NUTRITIONAL CARE IN CHRONIC CRITICAL ILLNESS SYNDROME (PART TWO OF TWO)

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PROVISION OF NUTRITIONAL SUPPORT

Oral nutrition is the preferred delivery route. Most patients with chronic critical illness (CCI) are unable to take three meals each day and must be given supplemental nutrition to meet their energy and protein requirements. In most cases, enteral feeding with tube feed formulas is appropriate. Patients who have a functional gastrointestinal tract should be fed enterally with tube feeds. Parenteral nutrition may also be used, but is only recommended in patients with nonfunctional gastrointestinal tracts.

A number of observational trials and several meta-analyses compare enteral nutrition with parenteral nutrition. While these studies are limited in their selection techniques and non-randomized methods, they suggest that enteral feeding is associated with lower rates of infections and is less costly. A recent multicenter randomized trial evaluated the use of parenteral nutrition in newly admitted ICU patients to supplement enteral nutrition. Despite the slow advancement of enteral nutrition administration, waiting at least seven days to initiate parenteral nutrition decreased length of ICU stay, decreased time on mechanical ventilation and reduced overall cost of hospitalization. Early administration of parenteral nutrition in critically ill patients led to worse outcomes. These findings are consistent with American Society for Parenteral and Enteral Nutrition (ASPEN) recommendations that suggest at least five to seven days of failed enteral feeding before starting parenteral nutrition. Of note, severely malnourished patients were excluded from this trial.

Enteral feeds are usually started after radiographic confirmation of nasogastric/ enteric tube placement or 24 hours after gastrostomy/jejunostomy. Initial infusion rates may be 10 to 30 mL/ hour and increased to goal rates over one to two days depending on patient tolerance.

The choice of tube feed formula is based on a number of factors including the presence of certain medical conditions and availability of various products. Standard tube feed formulas are among the least expensive and are appropriate for use in most patients. These formulas contain intact protein and approximately 50% of their calories are in the form of carbohydrates.

A number of disease-specific formulas are available, though only some perform clinically as advertised. Diabetes-specific formulas contain a lower concentration of carbohydrates and lower blood glucose levels in patients who are hyperglycemic. There are other tube feed formulas that are not specifically marketed for diabetic patients that also contain low levels of carbohydrates. In comparison studies, these "non-diabetes specific" formulas performed similarly and would also be appropriate in hyperglycemic patients. For diabetic or hyperglycemic patients, use of a tube feed formula that contains 35 to 45% of calories in the form of carbohydrates would be appropriate.

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Semi-elemental tube feeds contain partially hydrolyzed proteins and peptides that may be easier to absorb in patients who have gastrointestinal ischemia or osmotic diarrhea.

Renal-specific formulas are more concentrated, thus they deliver less volume. These formulas also contain low amounts of potassium and phosphorus. Because of these characteristics, they can be useful in patients with either acute or chronic kidney disease.

Administration of adequate amounts of the appropriate tube feed formula is central in the provision of nutritional support to CCI patients. For patients with a nonfunctional gastrointestinal tract, parenteral nutrition may be required.

VITAMIN D AND BONE HEALTH

Critically ill patients demonstrate high rates of vitamin D insufficiency. Several studies show the prevalence of vitamin D insufficiency to be 90 to 97% among critically ill patients. A number of factors may contribute to this including lack of sun exposure, high rates of vitamin D insufficiency in the general population and even higher rates of vitamin D insufficiency among older individuals or those with underlying chronic disease. Diminished circulating levels of vitamin D binding protein in critical illness also contribute to low overall vitamin D.

In several studies, critical illness survivors were found to have higher levels of vitamin D than non-survivors. In one trial, vitamin D insufficiency also predicted increased length of ICU stay.

Very few studies have evaluated the use of vitamin D replacement or supplementation in CCI. Presently there are not specific guidelines for supplementation of vitamin D in these patients. However, given the high rates of bone resorption and of vitamin D insufficiency in CCI, it may be reasonable to treat with vitamin D supplementation. A short-term study demonstrates safe use of 2,000 international units of vitamin D daily in CCI patients. More studies are needed before vitamin D replacement can be recommended for all CCI patients.

CONCLUSION

Nutritional management and support in CCI remains a highly important aspect in the medical care of these patients. The judicious use of enteral and/or parenteral nutrition can lead toward favorable outcomes.

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