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# CHANGE IN THE NUTRITIONAL STATUS OF CHILDREN SUBMITTED TO HOSPITAL HOSPITALIZATION: LITERATURE REVIEW

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**Abstract: Goal:** This study aimed to verify the factors that favor child malnutrition during hospitalization. **Methods:** An exploratory literature review study of a quantitative nature was carried out. **Conclusion:** Although the prevalence of child malnutrition has decreased, the percentage of hospital malnutrition among children remains high. There are numerous causes that contribute to this data. Therefore, nutritional assessment must be part of the routine care of these patients in order to identify children at nutritional risk in order to direct an appropriate nutritional intervention. Reducing hospital morbidity and mortality rates.

**Keywords:** Nutritional status, hospital admission, nutritional assessment, hospitalized child, nutritional screening, anthropometry.

## INTRODUCTION

Several studies show that malnutrition has been a highly prevalent problem in the hospital environment for at least 2 decades and is correlated with a higher risk of clinical complications and longer hospital stay. The initial stabilization phase is particularly aimed at severely malnourished children in hospitals, whose food plan must be varied in order to avoid monotony and favor acceptance, initially seeking to correct food errors and increase caloric intake. -protein, the introduction of food must be gradually increased until the calculated needs for nutritional recovery are reached (KRAUSE, 2004).

A significant reduction in the prevalence of protein-energy malnutrition has been observed in the literature in several parts of the world, including Brazil. Despite this fact, this disease still presents itself as an important public health problem, especially in children under five years old with high lethality rates. For Rocha et al (2006):

> The assessment of nutritional status is of fundamental importance to investigate whether a child is growing within the recommended standards or is moving away from them due to illness or unfavorable survival conditions. Measuring a child's growth is one of the most efficient ways to assess their general health condition, preventing damage from malnutrition.

In view of the panorama of malnutrition in Brazil in the hospital environment and its association with the increase in morbidity and mortality, it is important to establish nutritional diagnosis, nutritional assessment and nutritional therapy in hospitalized patients in order to provide better care and with that improve their nutritional status (REZENDE et al., 2004).

For Dal Bosco (2010) the appropriate choice of nutritional therapy in sick patients promotes improvement in clinical treatment, prognosis and avoids complications. However, it must be taken into account that, in order to provide adequate nutritional support to sick children, extensive knowledge of metabolism, underlying disease and clinical experience is required, as the child normally presents a greater nutritional risk due to the growth factor that decreases or ceases in the face of a nutritional problem.

> Historically, nutritional assessment emerged around 1936, in the hospital area, when Studley related weight loss in patients with peptic ulcer submitted to surgery with an increase in postoperative complications. The monitoring of body weight has become a relevant data in the follow-up of surgical patients. The first nutritional risk indicator was established (ROSSI, 2008).

In order to carry out the nutritional assessment, it is necessary to use the results of the anthropometric assessment, Rossi (2008) describes anthropometry as obtaining physical measurements of an individual to relate them to a pattern that reflects their growth and development. In the monitoring of child growth, it is necessary to measure the physical variations that determine this process, with the need for them to be standardized. The advantages of anthropometry are: it is a simple, low-cost method and provides standardization of the data obtained.

According to Nozaki et al (2013), hospital malnutrition is a fact that is currently present and constitutes an important public health problem, associated with mortality and morbidity, quality of life, time and cost of hospitalization. Some patients are malnourished even before admission, others become malnourished during the period of hospitalization. Based on this, nutritional screening instruments were created, which are forms with clinical and anthropometric evaluation elements that aim to predict the occurrence of complications associated with malnutrition. Thus, the concept of nutritional risk emerged, by which the presence of risks arising from nutritional status is verified.

According to the same author, nutritional screening is a simple and easy survey, carried out at hospital admission, with the aim of detecting the presence of risk of malnutrition and thus verifying the need for an additional nutritional assessment, which in turn determines the nutritional status.

