FREQUENCY OF VITAMIN B12 DEFICIENCY IN ELDERLY PATIENTS PRESENTED WITH DEMENTIA

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ABSTRACT

Background: Dementia, also known as senility, is a broad category of brain diseases that cause a long term and often gradual decrease in the ability to think and remember that is great enough to affect a person's daily functioning. Patients with Dementia can have difficulties with cognitive functions such as memory, language, reasoning, planning, recognizing, or identifying people or objects.

Objective: To determine the frequency of vitamin B12 deficiency in elderly patients presented with dementia

Methods: This descriptive cross-sectional study was conducted at the department of Medicine Hayatabad Medical complex, Peshawar fro January 2016 to June 2016. In this study a total of 145 patients were studied. All the patients were subjected to detailed history and clinical examination. The diagnosis of dementia was based on the clinical examinations of patient and brain imaging. From all included patients, 5 cc blood was collected under strict aseptic techniques and was sent to laboratory on the same day for serum vitamin B12 levels. All the tests were done under the supervision of senior pathologist who was had extensive experience in his field. All the above mentioned information including name, age, gender and address were recorded in the study proforma

Results: Our study shows that mean age was 80 years with SD ± 3.542. Fifty five percent patients were male while 45% patients were female. Forty two percent patients had vitamin B12 deficiency.

Conclusion: Our study concludes that the frequency of vitamin B12 deficiency was found to be 42% in elderly patients presented with dementia

Key Words: Vitamin B12 deficiency, elderly, dementia.

INTRODUCTION

Dementia, also known as senility,[1] is a broad category of brain diseases that cause a long term and often gradual decrease in the ability to think and remember that is great enough to affect a person's daily functioning. Common symptoms include emotional problems, problems with language, and a decrease in motivation while a person's consciousness is not affected.[2] Patients with Dementia can have difficulties with cognitive functions such as memory, language, reasoning, planning, recognizing, or identifying people or objects. The probability of suffering from dementia increases with age. Dementia mostly occurs in the second half of life, often after the age of 65.3 Dementia is an umbrella term used to describe over 100 conditions, of which Alzheimer's disease (AD) is the most common. Alzheimer's Disease International estimated that there were over 35 million people with dementia worldwide in 2010.4 Alzheimer's disease accounts for about 50-70% of all dementia cases, and vascular dementia accounts for between 15-20%.5According to 2011 Alzheimer's disease facts and figures, Alzheimer's Disease effects between 60% and 80% of those with dementia5.

Deficiencies of the vitamins, particularly B12, are associated with neurological and psychological dysfunction and with congenital defects. In the elderly, cognitive impairment and incident dementia is related to the high prevalence of inadequate B vitamin status and to elevations of plasma homocysteine 6. Vitamin B12 deficiency has long been documented in hematological disorders and can be associated with neurological impairments and mental changes including dementia. The role of vitamin B12 deficiency as a cause of dementia, however, is still unclear. Some studies have found that serum cobalamin levels were normal in patients affected by Alzheimer's disease (AD), whereas others have evidenced a vitamin B12 deficiency.7Vitamin B12 deficiency, which is often overlooked in clinical practice, is a common cause of neuropsychiatric symptoms in elderly patients. It is estimated that up to 40% of older adults have vitamin B12 deficiencies, where lower rates are seen in the community and higher rates in institutional settings. Prevalence rates vary according to economic status, age, and dietary choices.8Prevalence of vitamin B12 deficiency is as high as 49% in India due to widespread vegetarianism and in China, 19.7% of over-60-year olds are deficient.4It has also been suggested that low vitamin B12 levels may cause a reversible dementia that can be differentiated from Alzheimer's

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disease through neuropsychological evaluation, but other authors argue that there is insufficient evidence to support a specific profile of cognitive impairment associated with vitamin B12 deficiency and that dementia of the Alzheimer type is a compatible diagnosis. In patients with Alzheimer's disease, low vitamin B12 level has been associated with greater cognitive impairment.8

Vitamin B12 deficiency is reported as a common cause associated with dementia in older persons. Malabsorption accounts for the majority of cases. Vitamin B12 deficiency has been associated with neurologic, cognitive, psychotic, and mood symptoms, as well as treatment-resistance. Clinician awareness should be raised to accurately diagnose and treat early deficiencies to prevent irreversible structural brain damage, because current practice can be ineffective at identifying cases leading to neuropsychiatric sequelae. In this regard the current study is designed to determine the frequency of vitamin B12 deficiency in elderly patients presented with dementia. One major reason behind this study is that no study has been conducted on this issue at our locality before. The implication of this research will highlight the issue for the practicing clinicians and will improve the management of this important public health problem in our community. The results will be projected to various health care institutions to improve the diagnoses and for better management of such elderly patients.

MATERIALS AND METHODS

This descriptive cross sectional study was conducted at the department of Medicine, Hayatabad Medical Complex, Peshawar from 21/1/2016 to 21/6/2016.

The otal sample size was 145, using 40% prevalence of vitamin B12 deficiency, 95% confidence level and 8% margin of error. Sampling technique was non probability consecutive sampling.

Patients of both gender with age 60 to 90 years with dementia were included in the study. Patients with history of alcohol abuse, multi-infarct dementia and parkinsonism were excluded from the study.

This study was conducted after approval from hospital ethical and research committee. All patients fulfilling the inclusion criteria were recruited through outpatients department. The purpose and benefits of study was explained to the patients and an informed consent was obtained. All patients were subjected to detailed history and clinical examination. Diagnosis of dementia was based on the clinical and radiological examinations of patient's brain.

From all included patients, 5 cc blood was collected under strict aseptic techniques and was sent to laboratory on the same day for serum vitamin B12 levels. All the tests were done under the supervision of senior pathologist who was had extensive experience in his field.

