The effect of chromium picolinate and biotin supplementation on glycemic control in poorly controlled patients with type 2 diabetes mellitus: a placebo-controlled, double-blinded, randomized Trial
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Singer GM, Geohas J.
Section of Cardiovascular Medicine, Yale University School of Medicine, New Haven, Connecticut 06520-8017, USA. Gregory.singer@yale.edu
BACKGROUND: Preclinical studies have shown that the combination of chromium picolinate and biotin significantly enhances glucose uptake in skeletal muscle cells and enhances glucose disposal. The present pilot study was conducted to determine if supplementation with chromium picolinate and biotin can improve glycemic control in patients with type 2 diabetes mellitus with suboptimal glycemic control despite use of oral antihyperglycemic agents. METHODS: Forty-three subjects with impaired glycemic control (2-h glucose >200 mg/dL; glycated hemoglobin >or=7%), despite treatments with oral antihyperglycemic agents, were randomized to receive 600 microg of chromium as chromium picolinate and biotin (2 mg/day) (Diachrome®, Nutrition 21, Inc., Purchase, NY) in addition to their prestudy oral antihyperglycemic agent therapy. Measurements of glycemic control and blood lipids were taken at baseline and after 4 weeks. RESULTS: After 4 weeks, there was a significantly greater reduction in the total area under the curve for glucose during the 2-h oral glucose tolerance test for the treatment group (mean change -9.7%) compared with the placebo group (mean change +5.1%, P < 0.03). Significantly greater reductions were also seen in fructosamine (P < 0.03), triglycerides (P < 0.02), and triglycerides/high-density lipoprotein cholesterol ratio (P < 0.05) in the treatment group. No significant adverse events were attributed to chromium picolinate and biotin supplementation. CONCLUSIONS: This pilot study demonstrates that supplementation with a combination of chromium picolinate and biotin in poorly controlled patients with diabetes receiving antidiabetic therapy improved glucose management and several lipid measurements. Chromium picolinate/biotin supplementation may represent an effective adjunctive nutritional therapy to people with poorly controlled diabetes with the potential for improving lipid metabolism.

Chromium picolinate and biotin combination reduces atherogenic index of plasma in patients with type 2 diabetes mellitus: a placebo-controlled, double-blinded, randomized clinical trial
Geohas J, Daly A, Juturu V, Finch M, Komorowski JR.
Chicago Research Center, Chicago, Illinois, USA.
BACKGROUND: The atherogenic index of plasma (AIP), defined as logarithm [log] of the ratio of plasma concentration of triglycerides to high-density lipoprotein (HDL) cholesterol, has recently been proposed as a predictive marker for plasma atherogeneity and is positively correlated with cardiovascular disease risk. The nutrient combination of chromium picolinate and biotin (CPB) has been previously shown to reduce insulin resistance and hyperglycemia in patients with type 2 diabetes (T2DM). METHODS: Thirty-six moderately obese subjects with T2DM and with impaired glycemic control were randomized to receive CPB or placebo in addition to their oral hyperglycemic agents for 4 weeks. Measurements of blood lipids (including ratio of triglycerides to HDL cholesterol), fructosamine, glucose, and insulin were taken at baseline and after 4 weeks. RESULTS: At the final visit, the active group had a significantly lower AIP compared to the placebo group (P < 0.05). A significant difference in triglyceride level (P < 0.02) and the ratio of low-density lipoprotein (LDL) to HDL cholesterol (P < 0.05) was also observed between the groups at the final visit. In the active group, the changes in urinary chromium levels were inversely correlated with the change in AIP (P < 0.05). Urinary chromium levels were significantly increased in the CPB group. In the CPB group, glucose levels decreased at 1 hour and 2 hours and glucose area under the curve and fructosamine level were significantly decreased. Ratios of total to HDL cholesterol, LDL to HDL cholesterol, and non-HDL to HDL cholesterol were significantly decreased between the treatments at final visit. No significant adverse events were observed in the CPB or placebo groups. CONCLUSIONS: These results suggest that the combination of chromium picolinate and biotin may be a valuable nutritional adjuvant therapy to reduce AIP and correlated CVD risk factors in people with T2DM.