

DOI: <https://doi.org/10.36489/saudecoletiva.2020v10i59p4140-4151>

Nutritional management for hospitalized patients with COVID-19: an integrative review

Manejo nutricional para pacientes hospitalizados con COVID-19: una revisión integradora

Manejo nutricional para pacientes hospitalizados com COVID-19: Uma revisão integrativa

ABSTRACT

The aim of this study is to describe the nutritional therapy adopted in the care of patients hospitalized with COVID-19. This work is an integrative literature review. The data were searched in databases and portals. It was found that the authors recommend carrying out nutritional risk screening. In addition, it was found that the ideal is the use of Enteral nutritional therapy, using a standard isosmotic polymeric diet and use of protein between 1.2-2.0 g / Kg / day. The presence of the Multidisciplinary Team in Nutritional Therapy is essential in the treatment and recovery of patients with COVID-19.

DESCRIPTORS: COVID-19; nutritional recommendations; and nutritional therapy.

RESUMEN

El objetivo de este estudio es describir la terapia nutricional adoptada en el cuidado de los pacientes hospitalizados con COVID-19. Este trabajo es una revisión integradora de la literatura. Los datos se buscaron en bases de datos y portales. Se encontró que los autores recomiendan realizar un cribado de riesgo nutricional. Además, se encontró que lo ideal es el uso de terapia nutricional enteral, utilizando una dieta polimérica isosmótica estándar y uso de proteína entre 1.2-2.0 g/Kg/día. La presencia del Equipo Multidisciplinario en Terapia Nutricional es fundamental en el tratamiento y recuperación de los pacientes con COVID-19.

DESCRIPTORES: COVID-19; recomendaciones nutricionales; y terapia nutricional.

RESUMO

O objetivo deste estudo é descrever a terapia nutricional adotada no cuidado aos pacientes hospitalizados com COVID-19. Este trabalho é uma revisão bibliográfica integrativa. Os dados foram buscados em bases de dados e portais. Verificou-se que os autores recomendam a realização da triagem de risco nutricional. Além disso, constatou-se que o ideal é o uso de terapia nutricional Enteral, utilizando-se uma dieta polimérica isosmótica padrão e uso de proteína entre 1,2-2,0 g/Kg/dia. A presença da Equipe Multidisciplinar em Terapia Nutricional é fundamental no tratamento e recuperação dos pacientes com COVID-19.

DESCRIPTORES: COVID-19; recomendações nutricionais; e terapia nutricional.

RECEIVED ON: 09/30/2020 APPROVED ON: 10/14/2020

Daniela Corrêa Ferreira

Graduated in Nutrition from the Federal University of Ouro Preto, specialist in Clinical Nutrition from the University Veiga de Almeida. Master and PhD in Food Science from the Federal University of Minas Gerais. Adjunct Professor at the Department of Nutrition at the Federal University of Juiz de Fora - Campus Governador Valadares.

ORCID: 0000-0002-1480-2974

Deysimara Cássia Santos

Student of the Nutrition course at the Federal University of Juiz de Fora, Fellow of the Education through Work Program for Pet / Health Health - UFJF- GV / SMS-GV Interprofessional, Monitor of the discipline "Management of Food Unit I" and member of the Multiprofessional Academic League for Child Health Promotion.

ORCID: 0000-0001-7472-9222

Maisa Pereira Vieira

Nutrition Student at the Federal University of Juiz de Fora, member of the research group Nucleus for the Study of the Elderly. Extensionist in the "Action, Citizenship, Youth and Community" project - Tourmaline (Boa Vizinhança Program - Rio Doce) is also a member of the Multiprofessional Academic League for the Promotion of Child Health, Scholarship holder in the Extension project Intervention strategies for active aging in the community - Operative group to support sustainable weight loss and nutrition

ORCID: 0000-0003-1127-9353

Natália da Cunha Severino Sampaio

Graduated in Nursing from the Pontifical Catholic University of Minas Gerais. Post-graduation in Nursing in Intensive Care from the Pontifical Catholic University of Minas Gerais. Post-graduation in Nursing in Intensive Care from the Pontifical Catholic University of Minas Gerais. She is currently a nurse at the EMTN and the Palliative Care Team and a member of the Patient Safety Center at the Eduardo de Menezes Hospital (FHEMIG).

