COMMENTS AND RESPONSES

Effect of Chromium Supplementation on Glucose Metabolism and Lipids: A Systematic Review of Randomized Controlled Trials

Response to Kleefstra, Houweling, and Bilo

We thank Kleefstra et al. for their comments (1) on our review (2), and we appreciate the opportunity to respond. We agree that the available trials on chromium supplementation are of poor quality and have heterogeneous results. Our approach toward systematic review is to not exclude studies based on what are inevitably subjective decisions about quality, applicability, or heterogeneity.

A subanalysis of the chromium picolinate trials excluding Anderson et al. (3), because of its quality and its large effect, produced a smaller, though still statistically significant, summary estimate of the effect of chromium supplementation on A1C (−0.3% [95% CI −0.5 to −0.1]). However, such an approach toward meta-analysis is arguably arbitrary. We preferred a broader assessment, whereby we found that poorer-quality studies had significantly greater favorable net effects on A1C than high-quality studies. The overall poor quality of the evidence clearly limits any conclusions that are drawn about the effect of chromium supplementation.

We hoped to be able to categorize studies by the baseline chromium status of included participants. Unfortunately, we did not find any useful, consistent marker of chromium status across studies. We believed that the countries where the trials were conducted were of interest, but we were concerned that any such division (e.g., Western vs. non-Western) would be arbitrary and would not necessarily represent a reliable proxy for differences in baseline chromium nutrature. As suggested by Kleestra et al. we reran analyses comparing Western (U.S., Europe, and Israel) and non-Western (all other) countries. For A1C, the larger effect found in the small number of trials from non-Western countries was driven primarily by the Anderson study. For fasting glucose in participants with diabetes, the 15 Western trials of chromium found a smaller effect (−0.5 mmol/l [95% CI −1.1 to 0.1]) than the 6 non-Western trials (−1.8 mmol/l [−2.6 to −0.9]) (P = 0.0003). The small number of non-Western trials precluded a meaningful analysis of the individual chromium formulations. However, given the variation in diet and other features across both Western and non-Western countries, the interpretation of these results is unclear.

We agree that well-conducted trials in clearly defined populations (preferably with an indicator of chromium status) are needed before definitive conclusions can be made about the value of chromium supplementation.

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DOI: 10.2337/dc07-1121

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