dislipidaemia associated with atherosclerotic disease systemically alters the DC function. As highlighted in the review, the accumulated evidence indicates that DCs might be importantly involved in plaque destabilization. I agree with Bauriedel and co-workers that the impact of DCs on plaque destabilization requires clarification.

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Heart failure improvement from a supplement containing copper

Witte et al. improved ventricular function and quality of life in septuagenarian patients with chronic heart failure and ischaemic heart disease by supplementation with multiple micronutrients. The authors suggested that their regimen may provide relief from multiple deficiencies, reduction in oxidative stress, and be a first step towards identifying elements that can be eliminated from the supplement without loss of benefit. Copper is an antioxidant nutrient for cardiovascular health that may have contributed to their success.

The Western diet is often low in copper, according to the pooled data from several articles on more than 900 diets chemically analysed. About 62% and 36% of diets of 80 randomly selected adults in Baltimore were below the recommended dietary allowance and the estimated average requirement for adults, respectively, 0.9 and 0.7 mg daily. Copper deficiency is the only nutritional insult that elevates cholesterol, blood pressure, homocysteine, and uric acid, has adverse effects on electrocardiograms and arterioles, impairs glucose tolerance, and promotes thrombosis and oxidative damage. More than 80 anatomical, chemical, and physiological similarities between animals deficient in copper and people with ischaemic heart disease have been identified. Copper deficiency in animals can induce cardiac enlargement, pleural effusion, and heart failure that are reversible with copper supplementation.

Dietary supplements including copper in this context may be inexpensive therapy rather than expensive placebos. The small size of this trial reveals that a follow-up trial can be relatively inexpensive and need not involve hundreds or thousands of people common in heart disease research. Perhaps, a trial with two to three times as much copper and a decrease in vitamins to nearer international recommended intakes will produce benefit in a shorter time.

References

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Heart failure improvement from a supplement containing copper: reply

We are grateful for the comments by Prof. Klevay and we agree that copper supplementation in a population of elderly heart failure patients could have significant benefits. Our choice of agents and daily intakes in the study were generally made on the basis of previous animal and human work. However, although there are data on the prevalence and potential effects of copper deficiency, there are few about supplemental doses in humans at risk of deficiency. We were therefore cautious, choosing 1.2 mg per day based on recommended daily intakes.

The recent MAVIS study has demonstrated that multiple micronutrient supplementation is not of benefit in reducing morbidity from infections in otherwise well ambulatory elderly patients. However, patients with long-term multi-system illnesses, such as chronic heart failure (CHF), might be more likely to have important relative deficiencies in multiple micronutrients due to reduced intake, increased degradation because of...