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Malnutrition: Etiology, consequences, and assessment of a patient at risk

Cathy Alberda[1] MSc RD

Critical Care Dietitian

Royal Alexandra Hospital, Capital Health Region, 670-1 CSC, 10240 Kingsway Ave, Edmonton, Alta., Canada T5H 3V9

Andrea Graf[2] BSc RD

Clinical Dietitian

Alberta Hospital Edmonton, 17480 Fort Rd Box 307, Edmonton, Alta., Canada T5J 2J7

Linda McCargar* PhD RD

Professor, Human Nutrition

Department of Agricultural, Food and Nutritional Science, 4-10 Agriculture Forestry Centre, University of Alberta, Edmonton, Alta., Canada T6G 2P5

Malnutrition results from the imbalance of nutrients and energy provided to the body (too low), relative to its needs (too high). These needs increase dramatically with illness. This is certainly the case for patients with gastrointestinal diseases. Sub-optimal dietary intake, metabolic stress, malabsorption and increased nutrient demands, put a patient with gastrointestinal disease, at high-risk for malnutrition. The causes, consequences and assessment and monitoring indicators of malnutrition are reviewed herein.

Key words: nutrition; malnutrition; nutrient requirements; nutritional assessment; nutrition support; gastrointestinal disease.

* Corresponding author. Tel.: +1 780 492 9287; fax: +1 780 492 4265.
E-mail addresses: calberda@cha.ab.ca (C. Alberda), andreagraf@cha.ab.ca (A. Graf), linda.mccargar@ualberta.ca (L. McCargar).
[1] Tel.: +1 780 735 4439; fax: +1 780 735 5105.
[2] Tel.: +1 780 472 5604.

DEFINING MALNUTRITION

Definitions and prevalence in hospitals

There is no universally accepted definition of malnutrition, however, the World Health Organization states that malnutrition is the cellular imbalance between supply of nutrients and energy, and the body's demand for them to ensure growth, maintenance, and specific functions.[1] When malnutrition or risk of malnutrition is being established, it is necessary to specify both the type of nutrient or nutrients under consideration and the cut-off values that will be used to distinguish between normal and abnormal ranges, or between low and high risk of malnutrition.[2] Nutrients can be divided into micronutrients (vitamins, minerals, trace elements) and macronutrients (carbohydrates, proteins, fats). Marasmus and kwashiorkor represent the two major classifications of macronutrient malnutrition. Marasmus is the type of malnutrition seen in patients with prolonged starvation. It is easily recognized by a wasted, cachectic appearance. Although the diet may contain an acceptable protein to energy ratio, total dietary intake is inadequate.[3] This results in utilization of endogenous fat and muscle tissue reserves for energy. In contrast, kwashiorkor results from a deficit of protein despite a relative adequacy of energy, and as such, may develop over a shorter period of time. The most common physical effects of kwashiorkor are depigmentation of both hair and skin, and edema.[3] As a result, these patients may maintain relatively normal weight and anthropometric measurements. Without careful physical examination and review of biochemical data to reveal the large serum albumin loss, this form of malnutrition may be overlooked.[3] Protein energy malnutrition (PEM) is used in more recent literature to describe any individuals with protein or energy malnutrition. Malnutrition due to vitamin, mineral and trace element deficiencies may also occur in conjunction with PEM. Isolated vitamin or mineral deficiencies can also be detected in otherwise well-nourished patients.

First described in the 1920s, PEM was seen in developing, third world countries. Research and nutritional screening through a variety of nutrition risk classification systems has shown an increasingly high number of hospitalised patients in developed nations are malnourished.[1] A British study showed that 40% of hospitalised patients are undernourished at admission and 78% of those suffered further deterioration in their nutritional status during hospitalisation.[4] Despite overwhelming evidence of the existence of malnutrition in western world hospitals, a widely accepted screening system to detect malnutrition is a limiting factor to improving the nutritional status of hospitalised patients. Subjective global assessment (SGA) and the European model of nutrition risk screening (NRS-2002) will be discussed later in the chapter.

ETIOLOGY OF MALNUTRITION

Starvation

During short or extended periods of inadequate caloric intake, the human body is capable of utilizing its own body tissue for fuel. Much of what we know today with regards to starvation is due to the classic study done by Ancel Keys in the 1950s at the University of Minnesota. The purpose of this study was to gain insight into the physical and psychological effects of semi-starvation and the problems of refeeding civilians who