All the above mentioned information including name, age, gender and address were recorded in the study Proforma (APPENDIX-I). Strict exclusion criteria had followed to control confounders and bias in study results.

Data collected was analyzed in SPSS version 17. Mean ± SD were calculated for continuous variable like age and dementia, and categorical variable like gender and serum vitamin B12 level. The later was expressed as frequencies and percentages. Serum vitamin B12 level was stratified among both sexes and dementia to see the effect modification. Results will be presented as tables and graphs. Post stratification chi-square test was applied by taking $P \leq 0.05$ as significant.

RESULTS

This study was conducted in Department of Medicine, Hayatabad Medical Complex, Peshawar in which 145 patients were observed frequency of vitamin B12 deficiency in elderly patients presented with dementia and the results were analyzed as.

Age distribution among 145 patients was analyzed as 33(23%) patients were in age range 60-70 years, 58(40%) patients were in age range 71-80 years 54(37%) patients were in age range 81-90 years. Mean age was 80 years with SD ± 3.542. (table no 1)

Gender distribution among 145 patients was analyzed as 80(55%) patients were male while 65(45%) patients were female. (table no 2)

Serum vitamin B12 level among 145 patients was analyzed as 61(42%) patients had serum vitamin B12 level range 100-150 mol/l while 84(58%) patients had serum vitamin B12 level range >150 mol/l. Mean serum vitamin B12 level was 165 with SD ± 4.771 (table no 3)

Vitamin B12 deficiency among 145 patients was analyzed as 61(42%) patients had vitamin B12 deficiency while 84(58%) patients didn't had vitamin B12 deficiency. (table no 4)

Stratification of Vitamin B12 deficiency with age and gender is given in table no 5,6

DISCUSSION

Dementia, also known as senility [9, 10], is a broad category of brain diseases that cause a long term and often gradual decrease in the ability to think and remember that is great enough to affect a person's daily functioning. Common symptoms include emotional problems, problems with language, and a decrease in motivation while a person's consciousness is not affected [11]. Patients with Dementia can have difficulties with cognitive functions such as memory, language, reasoning, planning, recognizing, or identifying people or objects. The probability of suffering from dementia increases with age. Dementia mostly occurs in the second half of life, often after the age of 65[12]. Dementia is

Table No 1: Age Distribution (n=145)

Age	Frequency	Percentage
60 70 years	33	23%
71-80 years	58	40%
81-90 years	54	37%
Total	145	100%

Mean age was 80 years with SD ± 3.542

Table No 2: Gender Distribution (n=145)

Gender	Frequency	Percentage
Male	80	55%
Female	65	45%
Total	145	100%

Table No 3: Serum Vitamin B12 Level (n=145)

Serum vitamin b12 level	Frequency	Percentage
100-150 mol/l	61	42%
>150 mol/l	84	58%
Total	145	100%

Mean serum vitamin B12 level was 165 with SD ± 4.771

Table No 4: Vitamin B12 Deficiency (n=145)

Vitamin b12 deficiency	Frequency	Percentage
Yes	61	42%
No	84	58%
Total	145	100%

Table No 5: Stratification Of Vitamin B12 Deficiency W.R.T Age Distribution (n=145)

Vitamin B12 Deficiency	60-70 years	71-80 years	81-90 years	Total
Yes	13	24	24	61
No	20	34	30	84
Total	33	58	54	145

Chi square test was applied in which P value was 0.8899

Table No 6: Stratification Of Vitamin B12 Deficiency W.R.T Gender Distribution (n=145)

Vitamin B12 Deficiency	Male	Female	Total
Yes	34	27	61
No	46	38	84
Total	80	65	145

Chi square test was applied in which P value was 0.9071

an umbrella term used to describe over 100 conditions, of which Alzheimer's disease (AD) is the most common. Alzheimer's Disease International estimated that there were over 35 million people with dementia worldwide in 2010. Alzheimer's disease accounts for about 50-70% of all dementia cases, and vascular dementia accounts for between 15-20%. According to 2011 Alzheimer's disease facts and figures, Alzheimer's Disease effects between 60% and 80% of those with dementia13.

Our study shows that mean age was 80 years with SD ± 3.542. Fifty five percent patients were male while 45% patients were female. Forty two percent patients had vitamin B12 deficiency. Similar results were observed in another study conducted by Lachner C 14 et al in which vitamin B12 deficiency, which is often overlooked in clinical practice, is a common cause of neuropsychiatric symptoms in elderly patients. It is estimated that up to 40% of older adults have vitamin B12 deficiencies, where lower rates are seen in the community and higher rates in institutional settings. Prevalence rates vary according to economic status, age, and dietary choices15,16.

Similar results were observed in another study conducted by Karnaze DS et al 17 in which the prevalence of vitamin B12 deficiency is as high as 49% in India due to widespread vegetarianism and in China, 19.7% of over-60-year olds are deficient18, It has also been suggested that low vitamin B12 levels may cause a reversible dementia that can be differentiated from Alzheimer's disease through neuropsychological evaluation, but other authors argue that there is insufficient evidence to support a specific profile of cognitive impairment associated with vitamin B12 deficiency and that dementia of the Alzheimer type is a compatible diagnosis. In patients with Alzheimer's disease, low vitamin B12 level has been associated with greater cognitive impairment.

Similar results were observed in another study conducted by Cole MG et al 19 in which the incidence of low vitamin B12 levels among dementia patients has been found to range between 29% and 47%.

Similar results were observed in another study conducted by Martin DC et al 20 in which the incidence of low vitamin B12 levels among dementia patients has been found to be 44%.

CONCLUSION

In our study we found that deficiency of vitamin B12 deficiency is prevalent in elderly patients with dementia in high amount.

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