

Determination of Vitamin D, Vitamin B12 and Folic Acid Deficiency Prevalence Among Geriatric Palliative Care Patients

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Abstract

Objective: The more advanced age, the higher incidence and prevalence of chronic diseases. Both vitamin D and B12 deficiency are common health problems affecting geriatric patients. In this study, we aimed at determining the prevalence of vitamin D, B12 and folic acid deficiency among geriatric patients hospitalised in our palliative care clinic.

Materials and Methods: Records of geriatric patients hospitalised between August 2017 and August 2018 were analysed. A total of, 100 patients (53 female and 47 male) were included in the study.

Results: The mean age of the patients was 65.48±6.40 years. Five percent of the patients were diagnosed with vitamin D insufficiency, 86% with vitamin D deficiency; 32% and 62% had vitamin B12 and folic acid deficiency, respectively.

Conclusion: As it is the case throughout the world, vitamin D insufficiency/deficiency is common in Turkey. In our study, the prevalence of vitamin D, B12 and folic acid deficiency was determined to be high among geriatric palliative care patients. It is predicted that well-balanced nutrition along with vitamin D and B12 and folic acid supplementation can improve the quality of life of geriatric palliative care patients and their relatives.

Keywords: Vitamin D, vitamin B12, folic acid, palliative care

Introduction

"Palliativa" in Latin means inclusiveness and protectiveness. Palliative care is a nursing approach that aims at increasing the life quality of patients manifesting life-threatening and incurable diseases (1,2).

Vitamin D is a steroid hormone which has substantial importance to maintain calcium phosphorus balance and accordingly bone health (3,4). As in all age groups, vitamin D deficiency is critical problem for those, aged 65 and above. Vitamin D is substantial for physiological functioning of nervous, cardiovascular, respiratory and immune systems, maintenance of metabolism and healthiness of bones (5,6). Recently, several diseases have been found to be associated with vitamin D deficiency. For

instance, Diabetes Mellitus, cancers and cardiovascular diseases are revealed to be allied with low vitamin D levels. Also, vitamin D deficiency undoubtedly paves the way for decreased muscle strength power, depression, functional disability, increased fall risk and fractures (7).

More or less one billion people throughout the world exhibit low vitamin D levels. Forty to 100% of U.S. and European community dweller elderly population have lower vitamin D levels than normal (8,9). Determination of vitamin D level is recommended in all elders (10).

Vitamin B12 is a water-soluble vitamin. Vitamin B12 deficiency prevalence varies between five and 60% in several studies. It is found to be lower in elders who are living socially active

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(12%) and higher among elders with a kind of health problem or living in a nursing home (30 46-40%) (11). The aetiology vitamin B12 deficiency is compromised by mainly two factors. First one is inadequate intake in nutrition and the latter is reduced absorption through intestine. Vitamin B12 deficiency chiefly leads to cardiovascular diseases, neural tube defects and persistent or progressive pathologies of both central and peripheral nervous system, besides famous haematological disorders. It may cause psychiatric manifestations before hematologic or neurologic symptoms in geriatric age group. While hematologic symptoms regress in response to treatment, neurologic symptoms may remain to be unresolved (12).

Folate is also an important, soluble vitamin in B-complex group which cannot be synthesized in human body. Folate deficiency usually emerges from insufficient intake and prompts certain disorders to develop, such as megaloblastic anemia, major depression, cardiovascular diseases, Alzheimer's disease and increases the risk of some carcinomas. Symptoms, such as headache, weakness, fatigue, irritability, being unable to concentrate, shortness of breath and palpitation can be experienced in case of folate deficiency, as well (13-15). According to "Turkey Nutrition and Health Survey 2010", folate intake is definitively lower than assumed optimal amount among individuals between the age of 15 and 17 and women aged 65 and above in comparison to other age groups (16).

The purpose of this study is to determine the prevalence of vitamin D, B12 and folate deficiencies among geriatric palliative care patients.