For Krause (2010) different factors help to assess whether the individual is at nutritional risk, they are: food and nutrient intake patterns, psychosocial factors, physical conditions associated with particular disease states and disorders, biochemical abnormalities and medication schedules. Nutritional screening and assessment are integral parts of the nutritional therapy process, which has 4 phases, screening is the first phase of this process, followed by assessment of nutritional status, identification of nutritional diagnoses, interventions with nutritional therapy, such as dietary changes, nutritional supplementation, education,

counseling, referrals and monitoring and evaluation of the effectiveness of interventions. Nutritional screening precedes the nutritional treatment process, its purpose is to quickly identify malnourished or nutritionally at risk individuals and determine whether a more detailed nutritional assessment is necessary.

According to Rossi (2008) nutritional assessment is the approach for defining nutritional status using medical, food and drug histories, physical examination, anthropometric measurements and biochemical examination. In other words, nutritional assessment involves the interpretation of multiple indicators for the definition of a nutritional diagnosis, the collection of information for the elaboration of the intervention plan and the monitoring of the adequacy of the nutritional intervention. Adequate nutritional status is achieved from the balance between food supply and demand. The latter includes basal expenditure for organic functions and expenditure for physical activity and specific needs, such as growth and pregnancy. When considering a disease state, the needs for organic response must also be included, imbalances result in altered nutritional status, called malnutrition.

Despite the existence of numerous studies on the prevalence of malnutrition in children worldwide, the assessment of nutritional status in hospitalized children is often neglected, contributing to the occurrence of complications (CRUZ et al, 2009).

According to Barbosa et al (2013), Protein Energy Malnutrition is a multifactorial disease that involves biological and social determinants, and can be of primary origin, when the food supply of energy and nutrients is insufficient, or secondary, due to the increase in energy expenditure. due to organic dysfunction or inadequate functional and biological use of available nutrients. EPD can start early as a result of inappropriate feeding practices, such as early weaning and inadequate introduction of complementary foods. It can also be influenced by other factors, such as the socioeconomic situation of the family, weak mother-child bond and lack of knowledge of the mother in relation to child care. According to the same author, some chronic diseases in childhood and adolescence often lead to secondary malnutrition resulting from all the metabolic and functional alterations due to the pathological process associated with such diseases.

The reality of protein-energy malnutrition is documented in several scientific studies around the world, in Brazil, the Brazilian Society of Parenteral and Enteral Nutrition (SBNPE), in 1996 developed the Brazilian Inquiry for Hospital Nutritional Assessment (Ibranutri), which is a study epidemiological study that evaluated the nutritional status of four thousand patients hospitalized in the public network of 12 Brazilian states and the Federal District, this study revealed that 48.1% of hospitalized patients were malnourished. In 1999, the SBNPE developed another nutritional assessment survey that aimed again to quantify hospital malnutrition. The results obtained with this survey went beyond the high rates of hospital malnutrition, the absence of adequate nutritional intervention procedures that would enable the recovery of nutritional status. According to the Ministry of Health, in Brazil, the hospital case fatality rate of hospitalized children with severe energy malnutrition is 20% and this rate can be ten times higher compared to normal weight children (MALAFAIA, 2009).

Child malnutrition is a disease of great importance in public health, children affected by this pathology have high morbidity and a higher prevalence of hospitalization. Early recognition and effective treatment can shorten hospitalization time and minimize complications. Nutritional therapy is very

variable, so the nutritional assessment must be carried out at the patient's admission and continued during the period of hospitalization to obtain greater control of the treatment with the objective of recovering the nutritional status (OLIVEIRA et al., 2005).

One of the methods used to diagnose malnutrition is nutritional assessment. This must be performed routinely for all individuals. However, the assessment of healthy individuals differs for those seriously ill, patients at nutritional risk can be identified through screening information, which are instruments used in the patient's hospital admission. The information obtained in the nutritional assessment is used to develop the treatment plan, increasing the effectiveness of hospitalization, education and nutritional counseling (KRAUSE, 2010).

Different factors help to assess whether the individual is at nutritional risk, one of the recommended methods to verify nutritional status is the use of anthropometric measures such as weight and height, in children the three anthropometric indices used are weight/ height, height/age and weight/ age. These measures are recorded as percentiles, which reflect the percentage of the total population of children of the same sex who are of equal or lesser height and weight at a given age. The assessment of nutritional status at the time of hospital admission is extremely important to establish goals to improve early nutritional intervention strategies, in order to recover or maintain nutritional status during the period of hospitalization (CRUZ et al, 2009).

