The Association of Vitamin D With Peripheral Neuropathy Among Prediabetic Individuals and The Effect of Vitamin D Supplementation

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ABSTRACT

BACKGROUND:

Vitamin D deficiency seems to be more prevalent among diabetic patients with distal symmetrical polyneuropathy. Besides, those patients have a lower pain threshold; there is a shortage of data concerning pre-diabetic individuals with peripheral neuropathy (PN).

AIM:

First, to study the association of vitamin D deficiency with PN severity. Second, to determine the effect of vitamin D supplementation on PN in pre-diabetics.

METHODS:

178 pre-diabetic individuals aged18-60 years were recruited from outpatient department of the National Institute of Diabetes and Endocrinology, Cairo, Egypt; 89 patients with and 89 patients without PN (group A and group B, respectively). All patients werescreened for PN using 10g monofilament, tuning fork, ankle reflex and pinprick test. In the first visit, baselineneuropathic total pain score and severity were assessed for group A, by Douleur Neuropathic 4 diagnostic questionnaire (DN4) and Short-form McGill Pain Questionnaire (SF-MPQ), respectively. In addition, serum 25- hydroxyvitamin D, ionized calcium, phosphorus, PTH, HbA1c, fasting blood glucose (FBG), 2hrs post 75g glucose (2hr PPBG), creatinine, thyroid function test and lipid profile were measured for both groups. Prediabetic patients with PN were given vitamin D3 200.000IU IM monthly for 3 months. They were assessed clinically in 3 subsequent visits, one month apart. In the last visit all the laboratory measures, DN4 and (SF-MPQ) were repeated.

RESULTS:

None of the patients in both groups had sufficient vitamin D status. Vitamin D deficiency was highly prevalent among both groups, where 79.8% and 89.9% were deficient;20.2% and 10.1% were insufficient among group A and group B respectively, p value 0.001. Nonetheless, there was insignificant difference in vitamin D levels between group A and group B (14 ±6.4 and 14.6±4, p =0.4). Vitamin D level was not correlated with peripheral neuropathic total pain score and severity (r = -0.052, -0.032 respectively, p >0.05) among group A. Supplementation of vitamin D resulted in a highly significant improvement in FBG, 2hr PPBG, HbA1c and lipid profile, p< 0.001. Interestingly, total pain scoreand severity before vitamin D supplementation was (6.4±1.6 and 28.3±7.2, respectively) and after was (2.5±0.9 and 17±6.3, respectively, p<0.001).

CONCLUSION:

Vitamin D deficiency is prevalent among prediabetics. Correction of vitamin D deficiency improves glycemic parameters and severity of peripheral neuropathy

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