

Association between 25-hydroxyvitamin D levels and Diabetes

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- Introduction:** A significant body of literature supports that 25(OH)vitD deficiency is associated with insulin resistance. We studied the prevalence of 25(OH)vitD deficiency across the spectrum of glucose metabolism.
- Design:** The study participants (441 total, 362 females (82.1%) and 79 males (17.9%)) had a mean age (\pm SD) of 64.59 (\pm 9.44) years, range: 32 - 92 years. The study population was divided into 2 groups: Individuals with Diabetes (n=184, 33 males), and controls with normal glucose levels (n=257, 46 males).
- Results:** The mean 25(OH)vitD values for males and females patients was 22.9 ± 11.6 and 21.6 ± 11.9 ng/mL respectively, $p=0.815$. The mean 25(OH)vitD \pm SD levels were significantly lower in subjects with diabetes (18.6 ± 10.6 ng/mL) compared to normal subjects (24.2 ± 12.2 ng/mL), $p=0.035$. There was no difference in the mean age of patients and sex distribution between the two groups. 25(OH)vitD deficiency was observed in 49.7% of the entire study population and was significantly more frequent in patients with diabetes compared to controls (60.9 vs 41.6% respectively). Only 26 out of 184 (14.1%) of patients with diabetes had 25(OH)vitD sufficiency and levels above 30ng/ml, compared to 74 out 257 (28.8%) of individuals with normal glucose ($p<0.001$).
- Conclusions:** This study illustrates the higher prevalence of 25(OH)vitD deficiency among patients with diabetes. From a clinical standpoint, specific advice needs to be provided especially to people with diabetes. Vitamin D supplements on a regular basis over the year and adequate sun exposure could be also recommended in order to achieve sufficient levels of 25(OH)vitD.

Table 1. Mean values \pm SD of 25(OH)vitD, age, plasma glucose levels and HbA1c in the two groups of patients .

	Male (N/%)	Age in years	25(OH)vitD (ng/ml)	Glu (mg/dl)	HbA1c (%)
		Mean (\pm SD)	Mean (\pm SD)	Mean (\pm SD)	Mean (\pm SD)
Diabetes n=184	33 /17.9%	64.48 (\pm 10.83)	18.6 (\pm 10.6)	165.9 (\pm 60)	7.81 (\pm 1.35)
Normal n=257	46 / 17.9%	64.66 (\pm 8.32)	24.2 (\pm 12.2)	91.2 (\pm 8.6)	5.38 (\pm 0.2)
p-values			P=0.035	P<0.00 1	P<0.001

Table 2. Counts and percentages of subjects with 25(OH)vitD deficiency(<20 ng/ml), insufficiency(20–<30 ng/ml) and sufficiency (\geq 30 ng/ml) in each group of patients

	vitD deficiency	vitD insufficiency	vitD Sufficiency
Patients with DM (n= 184)	112 (60.9 %)	46 (25%)	26 (14.1%)
Patients without DM (n=257)	107 (41.6 %)	76 (29.6%)	74 (28.8%)

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