



Nutrition for elderly individuals during the COVID-19 pandemic

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Received 14th August 2019,
Accepted 19th August 2019

Link to DOI:
10.25220/WNJ.V04.i1.0001

Journal Website:
www.worldnutrijournal.org

Introduction

As Japan has been facing an increasingly aged society ahead of the rest of the world, much interest has been focused on interventions for treating frailty and sarcopenia to extend healthy life expectancy in recent years. The COVID-19 pandemic has led to a crisis in healthcare systems all over the world. It has had a huge impact on not only public health but also the global economy. Due to the lack of effective vaccination and pharmacological antiviral intervention, pandemic control is dependent on public health measures. These measures have basically aimed to decrease social activities and face-to-face communication, including the restriction of public gatherings and compulsory stay-at-home policies.¹ Even though these strategies are effective in controlling the pandemic, social and economic influences have obviously affected vulnerable groups of people, including elderly individuals. Therefore, it is important to enhance the effectiveness of pandemic control measures while

minimizing secondary negative consequences. This article aimed to describe the importance of maintaining good nutritional and mental health for elderly individuals during the COVID-19 pandemic, with a particular focus on frailty management.

Elderly individuals are vulnerable during in the COVID-19 pandemic

Several studies support an age gradient in the severity and mortality of COVID-19.²⁻⁸ It is known that human immunity is supported by nutritional status. In this regard, the immune strength of malnourished and sarcopenic individuals against bacterial and viral infections is lower. In general, elderly individuals tend to have multiple comorbidities, altered body composition (such as sarcopenia), decreased swallowing and ingesting ability, and decreased cognitive function. Moreover, they are disadvantaged socioeconomically. In fact, the rates of severe disease were significantly different depending on the age group.⁹ Furthermore, mortality was also higher in the older age groups, and comorbidities, such as hypertension, diabetes, cardiovascular disease, chronic respiratory disease, and cancer, were associated with an increased risk of death.² In this regard, maintaining good nutritional status as well as preventing infection is important for elderly individuals.

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Nutrition, physical activity, and socialization are important factors for frailty management to enhance physical and mental resilience. However, these three factors are disturbed now because current public health measures can exert unintended adverse secondary effects through a wide range of downstream societal consequences.³ The restriction of social activities induces physical frailty, or sarcopenia. Physical distancing increases social isolation and loneliness, leading to depression, cognitive decline, and exacerbations of chronic diseases.¹⁰⁻¹² A report published by the Japan Day-service Welfare Association showed that seniors' activities of daily living (ADL) had deteriorated due to reduced operation of healthcare and social services for elderly individuals.¹³ In general, aging is the primary cause of sarcopenia and older adults lose muscle mass as they age. Rates of sarcopenia have accelerated rapidly with restrictions in social activities. Sarcopenic change results in not only decreased ADL but also blood flow stagnation, glucose tolerance, and immune weakness. Taken together, from a nutritional intervention perspective during this COVID-19 pandemic, nutritional care for enhancing immunity to reduce the infection rate and severity and preventing the progression of frailty is important for elderly individuals.

Nutritional care for elderly individuals during the COVID-19 pandemic

Having a well-balanced diet three times a day regularly is essential for our health. It has been reported that malnutrition can be an independent prognostic factor for influenza infection.^{14,15} The latest food uptake standard issued by the Japan Ministry of Health, Welfare and Labor in 2020 recommended energy intake from protein be increased to 15-20% for those over 65 years old when considering the nutritional management of sarcopenia. The recommended daily protein intake is 1.2-1.5 g/kg body weight. As elderly individuals are generally resistant to muscle anabolism, they need to consume good-quality proteins containing branched-chain amino acids (BCAAs). BCAAs play an important role in muscle synthesis to repress protein degradation and activate protein synthesis. BCAAs are also reported to have roles in gut health, immune function, and insulin sensitivity.¹⁶⁻¹⁸ Tuna,

bonito, poultry, beef, egg, beans, and milk are all rich in BCAAs. Recently, among BCAAs, leucine and β -hydroxy- β -methylbutyrate (HMB, its metabolite) have attracted attention for the effective synthesis of muscle proteins [19]. Vitamins and trace elements tend to run short when a balanced diet is destroyed, and their deficiency hinders immune function. It has been reported that vitamin D deficiency is related to the development of infectious diseases, such as influenza infection, human immunodeficiency virus infection, and hepatitis C virus hepatitis.^{20,21} We presume that intake of a sufficient amount of vitamin D plays a role in preventing COVID-19 infection, since vitamin D deficiency is common among elderly individuals.^{22,23} Vitamin A may also play a role in protecting from infection and is considered to be important among pediatric infectious diseases.²⁴ Other vitamins, such as E, B6, B12, selenium, and zinc, are also related to immune function, and zinc deficiency has been shown to increase susceptibility to various pathogens.²⁵

Probiotics are beneficial in promoting a healthy gut and immune system.²⁶ Probiotics can be found in cultured dairy products and fermented products. Vitamin D is naturally found in fatty fish, such as salmon and tuna, and in small amounts in dairy products, egg yolks, and mushrooms. Vitamin A can be found in many fruits and vegetables, such as carrots, sweet potatoes, tomatoes, broccoli, spinach, mango, and peppers.

Adding seafood, fruits, vegetables, dairy products, and beans into the diets of elderly individuals will ensure adequate intake of these immune-boosting minerals.

In addition to the nutritional care described above, in order to avoid losing appetite, routine exercise is important for elderly individuals. In terms of frailty management, enriching the lives of elderly individuals with proper exercise and social relationships should be taken into consideration. Incorporating information and communications technology and social networking services may play a role in these achievements as communication tools and should be promoted positively among older adults during the COVID-19 pandemic.

Conclusion

The COVID-19 pandemic has led to the declaration of a state of emergency for the first time in Japan. We have been seized with fear under the strict restriction of our daily lives for pandemic control. I have summarized the requisite nutritional care to preserve the physical resilience of elderly individuals, which also aims to manage frailty. Elderly individuals should be encouraged to have a healthy and active lifestyle during this pandemic.

Conflict of Interest

Authors declared no conflict of interest regarding this study.

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