ORCID: 0000-0002-5799-8006

Simonton Silveira de Andrade

Graduated in Nutrition from the Federal University of Ouro Preto. Master in Biological Sciences (Physiology and Pharmacology) from the Federal University of Minas Gerais and PhD in Biological Sciences (Physiology) from the Federal University of Minas Gerais. Associate Professor of the Nutrition Department from the Federal University of Juiz de Fora - Campus Governador Valadares.

ORCID: 0000-0003-3177-9611

INTRODUCTION

CCOVID-19 is a disease caused by a new strain of a virus in the family Coronaviridae¹ known as pandemic respiratory syndrome associated with the new coronavirus (SARS-CoV-2), whose main forms of transmission are droplets and aerosols.² Generally, patients develop respiratory diseases with signs and symptoms such as: cough, nasal secretions, dyspnoea, fever, myalgia and, in more severe cases, difficulty breathing after the average incubation period of three to seven days (range 2 to 14) days.³

The disease can be classified into different stages: stage 1, in which the virus infects the host, multiplies and begins to affect the lungs, being characterized by clinical signs such as: fever, pneumonia, dry cough and headache, and may even lead to hematological, neurological, gastrointestinal and metabolic changes, especially in critically ill patients. The Center for Disease Prevention Control reports common symptoms such as anosmia and dysgeusia⁴. Stage 2 is characterized by clinical symptoms of shortness of breath, hypoxia and signs of abnormal chest imaging. Stage 3 is characterized by clinical symptoms of acute respiratory distress syndrome, systemic inflammatory response syndro-

me, shock, heart failure or multiple organ dysfunction, both of which are marked by hyperinflammation, cytokine storm and death if not controlled.³

It is estimated that approximately 20% of infected patients may have symptoms severe enough to require hospitalization, of which 5% are in critical condition and require an intensive care unit (ICU), with the majority (75%) requiring mechanical ventilation.² Early identification and timely treatment of critical cases of COVID-19 are of crucial importance, as there are still no drugs with proven efficacy that specifically target SARS-CoV-2.⁵

Recent studies have highlighted the influence of COVID-19 on nutritional status and nutrient intake in infected patients, in addition, when compared to healthy people, it appears that they have increased energy expenditure and a higher risk of malnutrition. Therefore, the lack of adequate supply of nutritional support can increase the length of hospital stay and the incidence of complications. However, overfeeding has been associated with complications such as hyperglycemia, hypertriglyceridemia, hepatic steatosis and increased mortality rate.³ Therefore, the adequate supply of nutrients deserves to be highlighted and must be observed to minimize harmful health effects.

The nutritional status can be compromised by SARS-CoV-2, thus, hospitalized patients who were contaminated with the virus, tend to present nutritional risk at the time of hospitalization, since they have increased energy expenditure. Thus, the maintenance of nutritional status is an integral component of measures in the management of infectious diseases.⁷ Therefore, the objective of this study is to describe the nutritional therapy adopted in the care of patients hospitalized with COVID-19.

METHOD

This study is an integrative literature review. PVO method, population, variables and outcome, respectively, were used as search strategy. Therefore, P are the patients with COVID-19, V the nutritional conduct adopted and O, the maintenance and / or recovery of nutritional status. Thus, we sought to study the factors associated with nutritional management in patients hospitalized with COVID-19, emphasizing the importance of choosing the best therapeutic plan through nutritional therapy.

The bibliographic survey was carried out over the internet from the databases and portals: LILACS, SciELO, Clini-

calTrials.gov, PubMed, CAPES journals and the Virtual Health Library. The descriptors used to search for the articles were: COVID-19; Nutritional recommendations and Nutritional Therapy, as well as their respective synonyms in English. The inclusion criteria adopted were based on articles published in the last 8 months, presence of at least one of the mentioned descriptors and studies carried out in adults. Review articles that did not meet the aforementioned criteria were excluded.

Initially, 24 articles were selected and after analysis, a total of 12 articles were used to elucidate nutritional therapy recommendations in patients hospitalized with COVID-19.

