



Nutritional Therapy in Critically III

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General Note



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ABSTRACT

Introduction: Nutritional therapy has had a major impact on the evolution of the clinical situation on the critical patient as well as the choice of treatment. The oral/enteral feeding is more physiologic and preferable, therefore, whenever possible, should be used the gastrointestinal tract. When this cannot be used, the parenteral is indicated, either supplement or total. **Objective:** The aim of this study is to clarify the importance of the nutritional therapy in critically ill patients. **Material and Methods:** A systematic review of the literature by mobilizing the descriptors "Nutritional Therapy", "Critical Patients" and "Nursing care", use the method peak. Were selected ten databases imaginable, between 2012-2016, included for analysis nine articles. **Results and Discussion:** It was found in most of the studies that malnutrition in hospital environment is highly prevalent and is not always recognized by health professionals. Nutritional support is intended to provide an intake of sufficient energy to feed the patient needs, in order to prevent malnutrition or correct a situation of pre-existing malnutrition. A nutritional approach is, among others, by the institution of enteral nutrition and parenteral nutrition, whose impact on improving the nutritional status of the client is very important in reducing morbidity and mortality. These aspects imply optimizing the balance of protein in reviews of Intensive Care Unit (ICU), as well as an improvement of the energy balance. **Conclusion:** It can be concluded that the treatment of the patient in a critical situation must include nutritional therapy, with the aim of reducing associated complications. After stratified the risks, its necessary to choose the adequate nutritional therapy. This, in a critical patient, can result in a better evolution of the underlying disease with increased survival, improving the quality of life and reduction the time that a patient stays in the hospital.

Keywords: Nutritional Therapy, Critical Patients, Nursing Care

1. INTRODUCTION

The critical patient, due to different aggressions, constitutes a sample not uniform of individuals who require complex care and constant monitoring, which requires usually hospitalization in an Intensive Care Unit (ICU). We already know, from past years, that the critical patients are hypercatabolic and hypermetabolic, and who therefore needs a higher calorie intake. Based on these facts, in the 1970s, was introduced the concept of hyperalimentation. Only at the end of the 1980's, studies that demonstrated an association between hypernutrition and complications such as: hyperglycemia, osmotic diuresis, increased production of CO₂, fatty liver disease and cholestasis (Jeejeebhoy, 2004).

The nutritional status of hospitalized clients has a direct relation in its clinical evolution (Fontoura, Cross, Londero and Vieira; 2006). According to Logan and Hildebrandt (2003), the calorie malnutrition and protein is a prevalent problem, affecting between 30% to 60% of the hospitalized patients. Many of these patients lose weight during hospitalization. This phenomenon has a multifactorial origin.

This problem is even more acute in critical patients, since they present an accentuated hypermetabolism and hypercatabolism (Bermeo et al, 2005; Pirat et al, 2009) and in its medical condition, including the presence of hemodynamic instability and absence, sometimes of a track available, makes it impossible to proceed, in many cases, to an early nutritional support. In addition to the problems of energy consumption can be conditioned by some clinical procedures and pharmacological tests that promote a reduction in the metabolic response. For this reason, the accurate determination of the energy consumption of these patients is mandatory, thereby ensuring their energy needs, avoiding the many harmful consequences associated with hyper or hyponutrition (Rubinson et al, 2004).

Nutritional support is essential in the prevention and treatment of nutritional deficits inherent to clients admitted in the ICU's. The benefits that support reveal, in practice, the decrease in morbidity and mortality of patients. It is, however, required the interaction on the part of the multidisciplinary team and interdisciplinary, to improve the prognosis, and may have an impact on mortality associated with complications of malnutrition.

The current recommendations, with respect to the nutritional support, are, on the one hand, guidelines and/or consensus for the caloric intake to the critical patient, on average, 25 kcal/kg/day or 25-30Kcal/kg/day not in protein and 20-25Kcal/kg/day not protein for women, and on the other hand, in pre-established formulas in the literature, for example the formula of Harris-Benedict, which uses parameters such as the basal metabolic rate, sex, weight, height and age.

The effects of malnutrition on the critical client involve increased risk of complications after surgery, dysfunction of the digestive tract, immune disorders, dysfunction of respiratory muscles (with consequent delay in the wean), difficulty in healing of wounds,

higher incidence and prevalence of pressure ulcers and consequently limiting the prognosis and increased time of hospital stay (Mechanik and Brett, 2005).

2. MATERIALS AND METHODS

A systematic review of the literature is one of the methods of research used in the practice of evidence-based and its purpose is to gather and summarize results of research on a given topic in a systematic and orderly manner, contributing to the knowledge of the theme (Mendes et al., 2008; Benefield, 2003). The method used was based on PICO strategy (acronym for patient, intervention, comparison and "outcomes"). This way it maximizes the inclusion of relevant information in different databases, focusing on the research object and avoiding unnecessary lookups (Santos, Pimenta e Nobre, 2007).

