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Patients with new onset diabetes after liver transplantation have higher sclerostin levels that tend to decrease after an oral glucose tolerance test

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Introduction

Decreased bone formation has been proposed as a mechanism involved in the higher risk of fractures in diabetes mellitus. Sclerostin (Scl) is an osteocyte-derived inhibitor of the Wnt/beta-catenin signaling pathway (acting as a negative regulator of bone formation). Some clinical studies have found increased serum sclerostin in patients with type 1 and type 2 diabetes , but there are no information about the relationship between sclerostin and new onset diabetes after transplantation (NODAT).

Aim

The aim of our study is to evaluate sclerostin serum levels in a cohort of patients with liver transplantation (LT).

Patients and methods

85 LT patients (50 males, 35 females) without previous diabetes mellitus were included in this single-center and cross-sectional study. A 75 g oral glucose tolerance test was performed (OGTT) and diagnostic ADA criteria were followed. Biochemical data included: Plasma glucose (PG), serum insulin and C-peptide (baseline, 60 and 120 min after OGTT); glycated hemoglobin (HbA1c) and creatinine. Serum sclerostin was measured in fasting, 60-minute and 120-minute samples during OGTT (Enzyme immunoassay, TECOmedical). Data are presented as mean (± SD). Pearson's correlation and multiple regression analysis were used to assess the relationships between variables. MANOVA test were used to evaluate the evolution of sclerostin levels (baseline to 120-minute). Significance level was 0.05.

Results

48 patients (64%) showed normal glucose tolerance (NGT), 31 (36.4%) prediabetes and 6 NODAT (7.05%). Basal sclerostin was: 0.70±0.27 ng/ml (NGT); 0.83±0.31 ng/ml (prediabetes) and 1.75±1.20 ng/ml (NODAT). 60-minute sclerostin was: 0.65±0.22 ng/ml (NGT); 0.71±0.20 ng/ml (prediabetes) and 1.55±1.24 ng/ml (NODAT). 120-minute sclerostin was: 0.69±0.23 ng/ml (NGT); 0.75±0.20 ng/ml (prediabetes) and 1.48±1.10 ng/ml (NODAT). Sclerostin levels were significantly higher in NODAT patients at baseline ($p<0.001$); 60-minute ($p<0.001$) and 120-minute ($p=0.001$). During the OGTT, sclerostin showed a significant decrease ($p=0.01$), which was more pronounced in the NODAT group, with a percent of change of: -0.32 ± 0.64.

	NGT	Prediabetes	NODAT
Patients	48 (64%)	31 (36.4%)	6 (7.05%)
Basal SCL	0.70±0.27	0.83±0.31	1.75±1.20
60-minute SCL	0.65±0.22	0.71±0.20	1.55±1.24
120-minute SCL	0.69±0.23	0.75±0.20	1.48±1.10

Table 1. Mean sclerostin values in patients with NGT, prediabetes and NODAT.

Conclusions

Our results show that after LT sclerostin levels are higher in patients with NODAT than in patients with prediabetes or NGT. Also, we have found that during an OGTT sclerostin significantly decrease, particularly in NODAT patients. Based on our results, we suggest further studies to investigate a plausible link between higher levels of sclerostin in NODAT patients and their increased fracture risk.

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