RESULTS

Patients with COVID-19 must be assisted by a multidisciplinary team composed of doctors, nurses, nutritionists, pharmacists, physiotherapists and speech therapists, it is emphasized that other professionals are needed to support family members. In addition, it was shown that 69,2% of the authors performed and recommended that nutritional risk screening be performed for patients with COVID-19, the most used instrument (50%) being the Nutritional Risk Screening (NRS-2002), followed by the modified Nutrition Risk in the Critical Ill (NUTRIC) (33,3%). The modified NUTRIC was chosen over its original version, due to the difficulty in obtaining IL-6 in clinical practice.⁷ Some articles

Patients with COVID-19 must be assisted by a multidisciplinary team composed of doctors, nurses, nutritionists, pharmacists, physiotherapists and speech therapists, it is emphasized that other professionals are needed to support family members.

recommended the use of other tools complementary to screening, such as: the Subjective Global Assessment (16,7%)

and the Global Leadership Initiative on Malnutrition (16,7%).

Regarding nutritional management, 83,3% of the authors recommended the use of Enteral Nutritional Therapy (Terapia Nutricional Enteral - TNE), which started within 24-36h (16,7%) or 24-48h (25%) after admission to the ICU using a nasogastric tube in a post-pyloric position (75%) with a 10-12 french tube (16,7%). In cases where there was a need for mechanical ventilation, it was recommended to start NET within 12 hours after intubation. The other studies recommended the use of oral supplementation (8,3%) after hospital admission with 20g/day of whey protein, followed by parenteral nutrition in a central position (8,3%) for a period of 18-24 h a day after respiratory worsening (pre-ICU). 16,7% of the studies indicated the use of the five-step method: diet + nutritional education, oral nutritional supplement, enteral nutrition (EN), supplemental parenteral nutrition and total parenteral nutrition.

Only 16,7% of the studies defined the composition of the diet used, adopting a standard isosmotic polymeric diet. In addition, 33,3% of the studies indicated the use of low calorie diets (15-20 kcal/Kg/day) and protein use between 1,2-2,0 g/Kg/day (41,6%). The others recommended normocaloric diets (41,6%) or estimated energy needs using the Harris-Benedict formula (8,3%) and protein between 1,0-1,5 g/kg/day (33,3%). The results are shown in table 1.

Table 1 – Characteristics of studies on nutritional therapy at COVID 19.

Instrumento de triagem	Dieta	Início da terapia	Fórmula da dieta	Conduta nutricional	Posição/sonda	Infusão	Autor
-	NE	24-36h após admissão em UTI ou até 12 h após a intubação	Polimérica isosmótica padrão, progredindo para fórmula de fibra mista.	15-20 kcal/kg/dia 1,2-2,0g pt/kg/dia	Nasogástrica/ Pós pilórica	Bomba de infusão contínua	Patel et al., 2020.
NRS-2002 / NUTRIC modificada	NE	24-48h após a admissão em UTI ou o mais precocemente após a intubação.	-	25-30kcal/kg/dia e 1,2-2,0g pt/kg/dia	Nasogástrica/ Pós pilórica	-	Shang et al. 2020.

