Original Article

25 hydroxy vitamin D3 levels in type 2 diabetic patients

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Abstract

Background: It has been demonstrated that vitamin D deficiency is associated with hypertension, and type 2 diabetes mellitus (T2DM). We investigate the association of 25-hydroxyvitamin D3 levels with type 2 diabetic patients. A total of 120 T2DM patients, aged between 45 and 83 years, were recruited from the outpatient clinic at DPU Evliya çelebi Education and Research Hospital from Marc 2014 to June 2014. Ninety healthy age-matched individuals constituted the control group. Body mass index (BMI) was calculated as the weight in kilograms divided by the square of the height in meters (kg/m2). All patients were free of diseases or medications that might interfere with their vitamin D status. This study included 120 patients with T2DM,68 females (56%) and 52 males (43%).In T2DM patients BMI(28.9±3.9), HbA1c(8.3±1.9) were significantly higher (p=<0.01) and 25(OH)D levels(9.8±8.4) were significantly lower than in controls (p=<0.01). When we made correlation analysis in diabetic patients, we found that 25OHD negatively correlated with BMI (p=<0.001, r=-0.23), HbA1c (p=<0.05, r=-0.21). We found that vitamin D levels were significantly low in type 2 diabetics compared to non-diabetics. There was an inverse relationship between vitamin D levels and insulin resistance.Our non-diabetic population also had low 25(OH)D levels,we recommend vitamin D supplementation in our population.

Key Words: type 2 diabetes mellitus, vitamin D deficiency, Body mass index.

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Introduction

It has been demonstrated that vitamin D deficiency is associated with hypertension (1-2), and type 2 diabetes mellitus (T2DM) (3-4), It has been demonstrated that vitamin D deficiency is associated with type 2 diabetes mellitus (T2DM). Serum concentration of 25-hydroxy vitamin D3(25(OH)D) is the best indicator of vitamin D status (5). Hypovitaminosis D is defined as serum 25(OH)D concentration <20ng/ml (6,7). It has been reported that insulin secretion is dependent upon vitamin D.(9) It has also been reported that there is a positive correlation of vitamin D concentration with insulin sensitivity.(10)We investigate the association of 25-hydroxyvitamin D3 levels with type 2 diabetic patients.

Material and Methods

A total of 120 T2DM patients, aged between 45 and 83 years, were recruited from the outpatient clinic at DPU Evliya çelebi Education and Research Hospital from Marc 2014 to June 2014. Ninety healthy age-matched individuals constituted the control group. Subjects with a history of liver disease and chronic renal disease, malabsorption, skin disorders, celiac

disease, inflammatory bowel disease and taking medications that may interfere with serum levels of 25(OH)D were excluded. After detailed physical examination, body weight and height were measured in all patients. Body mass index (BMI) was calculated as the weight in kilograms divided by the square of the height in meters (kg/m2). Calculations were performed using SPSS version 10.1. Student's t-test was used to compare the groups in a parametric way and the Mann-Whitney U test was used in a non-parametric way. Correlation between variables was calculated using Pearson's correlation coefficient. Data are presented as mean±SD. A p value of less than 0.05 was considered statistically significant.

Results

This study included 120 patients with T2DM,68 females (56%) and 52 males (43%).

In T2DM patients BMI(28.9±3.9), HbA1c(8.3±1.9) were significantly higher (p=<0.01) and 25(OH)D levels(9.8±8.4) were significantly lower than in controls (p=<0.01). When we made correlation analysis in diabetic patients, we found that 25OHD negatively correlated with BMI (p=<0.001, r=-0.23), HbA1c (p=<0.05, r=-0.21). Then we classified our diabetic patients according to their 25 (OH) D levels as follows: 1) <12, 2) 12-20 and 3) >20ng/ml. We did not find any difference in serum 25 (OH) D levels between the patient subgroups.

Discussion

Case-control studies, patients with T2DM are found to have lower serum 25(OH)D concentration compared with controls without diabetes. We also found lower levels of 25(OH)D in our diabetic patients, compared to that in controls. Patients with diabetes are at risk for vitamin D insufficiency and deficiency. Reasons for this include diet, lack of sun exposure, obesity, lack of outdoor physical activity, renal impairment. 25(OH)D levels in the range of 30 to 60 ng/mL are considered normal (8). Vitamin D insufficiency has been defined as a 25(OH)D of 16-30 ng/mL (11). Vitamin D deficiency is generally defined as a 25(OH)D below 20 ng/mL(6,7). We found that vitamin D levels were significantly low in type 2 diabetics compared to non-diabetics.There was an inverse relationship between vitamin D levels and insulin resistance.Our non-diabetic population also had low 25(OH)D levels,we recommend vitamin D supplementation in our population.

Table 1. Demographic and laboratory findings of the groups

	T2DM n=120	**Control n=60**	p
Age (year)	55.8±9.5	53.9±7.9	ns
BMI (kg/m2)	28.9±3.9	26.9±3.02	<0.01
HbA1c (%)	8.3±1.9	5.3±0.6	<0.01
25(OH)D (ng/ml)	9.8±8.4	15.1±5.2	<0.01

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