Migration Letters

Volume: 19, No: S8 (2022), pp. 745-752

ISSN: 1741-8984 (Print) ISSN: 1741-8992 (Online)

www.migrationletters.com

Nutritional Support Of The Elderly Patient: The Role Of The Nurse

Hanan Bader Alanzi[1] , Zeinah Turki Algahtani[2] , Maha Hmoud Alenazy[3] , Rajsa Nasar Al Doseri[4] , Ashwaq Mubarak Nasser[5] , Nowayer Mohammad Al-Dosari[6] , Nora Mubark Nasser Al-Dosari[7] , Renad Mohammad Qasem Algahtani[8]

Introduction

The advent of dietary supplements has meant that individuals do not need to rely solely on foods to provide the essential nutrients for health (1). Dietary supplements are widely available to consumers worldwide and use of these products has significantly increased during the past two decades (2).

Aging is often accompanied by increased nutritional risk that can cause or exacerbate health conditions. Undernutrition in older adults can be due to reduced energy and food intake, biological changes in the digestive system, medical and psychological conditions, polypharmacy, and social issues such as poverty and the inability to shop and prepare meals. DSs can provide nutrients that may be lacking or inadequate in the diet and can help older adults meet recommended intake targets (3). In particular, the use of dietary supplements is prevalent in older adults, many of whom are residing in institutions. Older adults have specified their use of supplements for maintaining the health of their heart, bones, joints, and eyes (2).

But, the additional nutrients provided by DSs can also potentially lead to intakes exceeding the Tolerable Upper Intake Level (UL), especially for nutrients that are fortified in the US food supply (4–6). Moreover, some botanical and herbal DSs cause adverse reactions with prescription and over-the-counter drug[1]s. The high concurrent use of prescription medications and DSs in older adults may increase the risk of drug-nutrient and other drug-supplement interactions. Thus, DSs have the potential to be both beneficial and harmful to health (2,3).

It is difficult for medical practitioners to know the use of nonprescription medications as these are used at the discretion of the patients. In addition, previous reports suggested that many patients taking nonprescription medication do not tend to disclose the use of these drugs to their physician (7). Nutrient supplements are widely available in pharmacies and grocery stores where pharmacists are highly accessible (8). In the United States, dietary supplement (DS) use is widespread, with over half of adults reporting use, and the highest use reported in older adults (3). It is the vitamin and mineral supplements that are among the most popular and commonly used dietary supplements. Regular consumption of

[1]Nurse, South alnadeem health care center , Riyadh
[2]Nurse, The first health pool, School Health, Riyadh
[3]Nurse, Nadwa Health Center, Riyadh
[4]Nurse, Al-Ladaam Northern Health Center, Wadi Al-Dawasir
[5]Nurse, Wadi Al-Dawasir Hospital, Wadi Al-Dawasir
[6]Nurse, -Al-Khamasin Health Center, Wadi Al-Dawasir
[7]Nurse, -Al-Khamasin Health Center, Wadi Al-Dawasir
[8]Nurse, Al Fawaz Health Center, Riyadh

multivitamin and mineral supplements has been reported among more than 30% of the US adult population (2).

The following paper will present some of the dietary supplements that used by the elderly and the most important details about it in addition to some related studies.

Omega-3 fatty acid:

Benefits:

The benefits of w-3FA have been evaluated in a variety of diseases and health conditions. The diseases of interest are often driven by the evidence of chronic inflammation or the organs with high w-3FA content, which include the retina, brain, and heart. Research with higher-quality data and results in disease states that affect older adults include age-related macular degeneration (AMD), cardiovascular diseases, atrial fibrillation, and Alzheimer disease (8). Current evidence suggests that EPA and DHA supplementation reduces death associated with cardiovascular events or stroke, or risk of atrial fibrillation after CABG, though it is unclear whether specific patient groups benefit more than others. Routine w-3FA supplementation does not appear to alter the course of other cardiovascular diseases, AMD, or Alzheimer disease(8).

Daily intake:

1.6 g for males and 1.1 g for females (9).

Maximum dose:

3 g/d (10).

Source (8,11):

1. Fish and shellfish
2. Plant oils (Flaxseed oil, Canola oil)
3. Cheese
4. Nuts
5. Potatoes
6. milk
7. Egg

Symptoms of deficiency:

A deficiency of essential fatty acids—either omega-3s or omega-6s—can cause rough, scaly skin and dermatitis (9).

Symptoms of higher dose:

The adverse events related to w-3FA supplements are fairly benign in older adults, with GI disturbances being the most common adverse effect (8). Side effects of omega-3 fatty acid and fish oil supplements in recommended doses are minimal, but may include mild gastrointestinal discomfort, nausea, diarrhea and headache. More clinically significant side effects include platelet dysfunction and an increased risk of bleeding, particularly in patients on anticoagulant and antithrombotic therapy (10, 11).

