Clinical Nutrition Highlights

eNewsLetter

Nestlé HealthScience

Resources for nutritional management of patients with COVID-19

INTRODUCTION

Nutrition and rehabilitation in the post-ICU hospitalisation following COVID-19 & Acute Respiratory distress syndrome

Acute respiratory distress syndrome is severe and often fatal acute respiratory failure characterized by diffuse inflammatory lung injury rapidly progressing to increased pulmonary vascular permeability, increased lung weight, and hypoxemia. Most commonly secondary to pneumonia, no pulmonary sepsis, and trauma. Worsening respiratory status most commonly develops within 1 week of clinical insult. Nutrition research has focused on the early, acute period of critical illness, until more recently, where the post-ICU hospitalization period in critical care survivors has become a focus for nutrition rehabilitation. In this period, nutrition rehabilitation may be a vital component of recovery. Calories and protein intake remain below predicted targets in the post-ICU hospitalization period and achieving nutrition targets are complex and multifactorial but can primarily be grouped into three main areas: patient factors, clinician factors, and system factors.

> **A nutrition intervention in the post-ICU hospitalization period may provide an opportunity to improve survival and functional recovery.** In addition, high levels of physical, cognitive, and psychosocial impairments can be anticipated. Rehabilitation providers will serve as an important link in the continuum of care, helping move patients on from acute sites to eventual discharge to the community.

AIM

Nutrition research has focused on the early, acute period of critical illness, until more recently, where the post-ICU hospitalization period in critical care survivors has become a focus for nutrition rehabilitation. In this period, nutrition rehabilitation may be a vital component of recovery.

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1 COVID-19 INFECTION, ARDS, AND DISABILITY

Critical illness for any reason has major long-term sequelae, prompting the characterization of "post-ICU syndrome," defined as "new or worsening impairment in physical, cognitive, or mental health status arising after critical illness and persisting beyond discharge from the acute care setting.

One of the most common physical sequelae post-ICU hospitalisation is ICU acquired weakness, which is very common after ARDS, estimates suggesting anywhere between 25% and 100%, thought to relate to immobility, suboptimal glycaemic control, and iatrogenic use of steroids and neuromuscular blocking agents. Critical illness polyneuropathy and critical illness myopathy are also common, reported in almost 25%–46% and 48%–96%, respectively. Intensive care unit–acquired weakness confers a major determinant of poor long-term functional outcome and costly rehabilitation and care needs.

Impairment of cognitive function is common after ARDS. Delirium can affect up to 80% in general ICU settings. Cognitive impairment after ARDS has been noted to affect most survivors at hospital discharge and in approximately 10% impairments are persistent at long-term follow-up. Neuropsychological impairments are multidimensional and include memory, attention, and higher-order executive functions.

Persistent mental health impairment is commonly described after treatment in the ICU, with pooled estimates reporting high prevalence rates of depression (29%), posttraumatic stress disorder (22%), and anxiety (34%) affecting survivors at 1 yr. because of infection control requirements and public health imperatives, patients may be separated from families for prolonged periods, particularly if critically ill and In the context of a pandemic, it is possible that families may not see or speak to their loved one at all during admission, in fatal cases never again.

2 WHAT HAPPENS TO NUTRITION INTAKE IN THE POST-ICU PERIOD?

Nutrition delivery during the ICU period is most often with enteral or intravenous nutrition, achieving between 50 and 60% of energy prescription. Following discharge to the post-ICU ward, oral intake is also variable and often less than prescribed.

Oral intake is the most common form of nutrition during the ICU period, but calorie and protein intake is lowest with oral intake alone. The supplementation of oral intake with oral nutrition supplements or enteral nutrition provides the highest calorie and protein intake.

In an observational study thirty-two (32) patients were studied in the post-ICU hospitalization period. After discharge from ICU, energy and protein intake was quantified periodically and indirect calorimetry attempted. Oral nutrition either alone (n = 124 days, 55%) or in combination with enteral nutrition (n = 96 days, 42%) was the predominant mode.

Over 227 total days in the post-ICU hospitalization period, a median of 1238 kcal and 60 g of protein was received from nutrition therapy. In the 12 patients who had indirect calorimetry, the median measured daily energy requirement was 1982 kcal and daily energy deficit was −95 kcal compared with the measured energy requirement.

The study concluded, that Energy and protein intake in the post-ICU hospitalization period was less than estimated and measured energy requirements. Energy and protein provision was lowest in patients receiving oral nutrition without supplements. Energy and protein intake were highest in those who received combined oral and enteral nutrition.

3 ISSUES, BARRIERS & CHALLENGES TO NUTRITION INTAKE IN THE POST-ICU PERIOD

Issues and barriers to nutrition intake in the post-ICU period are not widely understood currently, although it appears for ICU survivors, several barriers reduce nutrition delivery, categorized broadly as patient-related, clinician-related and system factors.

Patients factors:

- **Appetite and taste changes.**
  - Early in critical illness, there is derangement in hormones released from the gastrointestinal tract known to control appetite and satiety including cholecystokinin (CCK), peptide YY (PYY), glucoselike peptide 1 (GLP-1), and ghrelin. In some patients it can persist up to 3 months after ICU discharge.
  - Reduced appetite has been shown to negatively correlate with hospital length of stay and reduced self-reported physical function.
- **Gastrointestinal disturbances.**
- **Swallow function.** Up to 62% of ICU survivors experience dysphagia, with a greater duration of tracheal intubation increasing this likelihood.
- **Physical function.** Debilitating and persistent weakness and reduced physical function. Later in the recovery phase, patients that have returned home but remain weak may struggle to mobilize or manage fine motor skills required to shop and cook, further contributing to limited intake.
- **Psychosocial.** Delirium is a frequent consequence of critical illness and significant psychosocial deficits, including depression, persist post-ICU discharge with a potential impact on oral intake.

Clinician factors:

- **Transitional care.** Inadequate transitional care from ICU clinicians to the ward, with the lack of nutrition documentation on ward transfer.
- **Feeding tube removal.** Removed without appropriate assessment of oral nutrition adequacy.
- **Nursing care.** Competing work priorities is an important consideration, with nutrition often being prioritized less than other nursing tasks.

System factors:

- **Large portions provided.** For patients where fatigue is a complicating factor, small frequent meals are likely to improve nutritional intake.
- **Limitations of structured mealtimes.** Food access at times of hunger seen as a challenge and associated with reduced energy and protein intakes when compared with 'on-demand' food service. In survivors of ICU, the inability to access food overnight or between main meals may be a greater problem as they return to the normal day–night cycle usually lost in ICU.

It is highly likely that longer duration nutrition interventions may impact recovery. This has been shown in a population outside of critical care. In patients who are eating, the combination of food with oral nutrition supplements will provide the opportunity for higher energy and protein intake compared with food alone

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