Nutritional assessment is an approach performed to define nutritional status using clinical, social, nutritional and medication history, physical examination, anthropometric measurements and laboratory tests. Nutritional assessment involves the interpretation of nutritional screening data and incorporates additional information. Nutritional screening precedes the nutritional treatment process. Its purpose is to quickly identify malnourished or nutritionally at risk individuals and determine whether a detailed nutritional assessment is necessary (KRAUSE, 2010).

The identification of nutritional risk factors in patients at the time of hospital admission selects those who need early nutritional intervention, in an attempt to reduce the risk of complications during hospitalization.

### PROBLEM

What are the factors during hospitalization that favor child malnutrition?

### JUSTIFICATION

Child malnutrition is a major public health problem in less developed countries, and as a result, the importance of monitoring developments is justified.

Nutritional status of hospitalized children in order to obtain an early diagnosis of malnutrition and, through the monitoring of nutritional status, contribute to a better planning of actions aimed at minimizing hospital malnutrition, providing patients with better recovery and shorter hospital stay.

## OBJECTIVES

### GENERAL PURPOSE

To verify the factors that favor child malnutrition during hospitalization.

### SPECIFIC OBJECTIVES

To verify the prevalence of malnutrition in hospitalized children. To describe the factors that favor the weight loss of hospitalized children. Relate the consequences of weight loss in health care.

## METHODOLOGY

An exploratory literature review study of

a quantitative nature will be carried out. The bibliographic review seeks to bring a summary of the literature on the proposed theme based on consultations in several articles, published in Brazil and abroad, considered important, based on the author's own opinion (VIEIRA; HOSSNE, 2003; GIL; 2002).

This research aims to verify the factors that favor child malnutrition during hospitalization.

The databases consulted for the research will be Google Scholar, Lilacs, Scielo and books. Current references were used, excluding those published before the year 2007. In this, the descriptors will be used: Nutritional status, hospitalization, nutritional assessment, hospitalized child, nutritional screening, anthropometry.

The data used in this study will be duly referenced, respecting and identifying their authors and research sources, observing the ethical rigor regarding the intellectual property of the scientific texts that were researched, with regard to the use of content and citation of parts of the consulted works.

## DEVELOPMENT

### PREVALENCE OF MALNUTRITION IN HOSPITALIZED CHILDREN

Several authors described different aspects of malnutrition from the 1800s onwards and drew attention to the fact that extreme weight loss and/or edema resulting from the disease could lead to death. However, the disease was only described as a syndrome in the early 1930s and in Brazil it was first recorded in the 1950s. From then on, child malnutrition was recognized as a problem of a medical nature that also included vitamin deficiencies that cause diseases. such as: beriberi, pellagra, xerophthalmia and scurvy. At that time, poverty was established as the main cause of malnutrition, then discoveries about the pathophysiology of the disease and the synergistic association between malnutrition and infection were added. So, due to its multifactorial nature, malnutrition came to be seen as a social problem and not just a public health problem (MALAFAIA, 2009).

The high prevalence of malnutrition in hospitalized patients was first described in the mid-1970s, in which it was written as a continuous process that starts with inadequate nutrient intake in relation to their needs and progresses through a sequence of functional changes that precede changes in body composition. According to the WHO, a review of 67 studies showed that over 5 decades the mortality rate in hospitalized children with severe malnutrition has not changed, remains high, around 20 to 30% in some places, reaching 50 to 60% in others. Recent studies continue to report a high incidence of malnutrition in hospitalized patients, with rates that can reach up to 80% (MALAFAIA, 2009).

In view of these data, with the aim of evaluating hospital malnutrition, in 1996 the Brazilian Society of Parenteral and Enteral Nutrition (SBNPE) developed the Brazilian Survey of Hospital Nutritional Assessment (IBRANUTRI), an epidemiological and cross-sectional study that evaluated the nutritional status of 4000 patients hospitalized in the public network of 12 states and the Federal District. The study revealed that almost half of the hospitalized patients (48.1%) were malnourished (REZENDE et al, 2004).

Waitzberg (2004) in his study on the nutritional status and the prevalence of malnutrition in hospitalized patients revealed that 48% of the evaluated patients were malnourished, and 12.6% were severely malnourished. During hospitalization, malnutrition reached 61% when it lasted more than 15 days and in the poorest regions (North and Northeast) the prevalence of malnutrition was higher (68% to 78%).

