Global Journal of Physical Medicine & Rehabilitation

Global Scientific Library

Commentary

# Adequate Judgment and Management for Elderly Patients with Sarcopenia from Various Points of View

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## Abstract

Sarcopenia has been recently in focus for elderly people, and Asian Working Group for Sarcopenia (AWGS) and European Working Group on Sarcopenia in Older People 2 (EWGSOP2) have an important role. The causes of sarcopenia include aging, underactivity, malnutrition, illness, hospitalization, medicines and so on. For diagnosis, several inventories can be applied such as Mini Nutritional Assessment (MNA). For the elderly with sarcopenia, several steps would be recommended as follows: i) evaluate nutritional status and the causes of sarcopenia, ii) eliminate the cause and approach nutrition therapy together, iii) a target energy and nutrition amount is secured, iv) nutritional intervention will be started such as branched chain amino acids (BCAA) including valine, leucine and isoleucine.

**Keywords:** Sarcopenia; Asian working group for sarcopenia; European society of clinical nutrition and metabolism; European working group on sarcopenia in older people 2; Mini nutritional assessment; Branched chain amino acids

## Abbreviations

AWGS: Asian Working Group for Sarcopenia: ESPEN: European Society of Clinical Nutrition and Metabolism; EWGSOP2: European Working Group on Sarcopenia in Older People 2; MNA: Mini Nutritional Assessment; BCAA: Branched Chain Amino Acids

In recent years, sarcopenia in the elderly has been in focus. The Asian Working Group for Sarcopenia (AWGS) defined sarcopenia as age-related loss of muscle mass, plus low muscle strength, and/or low physical performance [1]. It is related to several factors such as low physical function, BMI, android fat, albumin and so on [2]. For the therapy of sarcopenia, there have been main methods of lifestyle interventions, nutritional supplementation and exercise for years [1].

Among the elderly living in the residence area, the prevalence of malnutrition and sarcopenia has been estimated to be about 10%, respectively [3,4]. Most of the independent elderly people who can walk and visit the outpatient department do not usually have these problems. Then, this is the group that we aim to prevent the onset of sarcopenia with maintaining good nutrition. For these people, there was no intervention studies that attempted to prevent sarcopenia with nutritional guidance alone [5]. On the other hand, investigation would be necessary for people with sarcopenia from nutritional point of view.

A cross-sectional study found that the prevalence of sarcopenia in men was associated with lack of dietary diversity in Japanese (n=1074) [5]. In a study of elderly Asian women, the amount of protein intake was divided into 4 groups, and skeletal musclemass was increased in the group with high intake of protein [6]. Protein intake amount in median and the third quartile were 0.96 g / kg / day and 1.18 g / kg / day, respectively. In another study, a protein intake was 1.2 g/kg/day in an intervention study in which skeletal muscle mass was increased in obese people with sarcopenia [5]. Based on the above, it is recommended to take 1.0 g/kg/day or more of protein per proper weight.

There was a study to explore the association of malnutrition and sarcopenia, according to the guidelines Global Leadership Initiative of Malnutrition (GLIM), European Society of Clinical Nutrition and Metabolism (ESPEN) and European Working Group on Sarcopenia in Older People 2 (EWGSOP2) [4]. A significantly higher risk was found during 4-year follow-up. As the results of adjusted Hazard Ratio (aHR), GLIM showed 3.23 for sarcopenia, 2.87 for severe sarcopenia, and ESPEN showed 4.28 for sarcopenia and 3.86 is for severe sarcopenia [4].

Several multiple cross-sectional studies were present concerning the relationship between frailty and undernutrition [7,8]. Among these, the evaluation for nutritional condition was conducted by the Mini Nutritional Assessment (MNA) [7,8].

In order to study the relationship among several factors, elder frailty patients of University hospital in Rome were evaluated [9]. They were multidimensional geriatric evaluations, such as MNA, Activity of Daily Living (ADL), Instrumental Activity of Daily Living (IADL), Mini–Mental State Examination (MMSE), Geriatric Depression Scale (GDS), Cumulative Illness Rating Scale for Geriatrics (CIRS-G), Survey of Health, Ageing and Retirement in Europe-Frailty Index (SHARE-FI) [9]. Thus, sarcopenia has been evaluated from multiple points of view.

