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

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.

DESCRIP'TORS: 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 isosmética 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.

DESCRITORES: COVID-19; recomendações nutricionais; e terapia nutricional.
INTRODUCTION

COVID-19 is a disease caused by a new strain of a virus in the family Coronaviridae, known as pandemic respiratory syndrome associated with the new coronavirus (SARS-CoV-2), whose main forms of transmission are droplets and aerosols. Generally, patients develop 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).

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

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. 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. 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-
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.

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. Some articles 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.

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

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

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<table>
<thead>
<tr>
<th>Methodology</th>
<th>Scale</th>
<th>Formula</th>
<th>Nutritional Management</th>
<th>Infusion Method</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRS-2002</td>
<td>NE</td>
<td>≥20%</td>
<td>Oropharyngeal or Nasogastric</td>
<td>Infusion via central catheter (if available) or peripheral</td>
<td>Brugliera et al. 2020</td>
</tr>
<tr>
<td>NRS-2002</td>
<td>SO</td>
<td>≥20%</td>
<td>Oropharyngeal or Nasogastric</td>
<td>Infusion via central catheter (if available) or peripheral</td>
<td>Caccialanza et al. 2020</td>
</tr>
<tr>
<td>NRS - 2002</td>
<td>NE</td>
<td>24-48h</td>
<td>Oropharyngeal or Nasogastric</td>
<td>Infusion via central catheter (if available) or peripheral</td>
<td>Laviano et al. 2020</td>
</tr>
<tr>
<td>NRS-2002</td>
<td>NE</td>
<td>24-48h</td>
<td>Oropharyngeal or Nasogastric</td>
<td>Infusion via central catheter (if available) or peripheral</td>
<td>Gupta et al. 2020</td>
</tr>
<tr>
<td>NRS-2002</td>
<td>NE</td>
<td>24-48h</td>
<td>Oropharyngeal or Nasogastric</td>
<td>Infusion via central catheter (if available) or peripheral</td>
<td>Qiu Haibo et al. 2020</td>
</tr>
<tr>
<td>SGA or GLIM</td>
<td>NE</td>
<td>-</td>
<td>Oropharyngeal or Nasogastric</td>
<td>Infusion via central catheter (if available) or peripheral</td>
<td>Yu Kaiying et al. 2020</td>
</tr>
<tr>
<td>DEVE, MST, MAN, [MNA-5F]</td>
<td>NE</td>
<td>At least 24h after admission</td>
<td>Oropharyngeal or Nasogastric</td>
<td>Infusion via central catheter (if available) or peripheral</td>
<td>Chapple et al. 2020</td>
</tr>
</tbody>
</table>
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. 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. 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. The criterion adopted to choose NRS 2002 or NUTRIC should be the severity of the patient, the second is more recommended for critically ill patients. It should also be noted that, for elderly patients, the MAN method has better specificity and sensitivity.

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.

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. However, in critically ill patients, NE is the preferred route and it is suggested that it be started within 24-48 hours, which also corroborates European and American intensive care guidelines.

Regarding the energy recommendation, 33.3% of the studies indicated the 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 atrophy, higher protein contents are indicated, mainly, containing branched chain amino acids to promote greater protein synthesis.

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 hospitalization, 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.

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