The same author found that patients can develop malnutrition after hospital admission and also that 70% of patients who were initially already malnourished suffer a worsening of their nutritional status during hospitalization. Given these data, it is important to understand which factors cause malnutrition, whether due to reduced capacity to use food, or even simple loss of appetite.

Oliveira et. al (2010) reveals in his study that in Brazil, the percentage of deaths of children hospitalized for severe malnutrition remains around 20%, much higher than the value recommended by the WHO, which would be less than 5%. This situation is considered worrying when considering that hospitalized patients often suffer from worsening of their nutritional status. Currently, the country has rates of 5.7% for weight impairment and 10.5% for height.

According to the study by Magalhães et.al (2013), around 80% of malnourished children live in Asia, 15% in Africa and 5% in Latin America, with 43% of them (230 million) being chronically malnourished. Death rates from severe malnutrition undergoing treatment are high, each year, more than 200,000 children die before the age of five in the Americas, due to malnutrition and preventable diseases. Among children with severe malnutrition, 20 to 30% of them die during treatment in the health services of these countries.

Protein-energy malnutrition (PEM) is one of the main public health problems worldwide, due to its magnitude, biological consequences and social damage. In the Northeast of Brazil, severe forms of PED reach 24% of hospitalized children under five years old, and the hospital lethality in children with severe forms of PED is almost ten times higher compared to normal-weight children (FALHO; ALVES, 2002).

The high prevalence of malnutrition in hospitalized patients has been widely documented in recent decades, in which several studies that observe hospital malnutrition correlate its presence with a greater increase in the frequency of clinical complications, mortality, impact on costs and length of stay, as seen that the longer the period of hospitalization, the greater the risk of worsening malnutrition (PHILLIP; AQUINO, 2011).

Data from malnourished children treated at the Center for Nutritional Recovery and Education (CREN) in São Paulo show that more than 70% of them are born with low or insufficient weight. The picture of malnutrition in poor communities, especially in slums, begins to take shape before birth. In these children there is also a strong presence of childhood diseases, which are the main determinants of the severity of malnutrition. Data from CREN shows that, among children with moderate malnutrition undergoing treatment, about 80% had at least one infectious episode in the last month, and, among those with severe malnutrition, this prevalence rose to about 90%. The difference, therefore, is mainly given by the frequency of infections. In addition, 60% had parasites. Another very common occurrence is anemia, found in 62% of them (Sawaya, 2006).

The World Health Organization and the Scientific Department of Nutrition of the Brazilian Society of Pediatrics recommend that the hospital mortality rate of these children must not exceed 5%, and these deaths usually occur within the first 24 hours of hospitalization (SILVA and TIENGO, 2014).

The hospital lethality of these children is ten times higher when compared to normal weight children. A study carried out at the Instituto Materno Infantil de Pernambuco (IMIP) observed that, of 1045 needy children who died in the hospital in 1995, 60.1% had some degree of impaired nutritional status.

In 1998, 15.1% of severely malnourished

children who were hospitalized at the IMIP died (FALHO and ALVES, 2002).

Despite the fact that in recent decades there has been a significant reduction in the prevalence of protein-energy malnutrition (PEM) in children under five years of age in Brazil and worldwide, this disease remains a major public health problem in the country, especially in the North and Northeast, in rural areas and on the outskirts of metropolises, with serious consequences for children's growth, development and survival. Hospital malnutrition is a reality in our country, manifesting, on the one hand, the nutritional profile of the population and, on the other hand, nutritional problems associated with pathological processes (MAGALHÃES et al, 2013).

## FACTORS THAT FAVOR WEIGHT LOSS IN HOSPITALIZED CHILDREN

There are numerous causes that can trigger in-hospital malnutrition, among them: the absence of nutritional assessment, the inadequate supply of caloric-protein intake, the nutritional status at the time of hospitalization, prolonged hospitalization and still, it can be attributed to the underlying disease itself. Malnutrition in hospitalized patients is the result of a series of factors, which may be associated with the disease and/or treatment. One of the main causes of malnutrition is inadequate food consumption caused by loss of appetite or difficulty in eating food, in addition to fasting and changes in diet composition due to the need to carry out investigation and treatment procedures (PHILIPPI and AQUINO, 2011). Silva and Tiengo (2014) state that during the period of hospitalization, the child may respond with several biopsychobehavioral changes, resulting from the removal of their family environment, where their basic and emotional needs are constantly serviced.

