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Assessing the effect of physical activity and dietary pattern on nutritional status of geriatric people

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Abstract

Geriatrics is the age of human life after 65 years and above and during this age of human life there are many physical and psychological changes happening in the human body. During this age proper care should be taken as it would help to delay the occurrence of the disease and also prevent them. This review article tells about the effects of physical activity, role of Calcium, Vitamin-A and Protein in maintaining the nutritional status during old age and some of the psychosocial problems faced by elderly as they age. The nutritional assessing tool most commonly used is the Mini-nutritional assessment guideline which tells about the whole nutritional status of elderly and is the most precise tool to be used for the assessment in geriatrics. Hence if these different cause are studied prior during early geriatric age then it would help to prevent and overcome the disease condition.

Keywords: Geriatrics nutritional assessment, physical activity, psychosocial problems in elderly, nutrients necessary in elderly

Introduction

Aging is a multifaceted process characterised by numerous physical, social and psychological changes appear in humans throughout the lifespan^[1]. The Geriatric age starts from the age 65 years and beyond 65 years. The body's requirement in terms of nutrition and in terms of medicinal support increases if proper care and treatment is not given. The decline in the nutritional status gives invitation to many diseases that could be life threatening. Some of the major diseases that are most commonly found during this age is Diabetes type-2, Blood pressure, Dementia, Coronary Heart Disease, Cancer, Atherosclerosis, Nutrient deficiencies and Malnutrition. This impairs the quality of life by declining the physical and cognitive ability of elderly. Geriatric Nutrition mainly aims to provide nutrition that delays the effect of aging and disease. Functional foods helps mainly to maintain the good nutritional status in elderly as they do not prefer to have diverse dietary pattern^[2]. Functional foods are extremely beneficial food components that are naturally present in the foods and could be added to the regular foods. They could be in the form of powder, tablets, or supplements^[3]. They do not change the taste of food but add more nutrients to food. The studies shows that good nutritional support helps to keep the immune system proper and also helps to delay the onset of disease.

Methodology

In all total 50 review paper were being studied and most relevant 35 papers were taken into consideration for this review article. The review papers were searched on different search engines like Pubmed, Google scholar and Shodhganga. The review papers recently published were taken for the study purpose. The key words used for searching the review article were 'geriatrics', 'nutrition assessment for geriatrics', 'physical activity in elderly', 'deficiencies among elderly', 'MNA guidelines' etc. were searched on the title of the search engine.

Role of Calcium in Elderly

Calcium is the most essential nutrient to carry out almost all human functions. It is the amply available nutrient available in body. Foremost care of strong bones in infancy and in adolescence helps to maintain good bone health in old age. Calcium is 99% found in bones and in teeth and below 1% is in serum. The absorption rate of calcium from food or any supplement is 30% which varies from person to person. Calcium performs various functions such as narrowing of blood vessels, vasodilatation, muscular functions, neural response, intracellular signaling, and secretion of chemical messengers; any change in the serum calcium

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levels would affect the above functions which would make elderly more prone to diseases which are life threatening [4, 5]. Due to dietary habits, both teenage and third age populations frequently have an increase risk of calcium shortage. The danger for adolescents is rising globally as a result of change in dietary pattern. Many teenagers reduce their calcium intake by switching to other dairy products, especially beverages, or by consuming less calcium overall. Teenage eating problems can lead to calcium deficiency in both male and female teens. Numerous factors put the elderly at risk, including long-term low calcium consumption, medicine interactions that may impair dietary calcium absorption, and the underlining chronic condition osteoporosis, which alters bone development and strength [6, 7]. Sarcopenia is a term used to explain the usage of muscle mass and muscle strength [8]. Sarcopenia is very commonly seen in geriatric population as the muscles lose their ability to perform its function [9]. The target at this phase of the life is to maintain bone mineral density and reduce bone loss because research has revealed that bone density frequently drops significantly after the age of 50. Falling and bone fracture risk are both exacerbated by gradual decrease of bone mineralization over time [10]. Hence proper source of calcium should be provided to maintain proper bone mineral density.

Effect of physical activity in elderly

As the human body ages there are many different physiological and psychological changes occurring in the body which makes difficult for elderly people to carry out their day-to-day activities properly, but many studies show that if there is total stop on any kind of physical activity then it would lead to many diseases. So if small amount of physical activity in form of walking, cycling, or jogging on treadmill for 30 minutes in a day would help old aged people to maintain their balanced body weight and would also help them to come out from their sedentary lifestyle after their retirement. Some of the common problems seen in elderly due to aging are hearing disability, dementia, NCD's, Loss of Bone Mineral Density, Respiratory disorders, Cancer etc. To check the nutritional status of elderly there are many different kinds of tools used such as 'Cumulative Geriatric Assessment Scale (CGA)', 'Mini-Nutritional Assessment Guide (MNA)', 'Clinical frailty Scale (CFS)' etc. One of the most severe expression of increasing age is 'frailty' [11]. A progressive loss of functional ability that can result in dependency, implementation, and death is what is known as frailty [12, 13]. Frailty may be reversible, unlike dependence, and it is well established that therapies based on exercise, dietary modification, or control of polypharmacy are successful [14, 15].