Materials and Methods

This is a cross-sectional and retrospective study. The medical file and electronic records of geriatric patients hospitalised for one year, since 1st of August 2017 till 1st of August 2018, were analysed. Totally, 100 patients, 53 of whom were women and 47 were men, included in the study. Diagnoses of the patients were registered. Vitamin D, B12 and folate levels of the patients were reached by using the laboratory results in records. Vitamin D deficiency was defined by serum 25 (OH) D level less than 20 ng/mL (<20 ng/mL) whereas vitamin D insufficiency was referred to the 25 (OH) D level varying between 21 and 29ng/mL (≥21 ng/mL, ≤29 ng/mL) (8). Vitamin B12 levels lower than 200 pg/mL were accepted as vitamin B12 deficiency. Folic acid deficiency was identified when the level was lower than 4.6 ng/MI (17).

Statistics

After conducting questionnaires, the data acquired was recorded into the SPSS 20.0 (Statistical Package for Social Sciences) software and analysed. As all groups formed for analysis provided a pile of continues variables with normal distribution, all descriptive statistics were defined as mean ± standard deviation.

Results

The mean age of the patients was 65.48±6.40. 47% of total were men (47 individuals) and 53% were, women (53 individuals). The lower limits of normal range for vitamin D, B12 and folic acid were verified as 30 ng/mL, 200 pg/mL and 4.6 nmol/L, respectively. While 5% of the patients (5 individuals) were diagnosed with vitamin D insufficiency, 86% (86 individuals) were diagnosed as vitamin D deficient. 32% (32) of the patients exhibited B12 deficiency and 62% (62) folate deficiency. Among all patients in our palliative care patients, 21% had been hospitalized due to malignancy, 16% due to cerebrovascular diseases, and 16% due to decubitus ulcer, 14% due to neurodegenerative diseases (dementia or Parkinson's disease or both), 12% due to Diabetes Mellitus, 12% due to chronic lung diseases and 9% due to heart failure (Table 1).

Discussion

Over the past century, the improvement of living conditions, technology and science as well an increase in the elderly population has continued. Every patient has the right to spend the last days of life in a certain quality and peace of mind. Palliative care is therefore considered among human rights values today. In this study, the levels of vitamin D, Vitamin B12 and folic acid were retrospectively examined in geriatric patients in the palliative care unit of our hospital. Our study is important because it is the first study to investigate the levels of vitamin D, Vitamin B12 and folic acid in geriatric patients in palliative care in our country. As a result of our study; 5% of the patients were diagnosed with vitamin D insufficiency; 86% were diagnosed as vitamin D deficiency. 32% and 62% exhibited vitamin B12 and folic acid deficiencies, respectively.

Table 1. Features of the geriatric palliative care patients	
Total of patients, n	100
Age, mean (SD)	65.48 (6.40)
Women/men, %	53/47
Diagnosis, %	21
Malignancy	16
Decubitus ulcer	16
Cerebrovascular diseases	14
Dementia	12
Diabetes Mellitus type II	12
Chronic obstructive lung disease	9
Heart failure	
Vitamin D level, mean (SD)	12.64±11.12
Vitamin D insufficiency prevalence %	5
Vitamin D deficiency prevalence %	86
Vitamin B12 level, mean (SD)	346.148±224.934
Vitamin B12 deficiency prevalence	32%
Folic acid level, mean (SD)	5.57±3.51
Vitamin folic acid deficiency prevalence %	62
SD: Standard deviation, n: Number of the patients	

Vitamin D insufficiency/deficiency is common both in Turkey and throughout the world. Relationship between vitamin D levels and fractures is extraordinarily an object of curiosity (18). On the other hand, some brand-new roles have been provided for vitamin D. For instance, Vitamin D is also proposed to restore mitochondrial dysfunction and alleviate oxidative stress and inflammation. Thus, even a hypothesis based upon vitamin D deficiency/insufficiency and ageing coupling is brought forward (19). There also seems to be an inverse correlation between 25 (OH) D level and both type I and II Diabetes Mellitus (20). Some observational studies indicate that vitamin D insufficiency/deficiency may contribute to pathological basis of cardiovascular risk factors such as hypertension, hyperlipidaemias and obesity and certain diseases such as ischemic heart diseases and stroke (21). With all these diseases, chronic pain patients can also admit to clinics as having a low in vitamin D alone (22).

