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P-117 - METABOLOMIC AMINO ACIDS AND TRICARBOXYLIC ACID CYCLE INTERMEDIATES AS MARKERS OF SUBCLINICAL CARDIAC AUTONOMIC DYSFUNCTION IN ADULTS PATIENTS WITH TYPE 1 DIABETES

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Resumen

Objectives: Non-glycemic metabolic intermediates may contribute to the development of microangiopathic complications in individuals with type 1 diabetes. We aimed to evaluate the association between metabolic intermediates (TCA cycle metabolites and amino acids) and measures of cardioautonomic neuropathy (CAN) in these patients.

Material and methods: We evaluated 332 subjects with type 1 diabetes (46% female, mean age 41±13 years, diabetes duration 19 ± 11 years, and A_{1c} 7.3 ± 1.0%) using a cross-sectional design (ClinicalTrials.gov Identifier:*NCT04950634*). We defined a CAN diagnosis by Ewing's score and power spectral heart rate data: low Frequency (LFa) and high Frequency (HFa) activity. We measured fasting plasma metabolites by nuclear magnetic resonance (NMR). NMR spectra were recorded on a Bruker Avance III spectrometer operating at a proton frequency of 600 MHz. One-dimensional 1H pulse experiment was carried out using 1D Carr-Purcell-Meiboom-Gill (cpmg) spectra to obtain low molecular weight metabolites.

Results: The prevalence of CAN was 27% (95%CI 23; 32). Patients with CAN had lower amino acid levels—valine, isoleucine and threonine— (200 *vs.* 213, p = 0.014; 31 *vs.* 37, p = 0.003; and 228 *vs.* 242, p = 0.032, respectively) and higher lactate levels (385 *vs.* 335, p = 0.012) compared with subjects without CAN. Total Ewing’s score directly correlated with circulating lactate and indirectly with valine, isoleucine and threonin levels. LFa and HFa negatively correlated with circulating lactate levels. Cardioautonomic tests negatively correlated with isoleucine and valine levels. CAN was associated (R^2 = 0.149; p < 0.001) with isoleucine [β 0.960 (95%CI 0.932; 0.988)] and lactate [β 1.002 (95%CI 1.000; 1.004)] regardless plasma glucose and duration of type 1 diabetes.

Conclusions: Serum amino acids and metabolites of the TCA cycle could be useful as markers of CAN in type 1 diabetes.