Nutritional Assessment in Primary Care

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KEYWORDS

• Malnutrition • Obesity • Nutrition assessment • Nutritional state • Nutrition risk

KEY POINTS

- Malnutrition is not well understood and thus is poorly defined. Signs of deterioration of nutritional status are subtle, especially in the setting of obesity.
- Both nutritional status and disease severity contribute to each patient's nutrition risk.
- A careful nutrition screen based on patient history, anthropometric measures, and physical examination help differentiate high from low probability of micronutrient/macronutrient deficiencies and deterioration of nutritional status.
- Patients whose initial screen is of high predictive value should go on to have further imaging or laboratory testing, leading to targeted management strategies and appropriate nutrition therapy.

INTRODUCTION

Clinicians receive limited training during medical school and residency in nutrition and obesity.[1] Nutritional assessment in primary care is essential, because it provides physicians with the needed tools to evaluate nutritional status and eventually treat individuals over a wide body mass index (BMI) range who may be at risk for macronutrient or micronutrient deficiencies. Evidence of poor nutritional state occurs at both ends of the BMI spectrum. It is said that obesity often hide in plain sight on a typical medical examination.[2] A minority of patients are in the healthy BMI (18.5–24.9 kg/m^2) category, with more than 70% being classified as either underweight (<18.5 kg/m^2), overweight (25.0–29.9 kg/m^2), or having obesity (>30.0 kg/m^2).[3] Evidence of poor nutritional status is more subtle in the setting of obesity, but still common. Surprisingly, patients with BMI greater than 30 kg/m^2 have an odds ratio of 1.5 for having evidence of malnutrition, compared with those with BMI less than 30 kg/m^2.[4] There are several conditions

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that predispose patients to deterioration of nutritional status and low BMI, such as chronic obstructive pulmonary disease (COPD), short bowel syndrome, cancer, eating disorders, substance abuse, inflammatory bowel disease, and older age.[2]

This article identifies conditions in which the nutritional state may be compromised. Clinicians need to know which laboratory, clinical, and radiologic studies are appropriate to identify poor nutritional status and provide assistance in directing therapy for patients at high nutrition risk. Clinicians need the skills to screen patients for risk of nutrient abnormalities, learning to differentiate those factors that have high versus low predictive value for detecting further deterioration of nutritional status.

DIFFICULTY DEFINING MALNUTRITION

Despite poor nutritional status being associated with increased morbidity and mortality in a wide range of medical conditions, malnutrition is not well understood, and thus remains poorly defined. Malnutrition has been defined broadly as a nutritional imbalance involving those patients who lack an adequate combination of macronutrients (fat, glucose, and protein), and micronutrients (minerals, trace elements, and vitamins) to repair and maintain tissues.[5] The American Society for Parenteral and Enteral Nutrition (ASPEN) and the Academy of Nutrition and Dietetics (AND) developed guidelines and a consensus statement on the definition of malnutrition that are applicable to a wide range of clinical settings.[5] The definition is based on several causal factors (social and environmental), and takes acute and chronic illness into consideration. Because no specific parameter has been highly predictive of malnutrition, the guidelines recommend a diagnosis of malnutrition if 2 of 6 characteristics are met.[5] These characteristics are insufficient energy intake, weight loss, loss of muscle mass, loss of subcutaneous fat, localized or generalized fluid accumulation, and diminished functional status determined by handgrip dynometry (**Table 1**).[5] Malnutrition is categorized as moderate or severe, with the consensus statement recognizing the difficulty in differentiating mild from moderate degrees of malnutrition.

Despite the consensus efforts of ASPEN and AND, the definition of malnutrition remains nonspecific, vague, and not universally accepted. In contrast, nutrition risk is more easily defined, and recognizes that both nutritional status and severity of disease contribute to the patient's overall risk. There are several tools that have been developed to help stratify the patients who are at nutrition risk and who may benefit from aggressive nutrition delivery. The Nutrition Risk in Critically Ill (NUTRIC) scoring system uses 6 variables to calculate the score: age, Acute Physiology and Chronic Health Assessment (APACHE) II, Sepsis-related Organ Failure Assessment, number of comorbidities, days from hospital to intensive care unit (ICU) admission, and interleukin-6 (IL-6) level.[6] The NUTRIC score ranges from 0 to 10. Those patients having scores between 6 and 10 have higher risk for adverse clinical outcomes (mainly mortality), and are more likely to see improvement in outcomes in response to aggressive nutrition therapy (compared with patients with low scores of 0–5). The NUTRIC score has been validated without using IL-6, because this test is not readily available at many hospitals.[6] In a revised and updated validation study of the NUTRIC score, a total of 1199 ICU patients with an overall 28-day mortality of 29% and a mean NUTRIC score of 5.5 were evaluated to determine whether the score correlated with mortality and whether adequate nutrition therapy would have a clinical impact on patient outcomes. The odds ratio of mortality at 28 days was multiplied by 1.4 for every point increase in the NUTRIC score. There were positive associations in 28-day survival and