production is also damaged intestine tissue. Excessive cytokine secretion, provoke initiation complex metabolic and endocrine response, which may result in multiple organ failure called MOF. Multipleorgan failure. And metabolic responses to the body mobilizes hypermetabolism a result, operation of catabolic hormones: glucagon, catecholamines, corticosteroids, and insulin resistance [10,17]. On Time nutritional intervention in patients in intensive care it is extremely important. Early nutritional treatment for 36 hours, reduces the risk of complications after surgery, sepsis, pneumonia. European Society of Parenteral and Enteral Nutrition (ang. European Society for Clinical Nutrition and Metbolism), we recommend the inclusion of enteral nutrition from 24 to 48 hours in patients with severe trauma without the possibility of enteral nutrition [16,17,18]. On Time nutritional intervention in patients in intensive care it is extremely important. Early nutritional treatment for 36 hours, reduces the risk of complications after surgery, sepsis, pneumonia. European Society of Parenteral and Enteral Nutrition (ang. European Society for Clinical Nutrition and Metbolism), we recommend the inclusion of enteral nutrition from 24 to 48 hours in patients with severe trauma without the possibility of enteral nutrition [16,17,18]. On Time nutritional intervention in patients in intensive care it is extremely important. Early nutritional treatment for 36 hours, reduces the risk of complications after surgery, sepsis, pneumonia. European Society of Parenteral and Enteral Nutrition (ang. European Society for Clinical Nutrition and Metbolism), we recommend the inclusion of enteral nutrition from 24 to 48 hours in patients with severe trauma without the possibility of enteral nutrition [16,17,18].

Summary

Malnutrition is a disease of multifactorial etiology, in the diagnosis, which plays a very important role cooperation of the whole therapeutic team - nutrition. The nurse, as a member of the team plays a vital role in the prevention and diagnosis of malnutrition in patients staying in intensive care. Nursing staff, the first to have direct contact with patients, exercising care over him. Direct contact and careful observation allows to diagnose the early symptoms of malnutrition. The tasks of the nurse should perform tests anthropometric, blood sampling for laboratory testing, patient education, active participation in the nutrition of the patient, assessment of nutritional status. Careful execution of tasks by each member of the therapeutic team, allows identification of patients who are malnourished and sick group incremented risk of malnutrition. All actions taken in order to minimize complications posed by malnutrition.

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