-	NE	24-36h após a admissão na UTI ou em de 12 horas após a intubação.	Fórmula enteral iso-osmótica polimérica hiperproteica (≥20% de proteína) na fase aguda.	15-20kcal /kg/dia 1,2-2g pt/ kg / dia	Orogástrica ou Nasogástrica	Bomba de infusão contínua	Martindale, et al. 2020.
NRS-2002	NE	-	-	27-30kcal/kg/dia e 1-1,5g pt / Kg/dia	Nasogástrica	-	Brugliera et al. 2020.
NRS-2002	SO	-	-	Utilizar equação de Harris-Benedict	Infusão central (se disponível) ou periférica	-	Caccialanza et al., 2020.
	-	-	-	dieta + educação nutricional, ONS, alimentação por sonda, NPS e NPT .	-	-	Laviano et al., 2020.
NRS - 2002 ou NUTRIC modificada	NE	24-48h após a admissão em UTI ou após intubação	-	Meta de 30 kcal/kg/dia - Iniciar com dieta hipocalórica, e progredir até hipercalórica e 1,3-1,5g pt/kg /dia	-	-	Gupta et al. 2020.
NRS-200, ASG, MAN, NUTRIC e GLIM	NE, se não atender, iniciar NP	-	-	Calorimetria indireta ou dieta hipocalórica 20 kcal/kg/dia 1,3g pt/kg dia	Nasogástrica/ Pós pilórica	-	Barazzoni, et al. 2020
NRS-2002 NUTRIC	NE	24-48h	-	20-30 Kcal/Kg/dia 1,2-2,0g pt/ Kg/dia	Nasogástrica/ Pós pilórica	-	Qiu Haibo et al., 2020.
-	NE	-	-	-	Nasogástrica ou Nasoje-junal	Bomba de alimentação enteral	Anderson et al., 2020.
SGA ou GLIM	-	-	-	Dieta + educação nutricional 20-30 Kcal/ Kg/dia 1,0-2,0g pt/ Kg/dia	-	-	Yu Kaiying et al., 2020.
DEVE, MST, MAN, [MNA-SF]	NE	Até 24h após admissão	-	25 a 30 Kcal/ kg/dia e 1,2g/ ptn/kg/dia	Nasogástrica ou Pós-pilórica	-	Chapple, et al.2020

DISCUSSION

Nutritional therapy is an integral component of measures to care for and support critical illnesses. The disease has phases and includes an initial acute phase, the immediate post-acute phase and the recovery period.⁶ Nutritional therapy

is an integral component of measures to care for and support critical illnesses. The disease has phases and includes an initial acute phase, the immediate post-acute phase and the recovery period.¹⁹

It is noteworthy the recommendation regarding the screening of nutritional risk (69%), recognized by the

Ministry of Health, which aims to identify nutritional risk, ensuring a quick and quality assessment, directing the nutritional therapy team. 20;19 Prevention, early diagnosis and treatment of malnutrition should be included regularly in the management of patients with COVID-19.^{11;21}

NRS 2002 was the most used instrument (50%) to perform risk screening. According to the literature, when compared to different nutritional screening tools, NRS-2002 proved to be superior in identifying the risk of malnutrition during acute illness.²² In addition, this is a method based on indications of nutritional therapy related to nutritional status and increased nutritional needs in the face of the installed disease.²⁰ Preceded by NRS 2002, the modified NUTRIC was the second most used instrument, since it was developed specifically for ICU patients, thus being more specific for identifying the nutritional risk in these patients.²³ The criterion adopted to choose NRS 2002 or NUTRIC should be the severity of the patient²⁴, the second is more recommended for critically ill patients.²³ It should also be noted that, for elderly patients, the MAN method has better specificity and sensitivity.²⁵

In relation to nutritional management, 83.3% of the authors recommended the use of TNE, which started in a period of 24-48 (25%) or 24-36 h (16.7%) after admission to the ICU. The intensive care patient is often in a hypercatabolic state, due to trauma, sepsis or any other serious condition, so the nutritional support for such patients can be decisive in their evolution, as NT seeks to prevent the deterioration of the nutritional status, in addition to minimizing complications due to prolonged fasting.²³

According to the opinion of the Brazilian Society of Parenteral and Enteral Nutrition, oral feeding is preferred in non-serious patients diagnosed with COVID-19, including the use of oral supplements when the estimated energy intake is <60% of nutritional needs.²⁶ However, in critically ill patients, NE is the preferred route and it is suggested that it be started within²⁴⁻⁴⁸ hours, which also corroborates European and American intensive care guidelines.^{27;28;29;30}

Regarding the energy recommendation, 33,3% of the studies indicated the

...patients in serious condition and with compromised nutritional status, should be evaluated according to the recommendations for critically ill patients, since their nutritional status is similar to that of patients with severe respiratory diseases. Thus, the evolution in the supply of energy needs must occur slowly, aiming at patient safety and avoiding a possible refeeding syndrome.

use of low calorie diets (15-20 Kcal/Kg/day) and use of protein between 1,2-2,0 g/Kg/day (41,6%). The others recommended normocaloric diets (41,6%) or estimated energy needs using the Harris-Benedict formula (8,3%) and protein between 1,0-1,5 g/kg/day (33,3%). Due to the hypercatabolic status of these patients and the risk of muscle atrophy¹⁴, higher protein contents are indicated, mainly, containing branched chain amino acids to promote greater protein synthesis.⁹