Observing with rigor all steps required in the use of this method, the time interval between May and July of 2016, a protocol was developed for the identification of studies of interest to this work and that consisted of a search in the search engines: Ebsco and B-ONline, and on the following databases: CINAHL Plus, PubMed/ MEDLINE, LILACS, Scielo, Web of Science, ScienceDirect, Cengage Learning, Academia Search Complete, Psychology and Behavioral Sciences Collection, John Wiley & Sons, SportDiscus, The Joanna Briggs Institute, U.S. National Library of Medicine, Directory of Open Access Journals, Springer Science & Business Media and Repository of Scientific Open Access of Portugal.

For the identification of relevant studies a search strategy was used, using the following descriptors Music Therapy AND Critical Patients AND Nursing Care. After meeting all these protocol assumptions, some articles, that did not meet the requirements, were phased out, developing methodically a reductive process.

3. RESULTS

It was selected for the study nine articles that follow in Table 1.

Table 1 Description of selected studies and main results of investigations

Study	Author(s)/ Year	Main Results
E1: "Nutrition support in critically ill patients: An overview"	David Seres, Polly E Parsons, Timothy O Lipman, Geraldine Finlay; 2016.	-This study revealed that the nutritional needs of the critical patient are less understood and vary according to the stage of the disease, being the main goal of nutrition in these reviews to improve the course and outcome of critical illness. -It was possible to conclude that, despite the process of catabolize of critical patient, with better management of bankruptcy, ventilator, fever, anxiety and pain of the client, the consumption of calories, as measured by indirect calorimetry (CI), is significantly reduced. -Demonstrated that despite the carbohydrates are nutrients for the election, a nutrition rich in proteins is the hope for the attenuation of the breakdown of muscle protein, reflecting a favorable balance of nitrogen.
E2: "Metabolic and nutritional support of critically ill patients: consensus and controversies"	Jean-Charles Preiser, Arthur RH van Zanten, Mette M Berger, Gianni Biolo, Michael P Casaer, Gordon S Doig, Richard D Griffiths, Daren K Heyland, Michael Hiesmayr, Gaetano Iapichino, Alessandro Laviano, Claude Pichard, Pierre Singer, Greet Van den Berghe, Jan	-The results of the present study allow us to discuss the amount of calories and protein to ingest, the incidence and management of refeeding syndrome, the importance of monitoring of residual volume of the stomach, the option for feeding supplemental parenteral when power discharged is deemed insufficient, the role of indirect calorimetry and possible indications for various pharmaconutrition. -The consensus of information is directly related to the timely implementation of nutrition on the critical client, since there are no contraindications; the estimate of the energy needed for each patient based on Calorimetry; the need to introduce vitamins in Parenteral Nutrition and application of arginine only patients in outside of the ICU's.

	Wernerman, Paul Wischmeyer, and Jean- Louis Vincent; 2015	-It was possible to conclude that the facts controversial are related with: caloric intake, appropriate supplements to the AP, optimum dose of proteins, appropriate dosing of refeeding syndrome, use of anti-oxidants, use of glutamine, omega-3, high doses of selenium, use of probiotics and monitoring of gastric residue. For all these aspects there are authors who report that they are in favor of its use and others that are not, in accordance with their arguments.
E3: "Nutrition in critically ill patients"	M Sharada and M Vadivelan; 2014	-It was possible to verify, in this study, that malnutrition is a persistent problem in hospitals and in intensive care units around the world. The concept of therapeutic nutrition replaced supportive nutrition in critically ill clients. -It was possible to conclude that, ideally, enteral nutrition should be initiated as early as possible, as well as pro-kinetic agents used to improve the gastric tolerance customers in critical condition. -Noted that the if enteral nutrition is not feasible, it can be administered parenteral nutrition in order to optimize the power requirements of the client; however requires specialized care and strict monitoring. -It was possible to verify that the recent pharmaconutrtrion and hormones are available, but more studies are needed before its routine use.
E4: "Nutrition in the Acute Phase of Critical Illness"	Michael P. Casaer and Greet Van den Berghe; 2014	-The study revealed that the complete replacement of nutrition parenteral by enteral, at the beginning of critical illness, provides no benefit to the patient. -Early parenteral nutrition and parenteral nutrition not further increase the risk of infectious complications. This view can limit the number of nutritional interventions with confidence recommended for daily practice of critical patients. -Verified, from clinical trials in malnourished clients, it seems reasonable to start enteral feeding, providing micronutrients, when the clinical situation of the client is stable. -Reveled that does not seem desirable to interfere with the start of the catabolic response to critical illness or with macronutrients or anabolic hormones. The adverse effect of large quantities of nutrients and growth factors during the acute disease can be explained by its suppressive effects on cellular reaction.
E5: "Terapia Nutricional no Paciente Crítico"	Cristina F. Diestel, Mônica G. Rodrigues, Fernanda M. Pinto, Rachel M. Rocha and Patrícia S. Sá; 2013	-Research shows that nutritional therapy has a positive impact on the evolution of the critical patient; however success depends on other factors, appropriate selection of the access route, the definition of the calorie requirements and the protein of the infusion technique of diet and monitoring of their nutritional therapy. -Also reveals that nutritional therapy should be instituted, preferably by enteric access, in the first 24-48 hours of hospitalization, especially in malnourished clients and/or with intense catabolism or when there is no prediction of initiation of oral intake in 3 to 5 days. -It appears that in relation to the enteral formula, diets with intact protein (polymeric) are appropriate for most patients. The use of oligomeric diets is indicated for clients with persistent diarrhea, after excluding causes that require specific treatment (hyperosmolar

