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STUDY OF NEUROLOGICAL MANIFESTATIONS OF DEFICIENCY OF VITAMIN B12

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Abstract

Introduction- *Vitamin B12 deficiency is commonly observed parameter in developing countries of world. It may lead to Asymptomatic stage to wide spectrum of neuropsychiatric symptoms.* ***Aim-*** *This study is done to study the prevalence of various neurological complications of B12 deficiency in various age groups and relative percentage of each complication.* ***Method-*** *50 patients between age of 18 and 80 were analysed. Patients clinical and neurological symptoms were assessed and their diagnosis was confirmed by low serum vitamin B12.* ***Conclusion-*** *The most common neurological symptom was parasthesia in 44% of patients whereas impaired joint position with vibration sensation in 50% of cases was most common sign.*

Keywords: *Vitamin B_{12}, parasthesia, joint sensation.*

INTRODUCTION

Vitamin B_{12} is one of the most important vitamin for human body. It is important in reactions to DNA and cell metabolism and its deficiency may lead to several clinical consequences[1]. Deficiency can cause ineffective erythropoiesis and megalobalstic anemia, neurologic dysfunction, psychiatric manifestation, glossitis. Vitamin B_{12} deficiency may take decades to develop and patients may be asymptomatic or may present with a wide spectrum of neuropsychiatric manifestation[2] . neurological manifestations of vitamin B_{12} comprises of:

A) CNS manifestations: Dementia
- Depression
- Psychosis
- Cerebrovascular disease
- Spinal cord manifestation includes myelopathy, ataxia, spasticity, abnormal gait.

B) PNS manifestations:
- Polyneuropathy
- Mononeuropathy
- Autonomic neuropathy
- Myeloneuropathy

We herein decided to study these manifestations in different age groups.

MATERIALS AND METHODS

Our study is tertiary hospital based done during period of 1 year from may 2018- may 2019. Patients were recruited from VSGH hospital on both outdoor and indoor basis. Inclusion criteria for study were patient with vitamin B_{12} level <200 pg/ml and having following neurological symptoms tingling numbness over hands and legs, psychiatric or cognitive symptoms, gait abnormalities, visual symptoms, constitutional symptoms including anorexia and weight loss, autonomic features including orthostasis, sexual dysfunction and bowel & bladder incontinence, paraparesis, dementia guided by MMSE examination. Neurological signs included are ataxia and gait imbalance, impaired joint positon and vibration sense, motor weakness, abnormal tone, abnormal reflexes, impaired visual acuity. Severly morbid, post operative and patient who didn't gave consent were excluded from study. 50 patient were enrolled in study out of which 20 were female and 30 were male.

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Patient undergone CBC, serum B_{12} levels, MMSE and clinical examination. At the end of study appropriate analysis was done and results were tabulated.

RESULTS

Neurological symptoms and signs with vitamin B_{12} deficiency were most common in 6th decade of life (40%). It is also evident that the middle and elderly group were at higher risk of developing megaloblastic anemia.

AGE GROUP	NO. OF CASES	PERCENTAGE
18-29	3	6%
30-39	9	18%
40-49	15	30%
50-59	20	40%
60-69	3	6%
70-79	0	0%

After separating the prevalence of megaloblastic anemia in male and female, a little higher prevalence was seen in male as compared to female.

SEX	ALCOHOLIC	PERCENTAGE
MALE	8	16%
FEMALE	0	0%
TOTAL	8	16%

Higher prevalence of vitamin B_{12} in males is found due to higher incidence of alcoholism in male in compared to female.

NEUROLOGICAL SYMPTOMS	NO. OF CASES	PERCENTAGE
Parasthesia	24	48%
Abnormal gait/ataxia	8	16%
Visual impairment	4	8%
Motor weakness/ paraplegia	6	12%
Neuropsychiatry symptoms	2	4%
Dementia	3	6%
Constitutional symptoms	9	18%
Autonomic symptoms	2	4%

As noted in above table, most common neurological symptom is parasthesia followed by ataxia and gait imbalance, least common symptom are neuropsychiatric and autonomic symptoms.

NEUROLOGICAL SIGNS	NO. OF CASES	PERCENTAGE
Impaired JPV sensation	25	50%
Abnormal fundus examination	4	8%
MRI demyelinating lesions	6	12%
Abnormal NCV examination	22	44%
Abnormal MMSE examination	3	6%
Abnormal tone	7	14%

As noted above the most common neurological sign is impaired joint position and vibration sensation in 50% of cases.

DISCUSSION

In our study vitamin B_{12} deficiency and its neurological manifestations were studied . This study is compared to 2 other studies done Healton et al[3] and misra UK, Kalita J, Das A[4]. In 1991, Healton et al performed detailed neurologic

evaluation of 143 patients with vitamin B_{12} deficiency, 74% presented with neurologic symptoms [3]. Most common symptoms found was isolated numbness in 33%. It was comparable to our study. Most common sign was combination of neuropathy and myelopathy found in 41%.

Comparison table between our trial and other 2 trials by Healton et al and Misra UK, Kalita J, Das A.

NEUROLOGICAL PARAMETER	HEALTON ET AL	MISRA UK, KALITA J, DAS A	OUR STUDY
Parasthesia	33%	44%	48%
Ataxia	12%	10%	16%
Neuropsychiatric symptoms	8%	2%	4%
Myeloneuropathy	41%	44%	50%
Myelopathy	12%	25%	12%
Neuropathy	25%	56%	44%

CONCLUSION

Vitamin B_{12} deficiency is more common in middle and elderly group . 50 patients involved in the study if which 30 were males and 20 were females and the most common age group was 50-59 years of age. Most common neurological symptom was parasthesia in 44% and most common sign was impaired joint sensation in 50%. A comparison was made with two international studies and results were compared. Vitamin B_{12} deficiency detection and timely correction can minimize many morbidities and lead to healthy life.

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