Older people with sarcopenia are more likely to have malnutrition. In addition to aging, causes of sarcopenia include underactivity, malnutrition, illness, hospitalization, medicines and so on [10]. The effectiveness of nutritional intervention depends on the presence or cause of the undernutrition. Therefore, it is necessary to identify causes other than malnutrition. To date, there have been no intervention trials of nutritional therapy alone for the elder patients with sarcopenia. However, improvement of sarcopenia by a combination of nutrition therapy and exercise therapy has been reported [11].

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**Received:** May 11, 2020; **Accepted:** May 27, 2020; **Published:** Jun 10, 2020

**Citation:** Bando H, Murakami M, Moriyasu A. Adequate Judgment and Management for Elderly Patients with Sarcopenia from Various Points of View. J Phy Med Rehab. 2020; 3:112.

In addition to the administration of protein, vitamin D, micronutrients with antioxidant action, and Polyunsaturated Fatty Acid (PUFA) with anti-inflammatory action are also found as factors related to malnutrition [12]. However, there are still many problems to be solved such as the daily intake, timing, long-term effect, and others [13]. Research on proper usage and dosage of nutrients involved in sarcopenia treatment will be expected in the future.

After the diagnosis of sarcopenia, the important point would be to consider the treatment goals. Should it be recovered, can it be recovered, or can it not be recovered? [1-3].

The first is iatrogenic matters in relation to hospitalization, drugs and lack of care. The second is due to low activity and malnutrition, which may be reversible if activity improves and nutrient intake returns to normal levels. Third, there are cases where the underlying diseases are malignant tumors, cachexia, chronic inflammatory diseases, and neuromuscular diseases [1,2,5]. In these cases, it is difficult to improve or cure the original diseases, so that recovery seems to be also difficult. Therefore, try to intervene so as to delay the progression of sarcopenia as much as possible.

The above is the principle, but in actual clinical practice, there are many overlapped cases. It is necessary to examine the contents according to each case and to carry out nutritional intervention.

Protein occupies most of the components of skeletal muscle. It is the most influential nutrient in the treatment of sarcopenia. In particular, essential amino acids cannot be synthesized in the body, and then sufficient amount should be provided for skeletal muscle synthesis [14]. Of the essential amino acids, three types of branched chain amino acids (BCAA), namely valine, leucine, and isoleucine, are important. These materials can synthesize skeletal muscle, become also an energy source, and have an inhibitory effect on the decomposition of muscle protein [15].

Among them, leucine can be especially expected to increase skeletal muscle. In the metabolism of the cells, leucine activates the mammalian Target of Rapamycin (mTOR) system pathway to promote protein synthesis. It also contributes to activation of the entire cell growth promoting pathway via insulin. However, it has been reported that the concentration of valine and isoleucine in blood would be decreased when leucine alone is administered [16]. Therefore, administration of BCAA rich in leucine may be effective for various clinical cases [17].

Dietary protein provides amino acids that can be used for protein synthesis. Following ingestion, dietary protein is digested and absorbed. It is found before dietary protein-derived amino acids become available in circulation [18]. Amino acids are subsequently available to peripheral tissues including skeletal muscle.

Nutritional guidance for the elderly may be divided into two cases. One is for the elderly without sarcopenia. Recommended diet is to increase protein intake based on the energy intake required to maintain the present status. Another is for elderly people with sarcopenia, in which personalized nutritional support would be necessary. First, the nutritional status and the causes of sarcopenia would be evaluated. Second, eliminate the cause and approach nutrition therapy together. Third, a target energy amount is set, a nutrition amount is secured, and nutritional intervention will be performed so that larger amount of BCAA can be taken.

In summary, the prevention and treatment of sarcopenia are cannot be completed only by the physician. Multidisciplinary interventions related to sarcopenia-related activities, nutrition, illness, hospitalization, and medicine will be required.

