

25-hydroxy vitamin D levels among 36728 adult patients in the United Arab Emirates: association with age and BMI and diabetes status

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Introduction: Vitamin D deficiency is endemic in the UAE. Type 2 diabetes mellitus and obesity are also common. We have investigated the possibility of an association between these conditions.

Methods: A retrospective analysis of data on patients over the age of 18 years (n=61812) attending a large diabetes centre in the UAE. Information from patients' last visits including demographic data, glucose tolerance status and 25-hydroxy-vitamin D were analysed. Patients with no information on vitamin D status were excluded. Medication in the treated group included any of the following: oral ergocalciferol 50000 units every 1-2 weeks, oral cholecalciferol 1000 units daily or intramuscular ergocalciferol 300000 units every 2-3 months.

Results: 36728 patients (82.4 % Arab Emirati origin; male/female ratio= 37.5/62.5; age 44.6 ± 14.7 years; BMI 30.3 ± 6.4 kg/m²) were on vitamin D supplements; 8406 patients (73.2 % Arab Emirati; male/female ratio 54.5/ 45.5; age 48.9 ± 15.5 years; BMI 29.9 ± 6.3 kg/m²) did not on take vitamin D supplements. Vitamin D deficiency was present in 58.1 % of the treated and 49.1% of the untreated groups respectively. Among patients with type 2 and type 1 diabetes, there was a significant negative trend in vitamin D level across weight categories (table 1). Vitamin D level was significantly higher in patients with type 2 diabetes compared to subjects with normal glucose tolerance ($p < 0.001$).

25-OH-vitamin D (nmol/l)	BMI <20 kg/m ²	BMI 20-24.9 kg/m ²	BMI 25-29.9 kg/m ²	BMI 30-34.9 kg/m ²	BMI ≥ 35 kg/m ²	p	R ²
NGT [n] M/F	43.4 ± 35.2 190 (39/151)	44.9 ± 25.9 1464 (354/1110)	45.2 ± 24.7 1975 (565/1410)	41.6 ± 23.3 1244 (295/949)	38.9 ± 20.1 58 21/37	<0.0001	0.006
T2DM [n] [M/F]	65.6 ± 31.6 34 19/15	59.8 ± 25.9 1661 1113/548	58.2 ± 24.8 5596 3246 /2350	53.9 ± 23.2 5086 2176/2910	49.4 ± 22.1 3997 (1094/2903)	<0.0001	0.2
T1DM [n] [M/F]	45.2 ± 31.9 28 16/12	46.6 ± 25.1 285 148/1437	45.7 ± 21.7 239 125/114	46.6 ± 21.5 113 65/48	39.6 ± 20.1 58 21/37	>0.34	0.001

Conclusion: Our data indicate a high prevalence of vitamin D deficiency amongst our patients in spite of vitamin D supplements. Our study also indicates a negative effect of BMI on vitamin D status in patients with type 2 diabetes. Higher doses of vitamin D are needed in the obese patients with diabetes in whom compliance would need to be further emphasised.