Types of omega-3 Supplements (8):

Ethyl Esters of EPA and DHA: are oral capsules, it brand names are Lovaza, Omacor, Omtryg and others.

Ethyl Ester of EPA: are oral capsules, it brand name is Vascepa.

EPA and DHA Carboxylic Acids: are oral capsules, it brand name is Epanova.

Product in market:

Studies:

Study 1: found a significant increase in executive functions after LC-n3-FA compared with placebo (P = 0.023). In parallel, LC-n3-FA exerted beneficial effects on white matter microstructural integrity and gray matter volume in frontal, temporal, parietal, and limbic areas primarily of the left hemisphere, and on carotid intima media thickness and diastolic blood pressure. Improvements in executive functions correlated positively with changes in omega-3-index and peripheral brain-derived neurotrophic factor, and negatively with changes in peripheral fasting insulin. This double-blind randomized interventional study provides first-time evidence that LC-n3-FA exert positive effects on brain functions in healthy older adults, and elucidates underlying mechanisms (12).

Study 2: Most trials reported that fish oil significantly reduced all-cause mortality, myocardial infarction, cardiac and sudden death, or stroke. Primary prevention of cardiovascular disease was reported in 1 RCT, in 25 prospective cohort studies, and in 7 case-control studies. No significant effect on overall deaths was reported in 3 RCTs that evaluated the effects of fish oil in patients with implantable cardioverter defibrillators. Most cohort studies reported that fish consumption was associated with lower rates of all-cause mortality and adverse cardiac outcomes. The effects on stroke were inconsistent. Evidence suggests that increased consumption of n-3 FAs from fish or fish-oil supplements, but not of alpha-linolenic acid, reduces the rates of all-cause mortality, cardiac and sudden death, and possibly stroke. The evidence for the benefits of fish oil is stronger in secondary- than in primary-prevention settings. Adverse effects appear to be minor (13).

Study 3: The available data encourage higher intakes of omega-3 PUFAs in the diet or via specific supplements. More studies are needed to confirm the role of omega-3 FAs in maintaining bone health and preventing the loss of muscle mass and function associated

with ageing. In summary, omega-3 PUFAs are now identified as potential key nutrients, safe and effective in the treatment and prevention of several negative consequences of ageing (14).

Study 4: The out-comes to be evaluated after supplementation with EPA andDHA were mental well-being, physical health, psychologicalhealth and social relationship with no differences observedreagardless of high vs. moderate dose(39,41 – 42,50,51).As for mortality an inverse age-and energy-adjusted associ-ation between total mortality and fish intake was found. Ingeneral, a tendency toward reduction in all-cause mortalityis observed after EPA and DHA supplementation although the positive effect seems to be within a better dietary andquality of life patterns (15).

Vitamin E:

Benefits (8,16):

1. antioxidant
2. has roles in anti-inflammatory processes
3. inhibition of platelet aggregation
4. immune enhancement.

Dairy intake:

15 mg, (22.4 IU) (16).

Maximum dose: 1,000 mg, (1,500 IU)

Source: Nuts, seeds, vegetable oils, green leafy vegetables, fortified cereals, soybean, canola, and corn (16).

Symptoms of deficiency: peripheral neuropathy, ataxia, skeletal myopathy, retinopathy, and impairment of the immune response (16).

Symptoms of higher dose:

Over dose of vitamin E has a tendency to cause bleeding. vitamin E supplements (400 IU/day) may harm adult men in the general population by increasing their risk of prostate cancer (16). High doses of vitamin E might increase the risk of bleeding (by reducing the blood's ability to form clots after a cut or injury) and of serious bleeding in the brain (known as hemorrhagic stroke) (17).

Types of vitamin E Supplements:

Vitamin E from natural (food) sources is commonly listed as "d-alpha-tocopherol" on food packaging and supplement labels (8,16,17).

Product in market:

Studies:

Study 1: There is conflicting evidence that antioxidants contribute to maintaining cognitive function in elderly subjects. This study investigated whether vitamin E plasma levels are related to the presence of dementia and cognitive impairment in a population-based cohort study conducted in Italy. A total of 1033 participants aged at least 65 years received clinical and neuropsychological examinations, donated blood for vitamin E analysis and had their diets assessed. Participants with plasma vitamin E levels in the bottom tertile had a significantly higher probability of being demented (OR 2.6, 95% CI 1.0–7.1) and also of suffering from cognitive impairment (OR 2.2, 95% CI 1.2–4.2) compared to those in the highest vitamin E tertile after adjustment for age, gender, education, lipid levels, energy intake, vitamin E intake, and smoking. This study supports the notion that higher vitamin E plasma levels might provide significant protection against cognitive impairment and dementia in elderly subjects (18).

