Masked malnutrition

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Abstract

This brief communication highlights the importance of malnutrition in primary practice. Malnutrition may be masked, or may not be obvious (hidden hunger, i.e., micronutrient deficiency, sarcopenic obesity, lipokathexis). At the same time, malnutrition itself may mask or delay the diagnosis and treatment of other diseases. Even in today's world, the primary care physicians must remain alert for symptoms and signs of macro-and micro-malnutrition.

Keywords: Carbohydrates, fats, lipids, macronutrients, malnutrition, micronutrients, minerals, nutrition, protein, vitamins

DOI: https://doi.org/10.47391/JPMA.25-78

Changing Trends

Malnutrition has always been endemic to mankind. Various types of malnutrition, including protein-energy malnutrition, and micronutrient deficiency, are well reported in literature.[1] In recent years, however, the character of malnutrition has changed dramatically.[2] Thanks to improved food security, the prevalence of protein-energy deficiency has reduced markedly. The same, however, cannot be said for protein sufficiency. A very large proportion of people across the world subsist on high carbohydrate diets, with inadequate intake of good quality or high biological value protein. This state of malnutrition is compounded by micronutrient inadequacy, in the form of vitamin and/or mineral deficiency. This situation, termed as hidden hunger, highlights the cryptogenic presentation of micronutrient malnutrition.[3,4]

Micro-Malnutrition

The term 'masked malnutrition' is apt, as it underscores the mask, or masquerade, with which micronutrient deficiencies can present. Dermatological, neurological, haematological, musculoskeletal and metabolic: a wide variety of illnesses can occur due to micro malnutrition. An astute clinical sense, along with focussed, well interpreted investigations, is required to diagnose and manage such dysfunction.

Sarcopenic Obesity

Yet another aspect of masked malnutrition is sarcopenic obesity.[5] Obesity and overweight are considered as disorders of over, or 'mal-nutrition. The umbrella syndrome of obesity, however, includes multiple subtypes of disease. These include sarcopenia, which is a multifactorial condition with a strong component of protein malnutrition. Obesity is also associated with micronutrient disbalance. In fact, deficiency of certain minerals and vitamins, has been shown to be associated with an increased risk of obesity. Obesity may also present as hidden obesity, with high fat percentage but normal body mass index.[6]

Lipokathexis

One example of "tissue malnutrition" is lipokathexis.[7] This condition is characterized by low circulating levels of lipids in spite of excessive fat store. This term can be used to describe diseases such as Tangier's disease and metabolically healthy obesity. The Fat Paradox may partly explain the obesity paradox as well.

Soil Malnutrition

The concept of masked malnutrition is not limited to humans. The one World One Health concept suggests that our health is entwined with that of our environment, and the flora and fauna that co-inhabit our planet Earth. A malnourished soil grows malnourished plants, which in turn are unable to provide adequate nutrition to the animals and human beings that feed upon them.[8] This, too, is masked malnutrition: the underlying cause of malnutrition has been masked. Most rice-farming soils, for example, are reported to be deficient in zinc.

Oedematous Malnutrition

Another important but under-recognized form of masked malnutrition is seen in patients with chronic kidney disease (CKD), especially in stages 4/5 and those on dialysis (CKD 5D). These patients often present with

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Table: Masked malnutrition.

Hidden hunger
• Vitamin deficiency
• Mineral deficiency
Fluid malnutrition
• Dehydration
• Electrolyte deficiency
Macro-malnutrition
• Sarcopenic obesity
• Subclinical kwashiorkor
Oedematous malnutrition
• Nephrotic syndrome
• CKD stage 4/5/5D
Laboratory surrogates
• Non-thyroidal illness (low T3, T4, TSH)
• Non-gonadal illness (low LH, FSH, gonadal hormones)

oedema, giving a falsely reassuring impression of normal or even increased body weight. However, the retained fluid conceals a significant depletion of lean body mass and fat stores which are hallmarks of protein-energy wasting (PEW) and sarcopenia.[9] This phenomenon can delay the recognition of malnutrition and impair timely intervention (The CKD paradox). Oedema may also dilute serum markers such as albumin, further masking the severity of nutritional deficiency. Clinical assessment in these patients must go beyond body weight and BMI, incorporating subjective global assessment (SGA), bioimpedance analysis, and muscle strength testing. A similar "masking" may occur in untreated or resistant nephrotic syndrome, where patients remain persistently oedematous despite progressive malnutrition.

Malnutrition As A Mask

Malnutrition often acts as a mask for various diseases. Low levels of protein may reduce serum creatinine levels, and delay the diagnosis of chronic kidney disease. Low albumin levels can lead to alterations in laboratory function tests, and confound the diagnosis of various hormonal diseases.[10]

Sick euthyroid syndrome, or non-thyroidal illness, and non-gonadal illness, are examples of such situations. Malnutrition can also lead to hypoglycaemia, and malnutrition-induced ketosis, thus masking the correct diagnosis of diabetes and its acute metabolic complications. Hypoalbuminaemia, a differential diagnosis of oedema, may confuse the clinical presentation of renal, hepatic or cardiac disease.[11]

Micronutrient malnutrition may lead to subtle clinical presentations. Nutritional neuropathy may coexist with other causes of nerve damage, and may delay efforts at identifying the underlying. This may be termed as micro-masking.

Summary

Malnutrition continues to present in clinical practice in various guises. Primary care physicians should be aware of the possibility of malnutrition being masked by other diseases, or masking other conditions. This will become more important in the near future, as obesity increases in prevalence. Both obesity per se, and obesity management, are associated with various forms of malnutrition. These should be understood, unmasked, confirmed and corrected, in order to ensure optimal health. Special attention must also be paid to oedematous patients with CKD, where normal or elevated body weight may conceal severe PEW and sarcopenia.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

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