Association of trace elements with lipid profiles and glycaemic control in patients with type 1 diabetes mellitus in northern Sardinia.

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Aim:
Sardinia is an Italian region with a high incidence of type 1 diabetes mellitus (T1DM). This study aimed to determine the associations of trace elements (zinc [Zn], copper [Cu], selenium [Se], chromium [Cr], and iron [Fe]) with lipid profiles and glycaemic control (HbA1c %) in patients with T1DM.

Methods:
A total of 192 patients with T1DM who attended the Unit of Diabetology and Metabolic Diseases in Sassari, Italy, were enrolled. Trace elements were measured in whole blood by sector field inductively coupled plasma mass spectrometry (ICP-MS). The data have been incorporated into a software Access and the correlations between metabolic variables and the levels of trace elements were determined.

Results:
Among 192 samples, 56.25% male and 43.75% female. Zinc was positively correlated with total cholesterol (TC) \( P = 0.023 \), low-density lipoprotein (LDL) \( P = 0.0015 \), and triglycerides (TG) \( P = 0.027 \). Iron was significantly correlated with TC \( P = 0.0189 \), LDL \( P = 0.0121 \), and high-density lipoprotein (HDL) \( P = 0.0466 \). In males, Cr was positively correlated with HDL \( P = 0.0079 \) and Se, in females was correlated with TG \( P = 0.0113 \). The mean fasting plasma glucose (FPG) was 166.2 mg/dL. Chromium was correlated with FPG \( P = 0.0149 \), particularly in males \( P = 0.0038 \). Overall, 63.5% of the patients had moderate HbA1c (7%–9%). Copper was significantly correlated with HbA1c % in males \( P = 0.0155 \).

Conclusion:
The results of this study indicate that trace elements show different associations with lipid levels and glycaemic control in T1DM. Zinc, Fe, and Se were associated with lipid levels whereas Cu and Cr were associated with HbA1c %.