Study 2: Vitamin E is a dietary compound that functions as an antioxidant scavenging toxic free radicals. Evidence that free radicals may contribute to the pathological processes of cognitive impairment including Alzheimer's disease has led to interest in the use of vitamin E in the treatment of mild cognitive impairment (MCI) and Alzheimer's dementia (AD). This study aimed to assess the efficacy of vitamin E in the treatment of AD and prevention of progression of MCI to dementia. and found that there is no convincing evidence that vitamin E is of benefit in the treatment of AD or MCI. Future trials assessing vitamin E treatment in AD should not be restricted to alpha-tocopherol (19).

Study 3: Secondary analyses of 2 randomized controlled trials and supportive epidemiologic and preclinical data indicated the potential of selenium and vitamin E for preventing prostate cancer. this study aimed to determine whether selenium, vitamin E, or both could prevent prostate cancer and other diseases with little or no toxicity in relatively healthy men. And found that Selenium or vitamin E, alone or in combination at the doses and formulations used, did not prevent prostate cancer in this population of relatively healthy men (20).

Vitamin D:

Benefits (8,21):

1. promotes calcium absorption in the gut
2. maintains adequate serum calcium and phosphate concentrations to enable normal mineralization of bone
3. prevent hypocalcemic tetany
4. reduction of inflammation
5. regulating innate and adaptive immunity
6. modulates cellular differentiation
7. has a role in the maturation in the immune and musculoskeletal systems.
8. Has broad epigenomic effect.

Dairy intake:

600 international units (IU) up to age 70, and 800 IU after age 70 (21).

Maximum dose:

10,000 IU/day (21).

Source (21):

1. sunlight
2. fatty fish (such as salmon, tuna, and mackerel)
3. fish liver oils
4. beef liver
5. cheese
6. egg yolks.

Symptoms of deficiency:

In adults, vitamin D deficiency can lead to osteomalacia, resulting in weak bones(8,21). Overt hypocalcemia is uncommon in vitamin D deficiency because the body tries to maintain a normocalcemic state by mobilizing calcium from bone (8).

Symptoms of higher dose:

Vitamin D toxicity can cause non-specific symptoms such as anorexia, weight loss, polyuria, and heart arrhythmias. More seriously, it can also raise blood levels of calcium which leads to vascular and tissue calcification, with subsequent damage to the heart, blood vessels, and kidneys (21).

Types of vitamin D Supplements (8,21):

D2 (ergocalciferol), oral tablet

D3 (cholecalciferol), oral tablet

Product in market:

Studies:

Study 1 : Vitamin D deficiency is a common, serious medical condition that significantly affects the health and well-being of older adults. Evidence has confirmed the association between vitamin D and osteoporosis; however, at this time, RCTs are needed to determine whether providing vitamin D can help to prevent, treat, or ameliorate the chronic conditions of aging such as cognitive decline, depression, cardiovascular disease, hypertension, type 2 diabetes, and cancer. A comprehensive systematic review recently published reported similar findings. Although new studies have shown promising data regarding vitamin D's role in various health outcomes, such as bone and cardiovascular health, cancer, and the immune system, the findings are inconsistent and no firm conclusions can be drawn at this time. As our nation's older adult population continues to grow, establishing universal guidelines for testing and treating vitamin D deficiency is needed. Although some have suggested the need to specify standard vitamin D values for certain disorders, much work in this area is warranted. Finally, research to examine the dosing of vitamin D supplements necessary to prevent the chronic diseases of aging would have significant benefit for future generations (22).

Study 2: Besides its well-known effect on bone metabolism, recent researches suggest that vitamin D may also play a role in the muscular, immune, endocrine, and central nervous systems. Double-blind RCTs support vitamin D supplementation at a dose of 800 IU per day for the prevention of falls and fractures in the senior population. Ecological, case–control and cohort studies have suggested that high vitamin D levels were associated with a reduced risk of autoimmune diseases, type 2 diabetes, cardio-vascular diseases and cancer but large clinical trials are lacking today to provide solid evidence of a vitamin D benefit beyond bone health. At last, the optimal dose, route of administration, dosing interval and duration of vitamin D supplementation at a specific target dose beyond the prevention of vitamin D deficiency need to be further investigated (23).

Study 3: vitamin D and related compounds have been used to prevent osteoporotic fractures in older people. This is the third update of a Cochrane review first published in 1996. This study aimed to determine the effects of vitamin D or related compounds, with or without calcium, for preventing fractures in post-menopausal women and older men. Authors conclude that Vitamin D alone is unlikely to prevent fractures in the doses and formulations tested so far in older people. Supplements of vitamin D and calcium may prevent hip or

any type of fracture. There was a small but significant increase in gastrointestinal symptoms and renal disease associated with vitamin D and calcium. This review found that there was no increased risk of death from taking calcium and vitamin D (24).

