

Achieving The Nutritional Goal Of Burn Patients In A Referral Hospital In The Northern Region Of Brazil

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Abstract:

Background: Burns represent a significant health challenge, not only due to the pain and suffering they cause, but also due to metabolic complications. Oral nutritional therapy is a powerful tool in the recovery of these patients, as the burn requires double the energy demands. Therefore, achieving the nutritional goal in burn patients should be considered a priority in clinical management.

Materials and Methods: Patients admitted to the Burn Treatment Center at a reference hospital in the North region were evaluated. For nutritional diagnosis, the gold standard tools for nutritional risk analysis were applied, Nutritional Risk Screening (NRS-2002) for adults and Screening Tool for Risk on Nutritional Status and Growth (Strongkids, 2012) for children. These are validated low-cost and non-invasive methods. Monitoring the achievement of VET and protein was carried out through food records and the percentages achieved in accordance with the prescribed calories and proteins were calculated.

Results: 22 adult patients were evaluated. Of these, 15 men and 7 women, with an average age of 35.8 years. The assessment revealed 7% malnourished, 67% eutrophic, 33% obese and 13% obese. Adults averaged 2026 cal/day with 112% VET attainment and 90g protein with 125% intake. It is worth highlighting the joint action of nutrition professionals with the prescription of hypercaloric and hyperprotein preparations to adapt to the needs recommended for burn patients, in addition to Oral Nutritional Therapy (ONT), with an increase of 600cal/day and 40g of proteins. The use of hypercaloric and hyperprotein supplementation in burn patients is a strong ally in diet therapy, given the catabolic state and high risk of depletion. Among the children's audience, 7 children were served: 4 boys and 3 girls, an average age of 4.4 years. The nutritional diagnosis showed 85% in eutrophy, and 15% in nutritional risk. The VET of this group was on average 1215 cal and 39g of protein. Children achieved an average of 142% of daily VET and 175% of protein needs. To this end, 85% used TNO, accounting for 300 cal and 7.6 g of additional protein to the oral diet.

Conclusion: Achieving the nutritional goals prescribed for burn patients has a significant impact on the effectiveness of treatment.

Key Word: Hypercatabolism, Supplementation, Nutritional Assessment.

Date of submission: 19-10-2024

Date of acceptance: 29-10-2024

I. Introduction

Burns represent a significant challenge in healthcare, not only due to the pain and suffering they cause, but also due to metabolic complications¹. It is estimated that there are 300,000 deaths from burns worldwide² and in Brazil, more than one million people are affected by incidents involving burns each year). Epidemiologically, young adults are the most affected, followed by children and the elderly³.

One of the main pathophysiological characteristics in burns is hypercatabolism, which triggers increased energy and protein demands. Therefore, the burn patient is critical and needs a careful and structured nutritional approach. This metabolic response intensifies nutrient needs, essential for the recovery of damaged tissue and the maintenance of the body's vital functions⁴.

Early nutrition is essential to mitigate the consequences of hypercatabolism. Nutritional intervention should be started as soon as possible as the patient stabilizes, preferably within the first 24 hours, to reduce the immunological response, in addition to recovery time and associated complications⁵.

Oral nutritional therapy is a powerful tool in the recovery of these patients, as the burn requires at least 40% more energy demands and 2x more protein. This approach not only provides the necessary nutrients, but also helps restore muscle mass and tissue integrity, promoting more efficient healing⁶.

Therefore, analyzing the achievement of nutritional goals in burn patients with a preserved oral route should be considered a priority in clinical management. Since it is a critical component in tissue recovery and improving prognosis. In summary, the integration of effective nutritional strategies can transform the recovery process, emphasizing the importance of treatment that considers not only the physical aspects of the burn, but also the patient's nutritional needs.

II. Material And Methods

Patients admitted from June to July 2020 at the Burn Treatment Center at a reference hospital in the North region were evaluated. The inclusion criteria adopted required that patients be receiving oral medication exclusively. Exclusion criteria include patients with no indication of starting an oral diet, using an enteral and/or parenteral diet.

Patients were nutritionally diagnosed by applying the gold standard tools for analyzing nutritional risk for adults, the Nutritional Risk Screening questionnaire (NRS-2002) 7 and for children, the Screening Tool for Risk on Nutritional Status and Growth questionnaire (Strongkids, 2012)⁸. These are validated low-cost and non-invasive methods.

To monitor the achievement of Total Energy Value and the amount of protein ingested, food records were carried out daily for the last 24 hours and the percentages achieved were calculated in accordance with the calories and proteins prescribed by nutritionists. The data were tabulated and analyzed using @excel software.

All patients were informed of the research, and invited to participate and sign the consent form. The research is registered with the institution's Ethics and Research Committee under registration no. 022/2009.

III. Result

During this period, 22 adult patients were included and evaluated. Of these, 15 men and 7 women, with an average age of 35.8 years.

The nutritional assessment revealed 7% diagnosed with malnutrition, 67% with normal weight, 33% with overweight and 13% with obesity.

In relation to achieving energy goals, adults had an average daily caloric intake of 2026 cal/day, resulting in an average of 112% achievement of Total Energy Value when compared to the nutritional prescription. In the analysis of protein intake, an average supply of 90g of protein per day was observed, corresponding to 125% above the prescribed amount.