		<p>medications, clostridium difficile).</p> <p>-It is suggested the use of diets with soluble fiber in clients with severe diarrhea, under enteric diet because it can bring benefits, but the insoluble fiber should be avoided in all critical patients.</p> <p>-Refers that the parenteral access should be used after having been exhausted all attempts to use the digestive tube.</p>
E6: "Optimizing energy and protein balance in the ICU"	Peter J.M. Weijsa and Paul E. Wischmeyere; 2013	<p>-This study shows that the in critical patients should be optimized the balance of protein and energy balance, in order to improve the treatment and prognosis.</p> <p>-Conclude that most investigations have focused on providing energy for enteral or parenteral nutrition, and some studies suggest that late onset of power supply could be beneficial. However, other investigations not identify with certainty the answers to when and how the customer should be nurtured.</p> <p>-Reveal that some studies agree on the importance of adequate supply of proteins, 1.2-2.0 g/kg/day, for a better recovery of the client and conclude that in fact, the supply of proteins at an early stage may be more important than the energy supply.</p> <p>-These findings imply that optimizing the balance of protein in patients of ICU, as well as the energy balance can improve the outcomes and decrease the time of hospital stay.</p>
E7: " Parenteral nutrition in critical care"	Kirsten Macdonald, Kevin Page, Lisa Brown and Daniele Bryden; 2013	<p>-It was possible to verify that malnutrition in patients in intensive care is associated with unsatisfactory results.</p> <p>-The beginning of adequate nutritional support should be initiated within 48 h from admission to the ICU.</p> <p>-It appears that nutrition discharged should be the first to be used but due to many factors, there is often a need to use the supply parenteral.</p> <p>-The Parental nutrition must be individualized for the client, based on their state of health, physiological needs and should involve a multidisciplinary approach.</p>
E8: "Necessidades nutricionais do doente crítico"	Nuno André de Almeida Costa, Aníbal Defensor Marinho and Luciana Ribeiro Cançado; 2012	<p>-In this study we evaluated 85 patients through the completion of 288 measurements by indirect calorimetry. The values obtained for the energy needs in different methods are: by indirect calorimetry 1,753,98±391.13 kcal per day and the equation of Harris-Benedict 1,504,11±266.99 kcal per day.</p> <p>-It was possible to conclude that the equation of Harris-Benedict is not accurate in determining energy expenditure, underestimating it and showing significant differences to predict, at the individual level, the energy expenditure.</p> <p>-In Indirect calorimetry, which is recognized as the reference method for the measurement of energy expenditure in critical patients ventilated, the limitations that accompany it induces the use of formulas, such as the equation of Harris-Benedict and most common methods to estimate the actual energy expenditure in clinical practice.</p> <p>-Results, despite its limitations, confirm the need to develop or improve methods to predict energy expenditure more used and confirm that the indirect calorimetry remains as a most reliable method for its determination.</p>
E9: "Nutrition in	Ramanathan Ramprasad	-It was possible to verify that parenteral nutrition is indicated only

intensive care”

and Mukul Chandra
Kapoor; 2012

when the power discharged is contraindicated.

-The recommendations for the early parenteral nutrition clients, where enteral nutrition is contraindicated range of 3 to 7 days at various orientations.

-The study shows that today the malnutrition is consistently common among patients in the context of the ICU in all over the world. There is a need to emphasize that the nutritional support to critical patients is a strategy of primary therapy. The increase in the survival of patients in a critical situation was made possible by improving the understanding of the requirements of nutrition and techniques to provide nutrients.

-Emphasize the importance of using the prokinetics in clients who suffer from intolerance of food (which wastes high gastric and/or vomiting), to improve gastric emptying and intestinal motility. The nutrition discharged must be administered with the head of the bed elevated at 45° to reduce the risk of aspiration and decrease the incidence of ventilator-associated pneumonia.