Rocha et al (2006) reveals that the highest frequency of weight loss was observed in children with pneumonia, 76.27% of 59 children, despite the majority of them presenting adequate nutritional status on admission, probably resulting from long periods of fasting for examinations, non-recognition of the increase in caloric needs as a result of the infection, and, mainly, due to the routine in health services of indication of nutritional therapy as a prescription mandatory medical care, regardless of the child's previous nutritional conditions. Their study reveals that children who developed weight loss during hospitalization more often have pneumonia as a determinant of hospitalization and a length of stay of more than 9 days. The results obtained in their studies allow us to conclude that during hospitalization, weight loss was significantly related to the prolonged hospital stay and to the disease that led to hospitalization.

For Silva (2001), when the individual is sick, factors such as increased catabolism, pain, anxiety, new environment, decreased appetite, different diet, change in eating habits and schedules, use of medication, predispose or worsen malnutrition. hospital. In addition to these factors, iatrogenics was also mentioned in their research, in which attitudes such as not having anthropometric measurements, not observing food intake or not taking nutritional support measures can also contribute to worsening nutritional status.

Philippi and Aquino (2011) state in their study that changes in the digestive tract such as nausea and vomiting, diarrhea, changes in lips, mouth and throat and the presence of pain are changes in the digestive tract that make digestion and/or absorption difficult or impossible. of nutrients. Inadequate food intake was a factor associated with malnutrition. Another factor mentioned, associated with

weight loss during hospitalization, was the length of stay, children at nutritional risk or with previous malnutrition are more likely to have a prolonged hospitalization with a high incidence of infection, resulting in the appearance or worsening of malnutrition.

Andrade (2000) concluded that diarrhea is one of the factors that contribute to the weight loss of hospitalized children, as these children suffer important metabolic changes and decrease in food intake during diarrhea episodes, which generates a greater worsening of the nutritional status, making them susceptible to serious infections.

The same author makes a consideration in relation to the digestive-absorptive function, as macronutrients such as fats, proteins and carbohydrates, essential for weight gain and height, are lost due to poor digestion/ absorption.

For Waitzberg et al (2004) patients are often hospitalized undernourished, precarious socioeconomic conditions and an inefficient health system that is not able to provide early care to patients, especially the poorest, increase the risk of malnutrition. In addition, inadequate assessment, detection and nutritional intervention during the period of hospitalization contribute to further increase this risk.

Waitzberg (2004) states that food is one of the resources that human beings use to maintain life, an adequate diet is one that contains foods that meet the nutritional needs of each individual for maintenance, repair, growth and development of the organism. The function of food must be survival-oriented and accompany the child's developmental stages, so the child's food must be dynamic, requires creativity and often daring in the way of preparing and offering food. However, the hospitalized child, due to several factors, among them the decrease in the general state of health, may have a transient decrease in appetite, and on these occasions dietary changes must be made in the frequency, volume of supply and caloric density of meals in order to minimize the weight loss.

According to the same author, providing appropriate and adequate food and drinks to patients is part of nutritional care, through which it is possible to optimize protein and energy intake. The quality of hospital food, nutritional care and patient participation in their food and nutritional treatment are fundamental for the quality of nutritional care.

Appetite reduction is a variable that depends on the individual's information and can indirectly assess food intake. It can include small dietary reductions, even fasting. In addition, appetite may be preserved even in food reduction. In any case, the adequacy of energy intake and appetite must be monitored during the patient's hospitalization, and failure to meet estimated needs during this period can worsen weight loss (PHILIPPI and AQUINO, 2011).

Sick children typically have less appetite and food intake, children with these types of conditions are more likely to have behavioral problems in relation to food. "Hungry" children were three times more likely than "at risk of hunger" children and seven times more likely than "not hungry" children to have marks indicative of characteristics such as aggression, irritability, oppositional behavior, and anxiety ( KRAUSE, 2010).

Oliveira et al (2005) found that lack of appetite was one of the most common reactions in hospitalized children without family support, a disorder caused by fear, insecurity, anxiety resulting from changes and factors involved in hospitalization. In which, the child tends to change their eating habits as a return to bottle use, anorexia, in some cases regression in language and daily behavior.