Among the children's audience, 7 children were served: 4 males and 3 females, with an average age of 4.4 years. The nutritional diagnosis of the children showed 85% of them at normal weight, and 15% at nutritional risk. The average Total Energy Value ingested by this group was 1215 calories and 39g of protein per day. Pediatric patients achieved an average of 142% of daily VET and 175% of protein requirements.

The use of oral nutritional therapy was accepted by 85% of patients, who received an additional 600 cal and 40 g of protein per oral diet for adults and 300 cal and 7.6 g of protein for children.

IV. Discussion

The most cited causes of burns are flames, contact with boiling liquids, contact with heated objects and those caused by electric current⁹. And men were the most affected, as in studies carried out in other countries, more than 70% of the public affected by severe burns are male¹⁰.

The most prevalent nutritional diagnosis was eutrophy, which is in agreement with the Food and Nutritional Situation Panel in Brazil¹¹, which shows that 36% of adults in the North region followed up in Primary Health Care are eutrophic and 24.5% are eutrophic. were obese.

Early initiation of the oral diet in patients with severe burns is a major challenge in the nutritionist's practice, due to patient disorientation, impaired lung function, gastrointestinal dysfunction and food intolerances¹². However, the use of hypercaloric and hyperprotein supplementation in the patients in the present study proved to be a strong ally in achieving the diet therapy goal. Considering the catabolic state, high risk of nutritional depletion and the complications caused by the analgesia protocols, dressings and nausea due to polypharmacy to which patients were subjected daily. It is also worth highlighting the joint action of nutrition professionals at the hospital referred to for the study, who were prescribed hypercaloric and hyperprotein preparations with a specific menu for this group, adapting to the needs recommended for burn patients.

Burns promote a state of hypermetabolism, which generates an inflammatory cascade, linked to a caloric deficit that predisposes to sepsis, which is a risk factor for patient morbidity and mortality. Due to these pathophysiological changes in the burned tissue, the patient presents a marked decline in lean mass, with a high prevalence of hospital malnutrition. Protein loss also occurs through wound exudates¹³.

Diet therapy in critically ill burned patients focuses on a hypercaloric and hyperprotein supply, due to the systemic inflammatory response and its complications. Carbohydrate is fuel for effective healing of burned tissues. A lack of this nutrient can result in harm such as the degradation of muscle and adipose tissue for the

use of energy, increasing gluconeogenesis and consequent oxidative stress, worsening the patient's clinical and nutritional status. Thus, the importance of achieving caloric and protein goals above 100% in all patients treated stands out in this study, since the deficiency of antioxidant macro- and micronutrients after burns is strongly linked to a poor prognosis, with increased length of stay and compromised post-discharge rehabilitation¹⁴.

However, a contribution far beyond what is necessary can cause hyperglycemia, which can contribute to an increase in the rate of infections and mortality¹⁵. Based on this aspect, patients' blood glucose levels were monitored as part of the service's routine and adjustments were made as necessary, since strict blood glucose control reduces mortality in up to 34% of cases¹⁶.

Regarding protein goals, all patients achieved the prescribed goals. This prescription for critically ill patients with burns followed the guidelines of the European Society of Clinical Nutrition and Metabolism (ESPEN), which recommends the intake of 1.5 to 2.5g/kg/day of protein⁵. It is known that protein depletion prolongs the inflammatory phase because it affects the entire healing cascade, such as decreased collagen synthesis and deposition, inhibits fibroblast proliferation, decreases the tensile strength of the wound, limits the phagocytic capacity of leukocytes and increases the rate of wound infection, inhibits angiogenesis and inhibits wound remodeling. It is extremely important that protein intake is accompanied by a good energy intake, which was proven in this research. In case of insufficient carbohydrate intake, muscle protein reserves generate energy for the body, but with high renal overload. The recommendation is a high-protein diet due to protein catabolism, urinary loss, neoglucogenesis and the healing process, with the aim of ensuring a positive nitrogen balance¹⁷.

The combination of lipids and glucose can be an effective strategy to meet the energy needs of burn patients, contributing to a better nitrogen balance and providing essential fatty acids. Lipid recommendations can range from 20 to 30% of total daily calories, as they play a crucial role in wound cellular function, helping to reduce inflammation and promoting remodeling of affected tissues, which in turn assists in the production of collagen and extracellular matrix¹⁵.

In relation to the pediatric public, there was also success in ingesting the prescribed nutrients. In burned children, nutritional therapy plays a crucial role in recovery, as it provides the nutrients necessary for adequate wound healing and the regeneration of damaged tissues. Adequate nutrition also helps maintain the energy necessary to withstand the physical stress that the burn imposes on the body¹⁸.

In addition to promoting healing, nutritional therapy is also essential for the healthy growth and development of children. The children in the study had boosted immune systems, making them less susceptible to infections, which are a significant risk after burns. With a careful nutritional approach, it is possible to ensure that children not only recover physically, but also reach their maximum development potential, promoting recovery and improving quality of life in the long term¹⁸.

V. Conclusion

Monitoring the achievement of energy and protein nutritional goals prescribed for burn patients has a significant impact on the effectiveness of treatment. Highlighting that the patients had a high intake and received high-quality proteins from Oral Nutritional Therapy, which, combined with diet, attenuate the metabolic response to trauma. Therefore, the binomial early nutritional diagnosis/early intervention reduces hospitalization time and nutritionally iatrogenic actions.

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