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Monitoring Nutritional Status in Burn Patients

To the Editor:

Rettmer et al. (1) compared the performance of several static measurements of serum concentrations with some functional tests for the nutritional assessment of burn patients. Although their conclusion that functional tests generally provide a more accurate evaluation of nutritional status is probably correct, their interpretation of their results is questionable. To compare these two categories of tests, the nutritional status of the studied patients must be known. The authors classified all their patients as nutritionally replenished, this judgment being based on the estimated calories met, the weight change, and the nitrogen balance. However, these three characteristics reflect only the protein and caloric nutritional status. They do not necessarily indicate that concentrations of all trace minerals and vitamins are normal. Furthermore, these measures are also limited as markers of protein–calorie status in burn patients (2, 3). For example, one of their patients achieved only 46% of his estimated calorie needs but was nonetheless considered to have been adequately fed. Weight gain is difficult to interpret in burn patients because they can develop considerable edema, which accounts for the greater part of the weight gain in the first weeks after the burn. In calculating the nitrogen balance, Rettmer et al. did not account for the losses of protein in burn wounds, which can amount to several grams per day (4).

The authors did not mention the composition of the diet. There is great diversity in the practices of burn centers concerning supplementation with trace minerals and vitamins (5, 6). Because Rettmer et al. did not evaluate the same nutrients with the static and the functional tests, we cannot be sure whether the differences they observed only reflect an insufficient supplementation of some elements.

The choice of some of the static tests is also dubious. Even in ambulatory patients, no one would judge the nutritional status by measuring singly the serum concentration of calcium or iron. A low serum concentration of calcium must be interpreted in light of the albumin concentration (7). Similarly, the concentration of transferrin (or the binding capacity of iron) must be known before one can interpret a low serum iron concentration. Also, the units for transferrin in their Figure 1 should read g/L instead of mg/L. If we take into account the low concentration of binding proteins, the observed concentrations of iron and calcium are probably in the low normal range. The same phenomenon could explain the "low" serum copper values obtained (6).

The serum concentration of carnitine can reflect the nutritional status of vitamin A only if it is a major source in the diet (9). Because their patients were probably supplemented with the vitamin and not the provitamin (carotene), the low concentrations obtained should have been expected.

Finally, their Figure 4 contains several errors. The results of the functional assays are presented in the form of activity coefficients, which are dimensionless. The units indicated (μmol/L) are thus inappropriate. The range of the zinc protoporphyrin/heme ratio cannot be correct because no results below the mean are indicated.

Despite the above restrictions, I agree with Rettmer et al. that there is a great need to develop new nutritional-assessment procedures.

References


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The authors of the article referred to comment:

To the Editor:

The comments of Massé underscore the difficulty in determining the nutritional status of burn patients (1). The nutritional support our patients received from day 1 post-burn consisted of enteral feeding with one of two standard 1 kcal/L formulas supplemented by central venous alimentation and a standard multivitamin package if needed. By day 5 all patients were meeting ≥84% of their estimated requirements. By day 15,