
Nutritional Assessment of Intensive-Care Unit Patients

I would like to congratulate Dr. Murray and colleagues on their analysis of the nutritional assessment of intensive-care unit patients, published in the November 1988 issue of the Proceedings (pages 1106 to 1115). As they stated, nutritional support is expensive, and guidelines for implementation of such support are needed. Unfortunately, their conclusion that “serum albumin...is still the best, most commonly used measurement of nutrition available” is in error.

The measurement of serum albumin concentrations is clearly important—numerous studies have shown that it can be used to predict outcome, mortality, and morbidity. With regard to the article by Murray and associates, however, the pertinent question is, Can aggressive nutritional support improve albumin concentrations and therefore improve outcome?

With this question in mind, Dicker and I recently reported the results of a study involving 545 hospitalized patients, in whom the association among anthropometric determinations, albumin concentration, and mortality, as well as the effect of nutritional support on albumin concentrations and nitrogen balance, was investigated. Our findings were in agreement with those of other studies, in that no association was detected between albumin concentrations and anthropometric determinations (for example, marasmic patients with depleted body stores had normal albumin concentrations, and well-nourished trauma victims had low concentrations) but that, conversely, the serum level of albumin was strongly related to the severity of the illness and the associated risk of mortality. Furthermore, in the subgroup of patients who received total parenteral nutrition, we noted no association between improvement in nitrogen balance and improvement in albumin concentration.

In view of these findings and the original question, how can we decide when to implement nutritional support? Unfortunately, no controlled trials have been designed to determine the duration of starvation that can be tolerated before survival is affected—possibly because premeditated starvation would be considered unethical by most review bodies. Thus, we must rely on estimates based on knowledge of the physiologic and pathologic responses to starvation and injury. It would seem reasonable, therefore, to provide immediate nutritional support to patients with depleted body stores, inasmuch as acute illness is known to be associated with increased mobilization and oxidative losses of such stores. In patients who have normal body stores, the urgency of such measures is reduced, and fluid and electrolyte support alone should be adequate initially. As a general guideline, most authorities recommend implementation of full nutritional support after 5 days of starvation under these conditions.

The measurement of albumin concentration, however, should remain part of the nutritional assessment because it can be used to predict the degree of illness, a factor that can, in turn, be used to predict possible metabolic instability (for example, glucose intolerance) and altered handling of infused nutrients. It can also serve as a useful monitor of overall clinical progress.

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The authors reply

We thank Dr. O’Keefe for his interest in our article and for his comments. In regard to his statement that our conclusion was in error, however, I would point out that our conclusion was not that the serum albumin concentration was “the best, most commonly used measurement of nutrition available,” but rather that “Although using the serum albumin...has limitations, currently it is the best commonly used prognostic [italics added] indicator for patients in the intensive-care unit.” We agree that the serum albumin is probably more a marker of severity of illness in hospitalized patients than it is of nutritional assessment. To argue that it is only a marker of severity of illness and not of nutritional status, however, refutes the findings of Dr. O’Keefe’s own study. Although Dr. O’Keefe states that he and Dicker found no association between albumin concentrations and anthropometric determina-
tions in their study of hospitalized patients, review of their data reveals otherwise: a significant correlation ($r = 0.46; P<0.01$) was found between low albumin concentrations (less than 3.5 g/dl) and low measurements of arm muscle circumference (less than 80% of ideal). Many factors influence the level of serum albumin; the nutritional status of the patient is surely one of them.

The argument that the serum albumin concentration reflects only the severity of illness implies that, even if one were somehow able to normalize serum albumin concentrations in sick patients, because of the severity of the underlying illness, improvement in outcome could not be anticipated. Brown and associates found just the opposite, however; the addition of normal serum albumin to parenteral nutrition in hospitalized patients produced a statistically significant decrease in the frequency of hospital complications.

The role of serum albumin concentrations in the assessment of nutritional status is a controversial topic and will probably remain so. The more fundamental question is, as Dr. O'Keefe stated, When should nutritional support be implemented? The American College of Physicians and the American Society for Parenteral and Enteral Nutrition have promulgated guidelines advocating the immediate use of nutritional support in high-risk malnourished patients. How does one define "malnourished"? Dr. O'Keefe advocates immediate nutritional support for patients with depleted body stores. Using "depleted body stores" as a definition of malnutrition has as many pitfalls as use of the serum albumin concentration. In our group of patients, the level of serum albumin, despite its limitations, was better than any other factor we measured in identifying a group of patients who might benefit from early nutritional support.

Thus, it is incumbent on those interested in nutritional support to continue to seek better, easily quantified markers of nutritional status that will aid in the management of critically ill patients.

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REFERENCES

An Obsolete Procedure
In their contribution to the Symposium on Sensitive TSH Assays, published in the November 1988 issue of the Proceedings (pages 1123 to 1132), Klee and Hay reported on the comparative sensitivity of three radioimmunoassays for thyrotropin: the Hybritech two-step Tandem-R method, the semiautomated Boots-Celltech Sucrosep method, and a modified Ciba Corning Magic Lite method. They found the Hybritech two-step assay to be the least sensitive of the three. This method is obsolete and was discontinued by the manufacturer in December 1987.

The two-step procedure, introduced in January 1983, was joined by a faster method, the one-step Tandem-R assay, in December of that year. The one-step method, also an immunoradiometric assay (IRMA), was recommended as superior to the Wellcome Dac-Cel, a "non-sandwich" assay, in a report from our laboratory in January 1986. The one-step assay was discontinued by Hybritech in July 1987, after release of their Tandem-R HS (high-sensitivity) IRMA procedure in January of that year. After verifying the accuracy of the minimal detectable dose (the concentration that corresponds to the counts per minute [cpm] that is 2 SD from the mean cpm of 20 replicate determinations of the zero calibrator) specified in the package insert (0.05 mIU/liter), we began using this test routinely in March 1987 and continue to do so to the satisfaction of the attending endocrinologists at our medical center.

Klee and Hay do a disservice to the clinical and laboratory community by reporting on an obsolete product and comparing it with others that were designed to provide greater sensitivity.

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