In patients hospitalized at the onset of the disease who have adequate nutritional status, it is recommended to introduce low-calorie diets in the first weeks of hospitalization³¹, avoiding overfeeding. However, patients in serious condition and with compromised nutritional status, should be evaluated according to the recommendations for critically ill patients, since their nutritional status is similar to that of patients with severe respiratory diseases. Thus, the evolution in the supply of energy needs must occur slowly, aiming at patient safety and avoiding a possible refeeding syndrome.⁶

CONCLUSION

It is concluded that the participation of the Multidisciplinary Team in Nutritional Therapy is fundamental in the treatment and recovery of patients with COVID-19. The identification of nutritional risk in the first hours of hospitalization and assertive nutritional intervention, directly contribute to the favorable outcome of this pandemic disease. This is justified, since the disease can be harmful to the nutritional status of patients, in addition to increasing the length of hospital stay, the risk of complications and health costs. In addition, it is noteworthy that those patients who require mechanical breathing are unable to feed orally, requiring enteral / parenteral nutrition, otherwise some situations of dehospitalization may require assistance, for the complete restoration of health status.■

REFERENCES

- Gorbalenya, A. E. et al. The species Severe acute respiratory syndrome-related coronavirus: classifying 2019-nCoV and naming it SARS-CoV-2. *Nature Microbiology*, [S. l.], v. 5, n. 4, p. 536–544, 2020.
- Patel, J. J.; Martindale, R. G.; McClave, S. A. Relevant Nutrition Therapy in COVID-19 and the Constraints On Its Delivery by a Unique Disease Process. v. 0, n. 0, 2020.
- Gupta, L.; Jalan'o, G. A.; Gupta, P. Nutritional management and support in COVID-19: Emerging nutrivi-gilance. *JPMA. The Journal of the Pakistan Medical Association*, v. 70 3), n. 5, p. S124–S130, 2020.
- Samaranayake, L. P.; Fakhruddin, K. S.; Panduwauala, C. Início súbito, perda aguda do paladar e do olfato na doença coronavírus 2019 (COVID-19): uma revisão sistemática. *Acta Odontologica Scandinavica*, v. 78, n. 6, pág. 467-473, 2020.
- Li et al. Therapeutic strategies for critically ill patients with COVID-19. *Ann. Intensive Care*, v. 10, n. 45, 2020.
- Fernández-Quintela, A. et al. Key Aspects in Nutritional Management of COVID-19 Patients. *Journal of Clinical Medicine*, v. 9, n. 8, p. 2589, 2020.
- Oliveira, M. L. et al. Complementariedade do escore NUTRIC modificado com ou sem proteína C-reativa e avaliação subjetiva global na predição de mortalidade em pacientes críticos. *Revista brasileira de terapia intensiva: São Paulo*, v. 31, n. 4, Jan 20, 2020.
- Laviano, A.; Koverech, A.; Zanetti, M. Nutrition support in the time of SARS-CoV-2 (COVID-19). *Nutrition Elsevier Inc.*, 1 Jun. 2020.
- Shang, Y.; Pan, C.; YANG, X. et al. Management of critically ill patients with COVID-19 in ICU: statement from front-line intensive care experts in Wuhan, China. *Ann. Intensive Care*, v. 10, N. 73, 2020.
- Martindale, R. et al. Nutrition Therapy in Critically Ill Patients With Coronavirus Disease 2019. *Journal of Parenteral and Enteral Nutrition*, v. 0, n.0, 2020.
- Brugliera, L. et al. Nutritional management of COVID-19 patients in a rehabilitation unit. *European Journal of Clinical Nutrition*, v. 74, n. 6, p. 860–863, 1 Jun. 2020.
- Caccialanza, R. et al. Early nutritional supplementation in non-critically ill patients hospitalized for the 2019 novel coronavirus disease (COVID-19): Rationale and feasibility of a shared pragmatic protocol. *Nutrition*, v. 74, 2020.
