The Potential Role of B-Hydroxy-B-Methylbutyrate in Preventing Muscle Loss in Chronic Diseases

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Editorial

Loss of lean body mass is apparent in many chronic diseases, such as cancer, chronic obstructive pulmonary disease, and heart failure. The loss is a combined consequence of clinical conditions, loss of appetite, and lack of physical activity. In addition, even short-term hospitalization would increase the risk for loss of lean body mass [1,2]. It has been shown that this malnutrition state significantly increased the length of hospitalization, readmission rate, and mortality [2,3]. With the high incidence of loss of lean body mass, even in the presence of enteral and/or parental nutrition support, dietary supplements that could prevent muscle loss under stressful conditions may be helpful in these patients.

β-hydroxy-β-methylbutyrate (HMB), a leucine metabolite, is a popular supplement in exercising populations. HMB has been shown to be effective in augmenting the gain in lean body mass in young and old subjects, in combination with resistance training [4-6]. HMB can increase muscle protein synthesis by activating mammalian target of rapamycin (mTOR) [7]. HMB can also attenuate muscle protein breakdown by inhibiting ubiquitin-mediated autophagy [8-10]. Its anti-catabolic effect has drawn interest from clinical settings. We have shown that a short-term HMB supplementation had anti-catabolic effect and improved pulmonary function in chronic obstructive pulmonary disease patients in an intensive care unit setting [11]. HMB supplementation also improved nitrogen balance in critically injured [12] and hospitalized elderly patients [13]. Moreover, supplementation of HMB, arginine, and glutamine increased fat-free mass in advanced cancer [14] and Human immunodeficiency virus (HIV)-infected patients [15].

A recent meta-analysis has revealed that HMB can preserve muscle mass in generally healthy older adults [16]. With the growing evidence of its anti-catabolic effect in various chronic diseases, HMB supplementation should receive more attention in both clinical settings and scientific research.

Reference


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