Role of Vitamin-A in Elderly

One foundational element of health is diet. An key risk factor for chronic pathologies like diabetes, cancer, or cardiovascular illnesses is an unhealthy diet. Inadequate diet raises the likelihood of frailty in elderly individuals. More precisely, a deficiency in micronutrients including vitamin D, vitamin C, and omega-3 fatty acids, as well as protein, is linked to this illness [16-18]. The cause of cataract and loss of vision is commonly seen in geriatric population which may be due to deficiency to Vitamin-A or it may be the result of any long-term disease or any side-effect caused due to some severe dose of medication. The major food source of Vitamin-A are from carrots, GLV's, papaya, bell peppers, milk which

old people may consume frequently due to digestive issues as the gut functioning capacity decreases with aging so the supplementation is the possible way to provide the Vitamin source and overcome the deficiency.

Role of protein in elderly

Frailty is the predictor for poor prognosis in elderly that would make them more susceptible to greater risk of unfavourable health-problems. Thus, adequate protein intake in older frail people is the best possible way to maintain and to prevent their muscle mass and physical function capability [19, 20]. The National Academies of Sciences, Engineering, and Medicine (NASEM) have suggested two reference factors that can be used to design and evaluate diets: the Estimated Average Requirement (EAR) and the Recommended Dietary Allowances (RDA). The RDA is regarded to be sufficient to satisfy the nutritional needs of nearly all healthy young adults based on age and gender, whereas EAR stands for the daily intake on average that is adequate to meet the nutrient requirements of 50 percent of the overall of the healthy population. Currently, 0.6 and 0.8 milligrams of grams of protein per kilogram weight (BW) per day are prescribed for ingestion [21]. Older folks ought to take sufficient protein to retain muscle anabolism and minimize adverse health effects. However, it is very problematic for disabled or elderly people to achieve these criteria due to their high prevalence of oral health concerns (such as complications chewing and swallowing [22]). One strategy that might be employed to accommodate these requirements is pulse-feeding, which is contemplated to saturate the smooth muscle sequestration and boost the coverage of AAs for MPS. According to studies, once MPS surpassed a plateau by around 30 g of protein single meal, there was a discernible emergence in whole-body amino-acid oxidation. Symons *et al.* revealed that meals featuring moderate protein amounts (like 30 g) or substantial quantities of protein (sometimes including 90 g) had no more of an effect on MPS. In order to reduce age-related glycogen depletion and strength loss, researchers have posited that a spread feeding pattern with at least 30 g of dietary protein during the main meals (i.e., brunch, lunch, and supper) might be more efficacious than a pulse-feeding strategy [23-26].

Psychosocial complications in Elderly

'Third age' said to be the 'Geriatric age' is the age which come with its own special characteristics that not only affect the physical health and nutritional health but also affects the psychosocial and social life of human being [27]. Despite of the physical changes that have occurred throughout the body as a person ages there are many factors responsible for psychosocial disturbances most common among them are primarily derived isolation due to sadness, wilting due to solitude, long-term illness due to any of the disease suffering from, abandonment from the relatives and from family members, impotence etc. [28]. Some of the most commonly faced psycho-social complications faced by elderly are dementia, depression, loneliness, anxiety, phobia, social exclusion. Most senior people have dementia, which causes short-term memory loss challenges, struggle doing hard day-to-day operations, apathy, irritability, and in more severe cases, apraxia, that further affects speech intelligibility loss, mobility ability loss, and physical irritability [29]. Depression the other disease mostly found in geriatric age; it has 2 factors responsible for its cause firstly elderly people living in the

environment which is very stressful and causes pressure psychologically and the second factor is specifically with biological factor. Regarding the second factor the cause of depression is due to some of the loss of neurotransmitters in brain which causes imbalance in their brain due to some of the diseases that affect the cerebrospinal nervous system or due to some of the medications which results in its side-effect progressing to depression [30]. Anxiety and phobia are the conditions that may result from the previous cause of any chronic disease or may be occurring for the first time. A thorough medical history and extensive physical examination would assist in the treatment of this disorder. The family has the capability to prevent or at least significantly limit the occurrence of psycho-social issues in elderly persons. People can be helped and supported by the emotional connections within families since it indicates to them that they genuinely are a family [31, 32]. Families can take a variety of actions to help elderly people minimize the overall probability of developing psycho-social challenges. The family is wise to integrate aged members in its activities. Moreover, it is feasible for seniors to find interests that bring them joy and happy. Such activities can include creative pursuits, vacations, reunions, fitness training, as well as employment at a private or non-voluntary level. The family can deliver the ideal stimuli to aid the individual adjust to daily existence in the best way possible, so that he may remain independently and active even if he has difficulty picking out how to be social or active [33]. A distressing attitude of isolation from other people, loneliness is usually surrounded by mental fatigue, resentment, or even despair. It is destructive to one's physical and mental health to live alone, whereas being part of a social group could act as a buffer [34]. According to the desire to change to new realities that fair chance in sorrow since the person no longer an active part of society, the stage of retirement together with advancing age can be a long-term main cause of loneliness. Analyzing the past during this usually due the elderly person to focus on frustration, that leads them to feel depressed and alone. However, elderly people experience solitude as a result of having lost loved ones, such as their partner, which renders them social misfits [35].

Conclusion

To conclude proper nutrition plays a very vital role in the maintenance of proper health during old age. If nutritional care is taken during adulthood then it would help in old age to overcome many age-related diseases and would also prevent major deficiencies during that period of life. This article tells about the effect of some kind of physical activity and a properly balanced diet that would help to live a healthy both physical health as well as mental health. Hence in the end it's not that much important how many years a person lived what matters is how that person lived the life.

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