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

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Aim and background

Vitamin D (calciferol) is a fat-soluble vitamin that has a significant role in phospho-calcium metabolism, maintaining normal calcium levels and bone health development, vitamin D is also involved in cell growth and differentiation and immune function.

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 (≥30ng/ml, n=70, 15.45%), Insufficient group (≥20,<30ng/ml, n=218, 48.12%), Deficient group (≥10,<20ng/ml, n=147, 32.45%), and Severely Deficient group (<10ng/m, 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<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:

Conflict

The authors state that they have no conflicts of interest in this work.

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