A recent study in England uncovers that 50% of adult population have vitamin D insufficiency whilst 16% purely have vitamin D deficiency (23). Among women aged 80 or above, vitamin D insufficiency/deficiency is found to be presented with a high prevalence, up to 80% as much. Even among healthy adolescents the prevalence is to found to be approaching as a high value as 42% (24). There are only a few studies displaying vitamin D status of elderly individuals in Turkey. In one of them, 33.4% of elderly individuals are detected to be vitamin D deficient (25). We also reached a high prevalence of vitamin D deficiency among both adult and elderly Turkish population in the south-eastern part of Turkey, as high as 75% (<20 ng/mL), in one of our previous studies. (26). In our study, 5% of geriatric palliative care patients displayed insufficiency and 86% were strictly vitamin D deficient. In our study, it was concluded that the reason for the relatively high incidence of vitamin D deficiency in palliative care patients was due to high malnutrition, immobility, and inability to benefit from the sun in palliative care patients.

Increased oxidative stress, risk of fracture, chronic pain, Diabetes Mellitus and cardiovascular disease prevalence are associated with vitamin D deficiency in palliative care, so screening of vitamin D levels in geriatric patients and supplementation if it is below acceptable range would have a very plausibly low cost if we consider benefits of patients exhibiting before mentioned diseases.

The metabolisms of folic acid and vitamin B12 intersect during the transfer of the methyl group from five-methyltetrahydrofolate to homocysteine catalyzed by B12-dependent methionine synthase. Vitamin B12 and folic deficiencies mostly arise from malabsorption. Vitamin B12 and folic deficiencies are commonly seen in elders because of both dietary inadequacy and high incidence of atrophic gastritis (27-29).

Folate and/or vitamin B12 deficiency may have additive effects in many diseases including, anemia, weakness and confusion, memory deficits, shortness of breath, peripheral neuropathy, pregnancy complications, depression, cardiovascular diseases, stroke, myelopathy, sensory and motor disturbances, ataxia, cognitive decline leading to dementia, malignancies, and psychiatric disorders (17,28).

There are only a few studies displaying, vitamin B12 and folate status of elderly individuals in Turkey. Yıldırım and colleagues revealed that 62.2% of elders aged between 60 and 74, 72.2% of elders aged between 75 and 84 and 50% of elders aged 85 and above are diagnosed as B12 deficient. Also, they declared that 10.4% of elders aged between 60 and 74, 12.2% of elders aged between 75 and 84 and 20% of elders aged 85 and above are diagnosed with folate deficiency (30). In our study, 32% and 62% exhibited vitamin B12 and folic acid deficiencies, respectively. In our study, it was concluded that the reason for the relatively high incidence of vitamin B12 and folic acid in palliative care patients was due to high malnutrition.

Several limitations of the current study need to be discussed. The main limitations of our study are as follows: the retrospective character of the study was one of leading limiting aspect. It should be supported by prospective studies. Also, our study consisted of data obtained from a single center. Moreover, for folic acid, vitamin B12 and vitamin D, only the first laboratory values of the patient's hospital intake assessment were considered. Detailed evaluation of folic acid, vitamin B12 and vitamin D status of geriatric patients in palliative care hospitalization is important and the results of prospective studies may be guiding.

Conclusion

We found that vitamin D, folic acid and vitamin B12 deficiencies were high in elderly patients hospitalized in palliative care. In consideration of increased risk and frequency of fracture, psychiatric disease, dementia, falls, cardiovascular diseases, stroke, anemia, chronic fatigue, malignancy in elderly patients in palliative care; screening and reducing vitamin D, folic acid and vitamin B12 deficiencies will be a step that does not require much cost but has a high return on the quality of life of patients in palliative care.

Ethics

Ethics Committee Approval: Approval was obtained from Gaziantep University Local Ethics Committee (01.08.2018/2018/203).

Informed Consent: Informed consent was not taken.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Concept: İ.H.T., Design: Z.A.Ö., Data Collection or Processing: E.M.E., Analysis or Interpretation: İ.H.T., Literature Search: M.G., Writing: M.S.T.

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