Silva (2011) concludes that hospitalization

alone is one of the biggest risk factors for hospital malnutrition, and that the probability of a child being malnourished is directly related to the length of stay in the hospital, in which the longer the time, the greater the the chance of malnutrition, especially after 15 days of hospitalization.

Parcianello and Felin (2008) describe that during hospitalization the child is away from their family environment, from their school life, sometimes deprived of the company of their parents, their body is exposed to painful and unpleasant procedures, these factors impact the psychological state. of the child that may manifest as sleep problems, aggression, loss of weight and appetite, dermatoses, psychosomatic manifestations, unstable personality, affective lack, behavioral disorders, weakening of their physiological functions, being subject to contracting infections.

The increase in malnutrition during hospitalization is due to a sum of conditions, as shown in Table 1. To the causal factors of malnutrition at the time of hospital admission, there is added the greater consumption of energy and nutritional reserves of the patient, in response to treatments more aggressive such as surgery, radio and chemotherapy, along with possible losses from digestive disorders such as nausea, vomiting, paralytic ileus and diarrhea (KRAUSE, 2010).

## CONSEQUENCES OF WEIGHT LOSS ON HEALTH CARE

The clinical manifestations of protein-energy malnutrition are related to the period of time, degree of nutritional deprivation and previous health status, which can cause serious harmful effects on each organ. When kept on a prolonged diet of simi-starvation, healthy people generally experience a loss of heart tissue that parallels the loss of body mass, there are changes in lung and liver function, compromising the immune system, which in turn will lead to failures in the ability to fight bacterial and viral infections. Starvation, however, leads to an increase in susceptibility to infections, delay in wound healing, decrease in drug metabolism rate, in addition to deficit in physical and cognitive functions. If starvation is prolonged, complications arise that lead the patient to death (ESCOTT-STUMP, 2011).

Regarding the relationship between PED and infectious diseases, studies show that nutritional deficiencies can chronify and/or worsen the clinical picture of some diseases, such as tuberculosis, HIV infection, other diseases include: poliomyelitis, diphtheria, tetanus, hepatitis B and C, leprosy, dengue, encephalitis and intestinal infections, in addition to increasing the chances of premature death in children (MALAFAIA, 2009).

Also according to Malafaia (2009) the effect of malnutrition on the immune system has been widely accepted that immunity or susceptibility to various infectious and parasitic diseases are directly related to the nutritional status of individuals. DEP is the most common cause of immunodeficiency.

According to Oliveira et al (2010) severe protein-energy malnutrition (PED) causes global nutritional depletion of the patient, the decrease in glycogen and fat stores will promote a reduction in energy reserve, causing the protein mass to become a source of energy. In addition to macronutrient scarcity, there is also micronutrient deficiency (vitamin A and E, copper, magnesium, zinc and selenium), which contributes to immune system dysfunction, increased production of free radicals and reduced protein synthesis. Among the most frequent clinical and metabolic complications of PED are hypoglycemia and hyperglycemia, hypothermia, dehydration and diarrhea. As they do not present the classic

| RELATED TO DISEASE | CIRCUMSTANTIAL CAUSES | IATROGENIC MALNUTRITION |
|---|---|---|
| decreased appetite | Pain | Unmeasured weight/height |
| Decreased intake | Anxiety | Intense staff turnover |
| Increase in losses | New Environment | Division of responsibilities |
| Decreased Anabolism | different food | Failure to observe food intake |
| increase in catabolism | Changes in eating habits | Surgery in malnourished patients – absence of pre and postoperative nutritional therapy |
| | Medicines | No perception of increased caloric needs |
| | | Prolonged use of saline or glucose in the postpartum period operative |
| | | Delay in the indication of da enteral nutritional therapy |

Table 1: Different Causes of Hospital Malnutrition

SOURCE: Waitzberg, 2004.