- Barazzoni, R. et al. ESPEN expert statements and practical guidance for nutritional management of individuals with SARS-CoV-2 infection. 2020.
- Qiu Haibo, Li Xuyan, Du Bin, et al. Pensando no tratamento de nova pneumonia por coronavírus criticamente grave (1) [J / OL]. *Chinese Journal of Tuberculosis and Respiratory*, 2020, 43 (2020-02-23) .
- Anderson, L. Providing nutritional support for the patient with COVID-19. *British Journal of Nursing*, v. 29, n. 8, 2020.
- Yu Kaiying, Shi Hanping. Interpretação de "Recomendações de especialistas sobre terapia nutricional médica para pacientes com pneumonia por Coronavírus Nova" [J]. *Chinese Medical Journal*, 2020,100 (10): 724-728. DOI: 10.3760 / cma.j .cn112137-20200205-00196
- Chapple, L. S. et al. Nutrition management for critically and acutely unwell hospitalised patients with coronavirus disease 2019 (COVID-19) in Australia and New Ze. *Australian Critical Care*, v. 33, pág. 399-406, 2020.
- Sanches, F. L. F. Z.; Ferreira, T.; Guimarães, R. C. A. Risco nutricional em pacientes hospitalizados: comparação de três protocolos de triagem nutricional. *Multitemas*, v. 23, n. 55, p. 245, 2018.
- Arruda, N. R.; Oliveira, A. C. C.; Garcia, L. J. C. Risco nutricional em idosos: comparação de métodos de triagem nutricional em hospital público. *RASBRAN - Revista da Associação Brasileira de Nutrição*. São Paulo, SP, Ano 10, n. 1, p. 59-65, Jan-Jun. 2019 - ISSN 2357-7894.
- Sanson, G. et al. Prediction of early- and long-term mortality in adult patients acutely admitted to internal medicine: NRS-2002 and beyond. *Clinical Nutrition*, v. 39, n. 4, p. 1092–1100, 2020.
- Pironi L. et al. Malnutrition and nutritional therapy in patients with SARS-CoV-2 disease. *Clin Nutr.* v. 20, 2020.
- Reis, A. M.; Fructhenicht, A. V.; Moreira, L. F. NUTRIC score use around the world: a systematic review. *Revista Brasileira de Terapia Intensiva: Porto Alegre*, v. 31, n. 3, pág. 379-385, 2019.
- Ferreira, C. J. F. et al. Nutritional therapeutic for the critically ill patients. *Medicina*, v. 36, n. 2–4, p. 394–398, 2003.
- Barbosa, A. O.; Vicentini, A. P.; Langa, F. R. Comparação dos critérios da nrs-2002 com o risco nutricional em pacientes hospitalizados. *Ciência e Saúde Coletiva: Rio de Janeiro*, v. 24, n. 9, Set. 2019.
- Raslan, M. et al. Aplicabilidade dos métodos de triagem nutricional no paciente hospitalizado. *Revista de Nutrição: Campinas*, v. 21, n. 5, 2008.
- Campos, L. F. et al. Parecer BRASPEN/ AMIB para o Enfrentamento do COVID-19 em Pacientes Hospitalizados. *BRASPEN*, 2020.
- McClave, S. A. et al. Diretrizes para o fornecimento e avaliação da terapia de suporte nutricional em pacientes adultos em estado crítico: Society of Critical Care Medicine (SCCM) e American Society for Parenteral and Enteral Nutrition (ASPEN). *Journal of Parenteral and Enteral Nutrition*, v. 33, n. 3, pág. 277-316, 2009.
- Blaser, A. R. et al. Nutrição enteral precoce em pacientes críticos: diretrizes de prática clínica da ESICM. *Medicina de terapia intensiva*, v. 43, n. 3, pág. 380-398, 2017.
- Nutrition Therapy in the Patient with COVID-19 Disease Requiring ICU Care, SCCM and ASPEN. *Society of Critical Care Medicine*, 2020.
- Singer, P. et al. ESPEN guideline on clinical nutrition in the intensive care unit. *Clinical Nutrition*, set. 2018.
- Arkin, N. et al. Nutrition in critically ill patients with COVID-19: Challenges and special considerations. *Clinical Nutrition*, v. 39, pág. 2327-2328, 2020