

THE EFFECTS OF D VITAMIN TREATMENT ON INSULIN RESISTANCE AND OTHER METABOLIC PARAMETERS IN PATIENTS WITH CHRONIC KIDNEY DISEASE



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Objectives:

The relationship between vitamin D deficiency and insulin resistance has been reported in several studies. The aim was to investigate the effect of Dvit treatment on insulin resistance and other metabolic parameters in chronic kidney disease (CKD) patients with vitamin D deficiency/insufficiency

Methods:

A total of 138 CKD patients with a 25(OH)D level below 30 and without diabetes mellitus were included in the study. Socio-demographic characteristics (sex, age, primary kidney disease, body mass index, smoking) were recorded. Biochemical assays [fasting blood glucose (FBG), urea, creatinine, calcium, phosphate, parathyroid hormone (PTH), total cholesterol, HDL and LDL cholesterol, triglyceride, HbA1c) and insulin resistance (HOMA-IR) were examined. After 8 weeks Dvit treatment was given to the patient, the laboratory tests were repeated and the results were recorded. The effect of Dvit replacement on insulin resistance and other metabolic parameters was assessed.

Results:

138 CKD (57 females, 81 males) were included. A total of 57 patients were excluded from the study: 6 of whom had an FBG \geq 126 or HbA1c \geq 6.5 and 51 patients who did not use Dvit treatment in sufficient dose or duration, or who did not come to control. A total of 81 patients (35 female, 46 male, mean age 52.36 \pm 16.17 years) were evaluated. The demographic data of the patients are presented in table 1.

25(OH)D level increased from 13.36 \pm 6.67 to 48.74 \pm 14.59 with dvit treatment (p = 0.000). Increased phosphorus and HDL cholesterol, decreased PTH and LDL cholesterol were detected after Dvit treatment. Insulin resistance and other parameters did not change (table 2).

There was a positive correlation between 25(OH)D level and calcium, a negative correlation with GFR and PTH. And also, positive correlation between HOMA-IR and FBG, insulin, triglyceride, negative correlation GFR and LDL cholesterol was found (table 3).

Table 1: Demographic features of the patients

		Patients (n=81)
Age (years)		52.36 \pm 16.17
Gender (F/M)		35/46
Primary disease	Hipertension	16
	Glomerulonephritis	13.6
	Solitary kidney	16
	Polycystic kidney disease	9.9
	Other	17.3
	Unknown	27.2
Body mass index		28.18 \pm 5.72
Body mass index (%)	Weak (<18.5)	1.2
	Normal (18.5-24.9)	25.9
	Overweight (25-29.9)	37
	Obese-1 (30-34.9)	34.6
	Obese-2 (>35)	1.2

Table 2: The effect of Dvit replacement on insulin resistance and other metabolic parameters

	Initial	After treatment	p
25(OH)D (ng/ml)	13.36 \pm 6.67	48.74 \pm 14.59	0.000
HOMA-IR	3.42 \pm 2.25	3.73 \pm 2.53	0.155
FBG (mg/dl)	98.53 \pm 9.33	99.44 \pm 10.20	0.393
Insulin (mIU/l)	14.13 \pm 8.33	15.40 \pm 9.73	0.118
Urea (mg/dl)	63.31 \pm 39.89	61.23 \pm 37.84	0.258
Creatinine (mg/dl)	1.81 \pm 1.13	1.79 \pm 1.17	0.682
eGFR (mL/min/1.73 m ²)	55.64 \pm 36.39	56.35 \pm 35.99	0.570
Calcium (mg/dl)	9.44 \pm 0.49	9.35 \pm 0.62	0.235
Phosphate (mg/dl)	3.20 \pm 0.89	3.66 \pm 0.84	0.001
PTH (pg/ml)	133.63 \pm 208.02	104.27 \pm 191.10	0.021
T. cholesterol (mg/dl)	195.79 \pm 43.91	190.60 \pm 47.51	0.209
HDL cholesterol (mg/dl)	47.13 \pm 14.22	49.45 \pm 16.01	0.009
LDL cholesterol (mg/dl)	120.11 \pm 37.73	112.14 \pm 38.95	0.032
Triglyceride (mg/dl)	147.27 \pm 76.42	147.09 \pm 82.64	0.978

Table 3: Correlations of 25(OH)D and HOMA-IR

	25(OH)D		HOMA-IR	
	r	p	r	p
FBG	0,239*	0,031	0,552**	0,001**
Insulin	0,196	0,080	0,984**	0,001**
eGFR	-0,268*	0,015*	-0,293**	0,008**
Calcium	0,238*	0,032*	0,121	0,282
PTH	-0,234*	0,038*	-0,068	0,553
HDL	-0,108	0,350	-0,381**	0,001**
Triglyceride	0,154	0,182	0,425**	0,001**

Conclusions:

There is no correlation between 25(OH)D levels and insulin resistance in CKD patients. Treatment of Dvit deficiency/insufficiency do not correct insulin resistance in this patients.