

Single-dose chromium supplementation improves postprandial glycemia in men with slightly impaired glucose metabolism

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The essential trace element chromium (Cr) has an effect on glucose metabolism through its action on insulin. Our aim was to investigate which metabolic and/or dietary factors influence the effects of acute Cr supplementation on postprandial glycaemic response. Twenty-six apparently healthy young men were tested in a single-blind, randomized crossover study. Each subject consumed on two separate occasions a white bread test meal providing 75 g of available carbohydrates, once with a placebo and once supplemented with 400 µg Cr (as chromium picolinate). Blood samples were obtained twice before ingestion of the test meal and six times afterward. The capillary glucose area under the curve (AUC) was significantly reduced (-20 %, $P < 0.01$) after Cr supplementation in those subjects with a glucose AUC above the median during the placebo trial, while the AUC did not differ between trials in the other half of the subjects. We found no differences in the insulin AUC between the two trials. The response to supplemental Cr could not be associated to any factors (e.g. iron, transferrin, ferritin, nutrient intake) other than “glucose tolerance”. In conclusion, acute Cr supplementation improved the glycaemic response to a high-glycaemic meal only in a subgroup of individuals with slightly poorer glucose control (glucose AUC > median). This suggests that supplemental Cr may be most effective in individuals with poorer glucose tolerance like overweight or elderly people.