A STUDY OF THE RELATION BETWEEN VITAMIN D AND PERIPHERAL NEUROPATHY IN EGYPTIAN MULTIPLE MYELOMA PATIENTS

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Introduction

Multiple myeloma (MM) is the second most frequent hematological malignancy and comprises about 1% of all cancers, and 10% of hematological malignancies.
Some of the agents used for treatment of MM may lead to peripheral neuropathy (PN) such as, thalidomide, bortezomib, and less commonly lenalidomide and carfilzomib.
PN is usually sensory neuropathy that may be accompanied by motor and autonomic neuropathy.
Vitamin D is known to decrease the possible damage to the peripheral nervous system.
Vitamin D has many essential functions in brain, including maintaining calcium balance and signaling, neurotrophic factors regulation, neuroprotection, neurotransmission modulation, and contributing to synaptic plasticity.
Vitamin D has important role in neuronal differentiation, maturation, through alterations in several neurotrophic factors, with increased synthesis of nerve growth factor (NGF), glial cell line–derived neurotrophic factor (GDNF), and neurotrophin 3 (NT-3), and with decreased synthesis of NT-4.
Serum levels of vitamin D have been inversely linked with painful symptoms and increased sensitivity to pain.

Aim of the work

The aim of the present work is to study the relationship between vitamin D status and peripheral neuropathy in Egyptian MM patients previously treated for at least 12 weeks by proteasome inhibitors, immunomodulatory drugs, or both.

Patients and Methods

PATIENTS : Sixty MM patients diagnosed according to the IMWG criteria for the diagnosis of MM and received proteasome inhibitors and/or immunomodulatory drugs for at least 12 weeks.
METHODS: Patients were subjected to thorough history taking, clinical examination and assessment of PN grade if present with The NCI Common Toxicity Criteria for Adverse Events (CTCAE) for peripheral neuropathy.
Patient also subjected to routine plus specific investigations for MM .
Specific laboratory test: Serum vitamin D was done for all patients and 60 age and sex matched control group for vitamin D.

Results

Table 1: Comparison between the two studied groups according to Vit.D level and state

Vit.D	Cases (n = 60)	Control (n = 60)	p
Vit.D level			
Min. – Max.	6.0 – 44.10	2.0 – 47.0	0.992
Median (IQR)	12.70 (9.37 – 20.52)	15.0 (7.85 – 22.85)	
Vit.D State			
Deficient	18 (30.0%)	19 (31.7%)	0.734
Insufficient	27 (45.0%)	23 (38.3%)	
Sufficient	15 (25.0%)	18 (30.0%)	

Table 2: Relation between PN grade and Vit.D in cases group (n = 60)

	PN grade				p
Vit.D	Negative (n = 14)	Grade I (n = 17)	Grade II (n = 19)	Grade III (n = 10)	
Min. – Max.	9.47 – 44.10	6.0 – 27.0	6.09 – 34.40	6.60 – 18.50	<0.001*
Median	23.72	10.75	12.30	10.17	
Vit.D State					
Deficient	2(14.3%)	4 (23.5%)	7 (36.8%)	5 (50.0%)	^{MC}p <0.001*
Insufficient	1 (7.1%)	10 (58.8%)	11 (57.9%)	5 (50.0%)	
Sufficient	11 (78.6%)	3 (17.6%)	1 (5.3%)	0 (0.0%)	

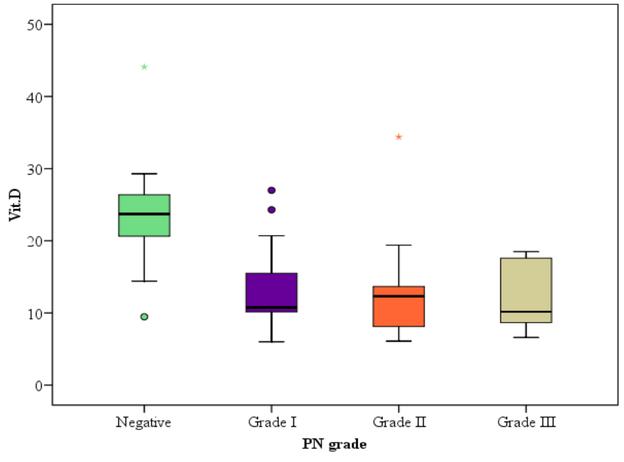

Figure : Relation between PN grade and Vit.D in cases group (n = 60)

Conclusion

- The prevalence of vitamin D deficiency is equal in both MM and control groups.
- There is a significant correlation between vitamin D level and state, and PN grade in MM patients.
- Those patients with lower vitamin D level are associated with high incidence and more severe PN.