## References


1. Chen LK, Woo J, Assantachai P, Auyeung TW, Chou MY, Iijima K, et al. (2020) Asian Working Group for Sarcopenia: 2019 Consensus Update on Sarcopenia Diagnosis and Treatment. J Am Med direct Assoc. 21: 300-307.e2.
2. Abbas H, Perna S, Shah A, Al-Mannai M, Gasparri C, Infantino V, et al. (2020) Risk factors for 5-year mortality in a cohort of elderly patients with sarcopenia. Experiment Gerontol 136: 110944.
3. Shimokata H, Shimada H, Satake S, et al. (2018) Chapter 2 Epidemiology of sarcopenia. GeriatrGerontol Int. 1: 13-22.
4. Beaudart C, Sanchez-Rodriguez D, Locquet M, Reginster JY, Lengelé L, Bruyère O (2019) Malnutrition as a Strong Predictor of the Onset of Sarcopenia. Nutrients 11: 2883.
5. Kuzuya M, Sugimoto K, Suzuki T, et al. (2018) Chapter 3 Prevention of sarcopenia. Geriatr Gerontol Int. 18: 23-27.
6. Kim YH, So WY (2016)A low arm and leg muscle mass to total body weight ratio is associated with an increased prevalence of metabolic syndrome. Techonol Health Care 24: 655-663.
7. Boulos C, Salameh P, Barberger-Gateau P (2016) Malnutrition and frailty in community dwelling older adults living in a rural setting. Clin Nutr 35: 138-143.
8. Dorner TE, Luger E, Tschinderle J et al. (2014) Association between nutritional status (MNA(R)-SF) and frailty (SHARE-FI) in acute hospitalised elderly patients. J Nutr Health Aging 18: 264-269.
9. ValentiniA, Federici M, Cianfarani M A, Tarantino U, Bertoli A (2018) Frailty and nutritional status in older people: the Mini Nutritional Assessment as a screening tool for the identification of frail subjects. Clinical interventions in aging 13: 1237-1244.
10. Cruz-Jentoft AJ, Sayer AA (2019) Sarocopenia. Lancet 393: 2636-2646.
11. Liao CD, Chen HC, Huang SW, Liou TH (2019) The Role of Muscle Mass Gain Following Protein Supplementation Plus Exercise Therapy in Older Adults with Sarcopenia and Frailty Risks: A Systematic Review and Meta-Regression Analysis of Randomized Trials. Nutrients 11: 1713.
12. Robinson SM, Reginster JY, Rizzoli R, Shaw SC, Kanis JA, Bautmans I, et al. (2018) Does Nutrition Play a Role in the Prevention and Management of Sarcopenia? Clin Nutr 37: 1121-1132.
13. Perna S, Alalwan TA, Al-Thawadi S, Negro M, Parimbelli M, Cerullo G, et al. (2020) Evidence-Based Role of Nutrients and Antioxidants for Chronic Pain Management in Musculoskeletal Frailty and Sarcopenia in Aging. Geriatrics 5: 16.
14. Takeuchi I, Yoshimura Y, Shimazu S, Jeong S, Yamaga M, Koga H. (2019) Effects of branched-chain amino acids and vitamin D supplementation on physical function, muscle mass and strength, and nutritional status in sarcopenic older adults undergoing hospital-based rehabilitation: A multicenter randomized controlled trial. GeriatrGerontol Int. 19: 12-17.
15. Merli M, Lattanzi B, D'Ambrosio D, Fabrini N, Liguori A (2020) Nutritional Therapy in the Management of Physical Frailty and Sarcopenia. In: Tandon P, Montano-Loza A. (eds) Frailty and Sarcopenia in Cirrhosis. P77-85. Springer, Cham. Print ISBN 978-3-030-26225-9, Online ISBN 978-3-030-26226-6.


**Citation:** Bando H, Murakami M, Moriyasu A. Adequate Judgment and Management for Elderly Patients with Sarcopenia from Various Points of View. J Phy Med Rehab. 2020; 3:112.

16. Matsumoto T, Nakamura K, Matsumoto H, et al. (2014) Bolus ingestion of individual branched-chain amino acids alters plasma amino acid profiles in young healthy men. Springerplus. 3: 35.

17. Gorissen SHM, Phillips SM (2019) Branched-Chain Amino Acids (Leucine, Isoleucine, and Valine) and Skeletal Muscle. Nutrition and Skeletal Muscle. 263-278.

18. Burke LM, Winter JA, Cameron-Smith D, Enslen M, Farnfield M, Decombaz J (2012) Effect of intake of different dietary protein sources on plasma amino acid profiles at rest and after exercise. Int J Sport Nutr Exerc Metab. 22: 45262.

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