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Association of serum vitamin D level and type 2 diabetes with nonalcoholic fatty liver disease

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Abstract

Aim: We aimed to explore the Association of serum vitamin D level and type 2 diabetes (T2DM) with nonalcoholic fatty liver disease (NAFLD).

Methods: In this study, 453 hospitalized patients with T2DM aged over 18 years were included, and the serum vitamin D level was detected by enzyme-linked immunosorbent assay. 453 patients were divided into Sufficient group (≥ 30 ng/ml, $n=70$, 15.45%), Insufficient group ($\geq 20, < 30$ ng/ml, $n=218$, 48.12%), Deficient group ($\geq 10, < 20$ ng/ml, $n=147$, 32.45%), and Severely Deficient group (< 10 ng/ml, $n=18$, 3.97%) based on different serum vitamin D levels. We compare the proportion and severity of nonalcoholic fatty liver disease among the four groups.

Results: The duration of T2DM in Deficiency group and Severe Deficiency group was longer than that in Sufficient group, with a statistically significant difference ($P < 0.05$). The proportion of T2DM patients suffering from NAFLD was as high as 84.99% (385/453), including 77.14% (54/70) in the Deficiency group, 87.16% (190/218) in the Insufficient group, 85.03% (125/147) in the Deficient group, and 88.89% (16/18) in the Severely Deficient group. There was a statistically significant difference between the Insufficient or Deficient group and the Sufficient group ($P < 0.001$). In addition, 66% of patients in the Insufficient or Deficient group had moderate to severe fatty liver disease, while only 23% in the Sufficient group had moderate to severe NAFLD.

Conclusion: The serum vitamin D level in patients with T2DM is significantly lower, and the longer course of diabetes, the lower vitamin D level. The proportion of T2DM patients with NAFLD is as high as 84.99%, but the proportion of diabetes patients with adequate vitamin D levels with NAFLD is significantly lower than that of patients with vitamin D deficiency, and the more severe the vitamin D deficiency, the more severe the fatty liver. It suggests that appropriate vitamin D supplementation may reduce the occurrence and development of diabetes patients with NAFLD.

Keywords: Vitamin D; Vitamin D deficiency; Type 2 diabetes; Nonalcoholic fatty liver disease

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