

Nutrition in intensive care

Nutritional support has now come to be recognized as *sine qua non* in management of critically ill.^[1] It has gained importance with better understanding of the pathophysiology of protein energy malnutrition (PEM) in intensive care unit (ICU) patients and optimal modalities in administration of nutritional therapy.^[2,3] Its status has changed from being adjunct in critical care to that of definitive therapy. Vincent has emphasized the importance of feeding the ICU patient in a simple but appealing mnemonic – “FAST HUG” (Feeding, Analgesia, Sedation, Thromboembolic prophylaxis, Head end elevation, Ulcer prophylaxis, and Glucose control).^[4]

Preexisting and ongoing PEM is a common problem in the hospitalized patients, but its status is often difficult to precisely estimate, partly due to the increased catabolism coupled with existence of chronic wasting conditions.^[5,6] In addition, anorexia, depression, gastrointestinal symptoms, therapeutic restrictions, and other medical/surgical factors contribute to aggravation of malnutrition. PEM in the critically ill is associated with muscle weakness, increased risk of infections, impaired wound healing, and prolonged time to convalescence.^[6] Timely initiation of optimal nutritional support is important to limit the catabolic process and minimize adverse events such as prolonged mechanical ventilation, longer ICU stay, and increased risk of death.^[7] Various strategies have been suggested in randomized controlled trials and meta-analyses to improve nutritional status such as early/late enteral nutrition, enteral supplemented with parenteral nutrition, continuous enteral feeds, timing of enteral feeds, nutrients with specific functions/role, and use of adjuvants in feeds.^[8,9] Moreover, data from observational studies suggest wide variations in the ICU feeding practices resulting in inappropriate attainment of nutritional targets.^[10,11]

It is now firmly established that the enteral route is the preferred for nutritional support.^[12-14] To emphasize the importance of the enteral route, Livingston *et al.* very aptly coined their article “If the gut works use it,” a phrase commonly used today.^[15] Current recommendations advocate the initiation

of feeds within 24 h of ICU admission through the enteral route, if possible. However, there is controversy about the level of nutritional support, its composition, and supplements which are deemed to modify the disease severity. As better conducted studies emerge, the perceptions among clinicians on role of “immunonutrients” is changing with an emphasis on targeting specific subsets of population, which are likely to benefit from the therapy, thus reducing costs.

Firm recommendations on the use of feeding protocols in critically ill patients are wanting. However, a protocol that incorporates the use of prokinetics, initiates the volume of feeds gradually, and tolerates a higher gastric volume (250 ml), should be considered to optimize delivery of enteral nutrition in critically ill adult patients.^[12] In patients who experience feed intolerance (high gastric residues, emesis), prokinetics like metoclopramide must be considered to improve gastric emptying and enhance gut motility.^[12] Enteral nutrition must be administered with the head of the bed elevated to 45° to reduce the risk of aspiration and decrease the incidence of ventilator associated pneumonia.

Direct administration of feeds to small bowel is recommended when gastric feeding is not feasible, specifically in conditions where there is a higher risk of aspiration (persistent high gastric residues, continuous use of sedatives/neuromuscular blockers) or when at high risk of intolerance to enteral nutrition (moderate to high doses of inotropes/vasopressors).^[12] Bowel sounds are only indicative of contractility and may not relate to mucosal integrity, barrier function, or absorptive capacity.^[13] Bowel sounds and evidence of bowel function (i.e., passing flatus or stool) are not required for initiation of enteral feeding.

Parenteral nutrition is indicated only when enteral nutrition is “contraindicated” (short gut syndromes, proximal high output fistula, perforated bowel, bowel obstruction, severe gastrointestinal bleed, and severe hemodynamic instability). Recommendations for initiation of parenteral therapy in patients, where enteral nutrition is contraindicated, vary from 3–7 days amongst different various guidelines.^[6]

The objectives of nutritional support till recently were limited to preserving lean body mass, maintaining immune function, and averting metabolic complications. Nutrition support is now more focused on attenuating the metabolic response to stress, preventing oxidative cellular injury, and modulating the immune response. Nutritional modulation of the stress

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response includes early enteral nutrition, appropriate macro and micronutrient delivery, and meticulous glycemetic control.^[13]

Controversy persists in various nutritional support guidelines with regard to the timing of initiation, quantum of calories, monitoring, use of adjuvant therapies such as probiotics/immunonutrition, indications/timing of parenteral nutrition, and support during specific conditions such as involvement of the renal, pulmonary, and/or hepatic systems.

Nutritional support in the ICUs world over has been shown to be suboptimal both in prescription and delivery.^[16,17] Many studies are available in literature on the adequacy of the nutritional support and its comparisons to patient outcomes. A study from an Indian tertiary care hospital showed that protein and calorie delivery to the critically ill was less than that recommended and this was associated with higher odds toward mortality.^[18]

As an old saying goes “What the mind knows the eyes see...”. The awareness among paramedical staff about nutritional therapy is important for the overall management of patients in the ICU. Studies have not focused on the level of knowledge of the staff responsible to provide nutritional support, which could have resulted in the guidelines not being followed in the correct perspective. Practices and protocols followed in various ICUs are not uniform, leading to changing perceptions among the nursing staff. While there has been rapid growth in intensive care settings in the last decade, with an increase in the numbers of dedicated intensivists and critical care centers, the growth of trained paramedical services in terms of quantity and quality has been a limiting factor in most centers.

Gupta *et al.*, in this issue of the journal, highlight the issue of nutrition therapy delivery and the awareness of current recommendations amongst the nursing staff of a tertiary care hospital.^[19] They report that after the conduct of their survey, there is greater involvement and participation of nurses in formulating the nutrition plans of the patients and a new teaching program has been initiated.^[19] Although this study is merely an analysis on the understanding by the staff of various aspects of nutritional support, there is a need for future studies focused on determining whether the perceptions by the paramedical personnel are important in determining better outcomes from nutritional support. Such periodic surveys, conducted in-house, would help in improving the practice and help educate the staff on current recommendations and guidelines.

Undernutrition is consistently common among ICU patients around the world even today.^[20] There is a need to emphasize that nutritional support of critically ill is a primary therapeutic

strategy.^[21] Increased survival of severely ill patients has been made possible by improvement in the understanding of nutrition requirements and techniques to deliver nutrients. As our understanding of nutrition in the critically ill advances, the trio of physician, dietician, and nursing staff need to be periodically updated on the current recommendations by expert groups to enable better practices and thereby improve outcomes.

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