| |
|---|
| Age less than 6 months |
| Weight-for-height deficit greater than 30%, or weight-for-age deficit greater than 40% |
| Stupor, coma, or other changes in mental status or level of consciousness |
| Infections, particularly bronchopneumonia or measles |
| Petechiae or bleeding tendency (purpura is usually associated with sepsis or viral infection |
| Dehydration and electrolyte imbalances, particularly hypokalemia and severe acidosis |
| Persistent tachycardia, signs of heart failure, or breathing difficulties |
| Severe anemia with clinical signs of hypoxia |
| Clinical jaundice or elevated bilirubin |
| Extensive exudative or exfoliating skin lesions, or deep bed sores |
| Hypoglycemia or hypothermia |
| Very low total serum proteins |

Table 2: Characteristics that indicate poor prognosis in malnourished patients

SOURCE: Waitzberg, 2004.

signs of infection such as fever, inflammation and dyspnea, the clinical manifestations of infection in patients with severe malnutrition can be apathy, drowsiness, hypothermia and/or food refusal.

Due to age-specific characteristics such as greater need for nutrients for growth, limited energy reserves, maturation of organs and systems, and family dependence, children and adolescents are especially vulnerable to malnutrition. The consequences of this nutritional disorder can affect practically all systems, altering various functions, including renal, hepatic, and endocrine, causing imbalances in mineral and energy metabolism, decreasing immune activity, causing healing problems, delaying growth, development sex and modify brain composition and activity, that cause irreversible sequelae to cognitive function. Malnutrition is associated with a poor prognosis in hospitalized patients, as shown in Table 2, and it is possible to identify an increased risk of infections, increased loss of muscle mass, impaired wound healing, longer hospital stay and increased morbidity and mortality. In children, there are still some additional consequences, such as impaired growth and cognitive development, as well as poor school performance (OLIVEIRA et al 2017).

Patients with severe malnutrition must be considered immunodeficient, as their pathophysiological characteristics do not tolerate the administration of large volumes, in addition to requiring micronutrient replacement. For these patients, nutritional therapy must consider the degree of stress when adjusting the caloric needs of macro and micronutrients. At this time, it is necessary to prevent and treat the clinical-metabolic complications that can increase the risk of death, correct specific nutritional deficiencies and start feeding. Since the objective is not to recover the nutritional status of the patient, but to stabilize his clinical-metabolic condition (OLIVEIRA, 2010).

Children who have been malnourished and who have not recovered in height have a higher respiratory quotient than children who have never been malnourished. This means that their body physiologically "desires" to accumulate body fat. A higher respiratory quotient means that the oxidation of fat in the body is lower, so the child will grow less, gain less muscle, less bone, and will tend to use the energy they ingest for fat accumulation. When comparing malnourished girls with girls from a control group in relation to the speed of weight gain, it was found that the malnourished girls had a greater speed of weight gain, due to the decrease in energy expenditure, decreasing the rate of resting metabolism over time. of the growth period. This decrease in energy expenditure for the purpose of gaining weight is associated with an increase in body fat, especially in the waist region, where fat accumulation is more dangerous, as it is strongly associated with chronic diseases such as diabetes and heart disease in adulthood ( SAWAYA, 2006).

Malnutrition damages all of the child's organs and systems. There is an interaction between malnutrition and infection, where there is a potentiation of both, resulting in compromise of the host's immune defenses, caused by malnutrition, facilitating the installation of infectious processes and, on the other hand, infections compromising the nutritional status, causing a vicious cycle ( SILVA and TIENGO, 2014).

The child with severe malnutrition, when hospitalized, is usually apathetic, does not respond to social stimuli, cries easily, is extremely thin, disproportionate and/or presents edema. It has developmental delay as a whole (MONTE, 2000).

## FINAL CONSIDERATIONS

Comparing the results obtained by several researchers, it appears that hospital malnutrition in children is a highly prevalent problem in Brazil and worldwide. The studies show that malnutrition affects patients with different diagnoses and is correlated with a higher risk of clinical complications and longer hospital stay.

Studies show that there are numerous causes of weight loss among hospitalized children, such as: decreased appetite and food intake, increased catabolism due to infection, pain, anxiety, change in eating habits and schedules, and iatrogenics. Since this weight loss can cause damage to all organs and systems of children causing delay in their development.

These facts lead us to reflect on the need to value the nutritional status of hospitalized children. Thus, nutritional assessment is essential to early identify malnourished patients and those at nutritional risk, providing the patient with an adequate nutritional intervention, which can collaborate with the improvement of the prognosis.

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