

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

Caccialanza R, Laviano A, Lobascio F, Montagna E, Bruno R, et al. *Nutrition*. 2020;74: 110835.

Introduction:

People with COVID-19 have symptoms that vary widely, but patients admitted to hospitals often have severe signs and symptoms—inflammation, anorexia, progressive respiratory failure, and pneumonia. Factors associated with such worsening are older age, smoking history, elevated body temperature, high C-reactive protein levels, and low serum albumin levels. As well, low prealbumin levels often correlate with progressive respiratory failure and need for mechanical ventilation. Such severe symptoms negatively impact appetite and oral intake, which can lead to malnutrition and weakened immune function, in turn causing impaired immune response and delayed recovery from COVID-19.

Objective:

To share a practical approach to malnutrition screening and nutrition care to implement recommendations for early nutritional supplementation in patients with COVID-19. Nutrition care advice is based on expert opinion, supported by scientific evidence, and adapted for coronavirus-related clinical conditions (capacity constraints and contact limitations).

This straightforward and protocolized approach is needed based on the impact of nutritional status on COVID-19 symptom progression and immune function.

Expert Opinion Recommendations:

Nutrition interventions for all hospitalized patients with COVID-19

For all coronavirus-infected patients, increased protein (1.5 g/kg/day) and calorie (25-30 kcal/kg/day) intake is recommended, along with vitamins and nutrients that have anti-inflammatory properties.

To increase oral protein intake, administration of oral nutrition supplements containing whey proteins (20g/day) are initiated upon admission for all patients. Whey protein supplements are easy-to-digest and have anabolic and antioxidant properties. Recent studies have shown that whey proteins have immunomodulatory properties and possible antiviral effects.

Multivitamins, minerals, and trace elements should be administered intravenously to meet recommended dietary allowances (RDA), avoid or correct vitamin and micronutrient deficits, and to leverage their antioxidant properties. Cholecalciferol treatment is used to prevent or treat 25-hydroxyvitamin D deficiency. Such supplementation reduces inflammation and immune activation, promotes immune response during antiretroviral treatment, and supports immune response to pathogens.

As with all hospitalized patients, diets of different consistencies must be available.

Simplified Nutritional Screening

Upon admission to the hospital, patients should have body weight and height measured (or estimated) along with biochemical tests (albumin, transferrin, prealbumin, glucose, kidney and liver function, electrolytes, triglycerides, folic acid, vitamin B12, 25-hydroxyvitamin D, C-reactive protein).

A simplified nutritional risk screening uses 3 questions with “yes” or “no” responses:

- BMI < 22kg/m²?
- Weight loss over last 3 months?
- Reduced food intake or anticipated reduction of oral intake?

If there is a “yes” response to any of the questions, these patients are considered “at risk,” and oral nutrition supplements should be initiated.

Nutrition care for “at risk” patients

For patients identified as “at risk” during nutritional screening, 2-3 bottles of oral nutritional supplements should be given daily to provide between 600-900 kcal/day with 35-55 g/day protein. These supplements should be given between or after meals. If oral nutrition supplements are not tolerated (< 2 bottles/day for 2 days) or if the patient’s respiratory condition worsens, supplemental parenteral nutrition should be considered.

For non-invasive ventilated patients, parenteral nutrition is preferred over enteral nutrition as nasogastric tubes may interfere with the effectiveness of non-invasive ventilation (NIV) or continuous positive airway pressure (CPAP). Data showed higher rates of airway complications and longer NIV duration for patients who received enteral nutrition. In addition, patients with COVID-19 may experience gastrointestinal symptoms that can lead to diarrhea and compromised nutrient absorption.

Parenteral nutrition can provide glucose, amino acids, electrolytes, multivitamins, and minerals using a multichambered bag given via a central or peripheral infusion line (18-24 hr./d). Lipids can be given if the basal triglyceride levels are < 200 mg/dL.

Since the use of indirect calorimeters may not be possible, energy needs are calculated with the Harris-Benedict equation (resting energy expenditure) using a correction factor of 1.5. Amino acid requirements are calculated at 1.5 g/kg actual body weight.

Discussion:

The aim of these recommendations for the nutritional management of non-critically ill patients with COVID-19 is to ensure that nutrition care is delivered safely and effectively to optimize recovery.

Many factors interfere with the provision of adequate nutrition care for these seriously ill hospitalized patients. Height, weight, and body measurements may be impossible to perform due to safety and infection-control policies. Underfeeding may occur due to limited oral intake monitoring by clinicians, and to elevated and unmet energy and protein needs. Limitations in the availability of both oral and parenteral solutions and equipment further complicates this problem. Utilizing this simplified protocol can help make sure patients receive the nutrition care needed to support their recovery from COVID-19.

Unfortunately, some non-critically ill COVID-19 patients will progress to needing critical care. In this setting, high protein/calorie highly digestible enteral formulas supplemented with n-3 fatty acids or other immune or inflammation modulating nutrients should also be considered.

Conclusions:

The implementation of nutrition care for hospitalized non-critically ill patients should be considered a priority to prevent malnutrition and optimize recovery from COVID-19.

Summary prepared by Nestlé Health Science.

The complete study may be accessed online:

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