References

1. Brownie, S. "Dietary supplement use in the elderly: benefits and risks." Food for the Ageing Population. Woodhead Publishing, 2009. 478-497.
2. Goorang, S., et al. "Profile of use of vitamin and mineral supplements among elderly institutionalized adults: A systematic review." Jour Nursing Home Res 1 (2015): 1-5.
3. Gahche, Jaime J., et al. "Dietary supplement use was very high among older adults in the United States in 2011–2014." The Journal of nutrition 147.10 (2017): 1968-1976.
4. Buhr, Gwendolen, and Connie W. Bales. "Nutritional supplements for older adults: Review and recommendations—Part I." Journal of Nutrition for the Elderly 28.1 (2009): 5-29.
5. Bailey, Regan Lucas, et al. "Examination of vitamin intakes among US adults by dietary supplement use." Journal of the Academy of Nutrition and Dietetics 112.5 (2012): 657-663.
6. Bailey, Regan L., et al. "Dietary supplement use is associated with higher intakes of minerals from food sources." The American journal of clinical nutrition 94.5 (2011): 1376-1381.
7.Masumoto, Shoichi, et al. "Factors associated with the use of dietary supplements and over-the-counter medications in Japanese elderly patients." BMC family practice 19.1 (2018): 20.
8. Mike, Leigh Ann, and Lingtak-Neander Chan. "Nutritional Supplements in Older Adults."
9.DRI. "Institute of Medicine, Food and Nutrition Board, Dietary Reference Intakes: energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein and amino acids." (2005).
10.Kris-Etherton, Penny M., William S. Harris, and Lawrence J. Appel. "Fish consumption, fish oil, omega-3 fatty acids, and cardiovascular disease." circulation 106.21 (2002): 2747-2757.
11.National Institutes of Health. "Livertox: clinical and research information on drug-induced liver injury." Bethesda, MD.: US National Library of Medicine (2017).
12.Witte, A. Veronica, et al. "Long-chain omega-3 fatty acids improve brain function and structure in older adults." Cerebral cortex 24.11 (2013): 3059-3068.
13.Wang, Chenchen, et al. "n− 3 Fatty acids from fish or fish-oil supplements, but not α-linolenic acid, benefit cardiovascular disease outcomes in primary-and secondary-prevention studies: a systematic review." The American journal of clinical nutrition 84.1 (2006): 5-17.
14.Molfino, Alessio, et al. "The role for dietary omega-3 fatty acids supplementation in older adults." Nutrients 6.10 (2014): 4058-4072.
15.Ubeda, Natalia, María Achón, and Gregorio Varela-Moreiras. "Omega 3 fatty acids in the elderly." British Journal of nutrition 107.S2 (2012): S137-S151.
16. Office of Dietary Supplements. National Institutes of Health, Dietary Supplement Fact Sheet: Vitamin E. https://ods.od.nih.gov/factsheets/VitaminE-HealthProfessional/#h6.
17.Office of Dietary Supplements. National Institutes of Health, Dietary Supplement Fact Sheet: Vitamin E. http://ods.od.nih.gov/factsheets/VitaminE-QuickFacts.
18.Cherubini, Antonio, et al. "Vitamin E levels, cognitive impairment and dementia in older persons: the InCHIANTI study." Neurobiology of aging 26.7 (2005): 987-994.
19.Isaac, Mokhtar Gad El Kareem Nasr, et al. "Vitamin E for Alzheimer's dementia and mild cognitive impairment." The Cochrane Database of Systematic Reviews 2012.11 (2012).
20.Lippman, Scott M., et al. "Effect of selenium and vitamin E on risk of prostate cancer and other cancers: the Selenium and Vitamin E Cancer Prevention Trial (SELECT)." Jama 301.1 (2009): 39-51.
21. Office of Dietary Supplements. National Institutes of Health, Dietary Supplement Fact Sheet: Vitamin E. https://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/.
22.Meehan, Meghan, and Sue Penckofer. "The role of vitamin D in the aging adult." Journal of aging and gerontology 2.2 (2014): 60.
23.Bruyère, Olivier, et al. "Effects of vitamin D in the elderly population: current status and perspectives." Archives of public health 72.1 (2014): 32.
23.Avenell, Alison, Jenson CS Mak, and Dianne O'Connell. "Vitamin D and vitamin D analogues for preventing fractures in post-menopausal women and older men." Cochrane Database of Systematic Reviews 4 (2014).