4. DISCUSSION

The studies found on this theme being the majority of the studies (E1, E2, E3, E7 and E9) recognize that malnutrition in clients admitted in intensive care units is associated with insufficient outcomes in terms of mortality and morbidity, and the nutritional needs of the patient in a critical state is poorly understood, because the main objective of nutrition in these clients is to improve outcomes of critical illness, facts which corroborate with Berry (2013) and Rajendram et al. (2015).

The Studies E1, E4, E5, E6 and E9 shows that despite the process of catabolize of critical patient, with better management of ventilatory bankruptcy, control of fever, anxiety and pain, the calorie consumption is considerably reduced, providing increased survival of patients in a critical situation, by improving the understanding of the requirements of nutrition and techniques to provide nutrients, aspects which corroborate with Berry (2013) and Rajendram et al. (2015). The nutrition of adjustment causes a decrease in muscle function, respiratory and immune and acts negatively in treatment and wound healing, increasing the surgical complications, the risk of infection, the duration of ventilation, the time and cost of hospitalization. The caloric intake should meet the minimum requirements of the patient and the minerals, vitamins and water should be adjusted to the needs and the clinical (Valongo, 2013; Rajendram et al., 2015), facts that agree with the same studies.

It is evident that nutrition discharged should be started as early as possible on the client in a critical situation, in which there are no contraindications, preferably between 24 to 48 hours after admission and must be estimated the power required for each patient (Griffiths and Bongers, 2005; Berry, 2013). These facts were shown in studies E2, E3, E5 and E7. The parenteral nutrition is indicated only when the power discharged is contraindicated and needs to be individualized for the client in accordance with the pathology and shortcomings in question (Griffiths and Bongers, 2005; Berry, 2013), such as underlined in the studies E2, E3, E7 and E9. However, in spite of controversial, the study E4 showed that in some studies do not generate unequivocal evidence that the supply of complete replacement, early in the course of critical illness, could result in benefits to the patient. It also reveals that the supply early parenteral and nutrition supplemental parenteral does not increase the risk of complications infectious. The study E6 is also controversial, because cites studies suggesting that the late start of the power supply could be beneficial. Other investigations identify with certainty the answer to when and how the patient should be fed.

Regarding the enteral formula diets with intact protein (polymeric) are suitable for most clients. The use of oligomeric diets is indicated to clients with persistent diarrhea, after exclusion of causes that require special treatment (Kreymann et al., 2006; Berry, 2013), as enhance studies E1, E5 and E6. The study E5 reveals that the use of diets with soluble fiber in clients with severe diarrhea, under enteric diet, can bring benefits, but the insoluble fiber should be avoided in all critical patients.

The malnutrition is a frequent problem to a critical client, since there is an increase of energy-protein needs inherent to the disease and metabolic disorders. This increase should be accompanied by an adequate intake of nutrients, not only macronutrients and micronutrients, but also functional substrates, appointed by pharmaconutrition, such as glutamine, some vitamins and antioxidants elements. These allow treatment and prevention or mitigation of malnutrition, as this can have a severe negative effect

on the prognosis of critical customer, with consequent increase in morbidity and mortality (Gonçalves, 2010). These aspects are consistent with the findings of studies E2, E3 and E9, however the study E3 (even though there are necessary more studies before taking on its use on a routine basis) refers the possibility of having pharmaconutrition or specific elements in the nutrition of clients in a critical situation.

As for the formula for calculating the nutritional needs of the patient, indirect calorimetry, recognized as the reference method for the measurement of energy expenditure in critical patients vented (Kreymann et al, 2006), as stated in the study E8, concluded that the equation of Harris-Benedict is not accurate in determining energy expenditure, underestimating it and showing significant differences to predict, at the individual level, the energy expenditure.

5. CONCLUSION

In relation to the results of the studies analyzed, it can be noticed that this study highlights the difficulty that exists to provide an adequate nutritional support to clients admitted to the ICU's. At an early stage of hospitalization, period in which it is vital to restore hemodynamic status, it should relegate to the background the proper calorie intake; at a more advanced stage is very important its strict control. The treatment of the patient in a critical situation must include nutritional therapy, since patients are at high risk of complications.

After stratified the risks, it is important to choose the best nutritional therapy. This, on the client in a critical situation, can result in a better evolution of the underlying disease with increased survival and shorter hospital stay. It is worth noting that the oral feed is always preferable and that the indication of nutrition parenteral should not be delayed in appropriate cases.

The use of nutrients with the purpose of improving the immune function, it is becoming increasingly common, but its use is not well established for patients in a critical situation, suggesting that the more clinical studies are needed to establish the best way to nourish the patient in a critical condition.

The nutritional assessment at the time of hospital admission is crucial and should not be neglected by professionals and health systems, because it allows correcting the existing malnutrition and prevent the worsening of nutritional status during hospitalization, enabling the improvement of clinical outcomes and lower costs.

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