

Iodine supplements reduce cardiovascular disease risk factors in women

Excerpted from: Herter-Aeberli I et al. Iodine Supplementation Decreases Hypercholesterolemia in Iodine-Deficient, Overweight Women: A Randomized Controlled Trial. The Journal of Nutrition, July 22, 2015

A randomized controlled trial in Morocco shows that iodine supplementation improves the lipid profile in overweight women who are moderately or severely iodine deficient.

In iodine deficiency, thyrotropin (TSH) levels increase to stimulate iodine uptake by the thyroid. In moderately-to-severely iodine deficient areas, many adults have elevated TSH with serum thyroxine (T4) and triiodothyronine (T3) levels in the normal range: a pattern consistent with subclinical hypothyroidism. Because iodine deficiency continues to affect approximately one-third of the global population, it remains a common cause of subclinical hypothyroidism worldwide. Iodine repletion of iodine-deficient individuals normalizes their increased serum TSH. Studies have shown that overt and subclinical hypothyroidism may increase the risk of dyslipidemia, and in some studies subclinical inflammation. Even within the normal TSH range, and in iodine sufficient populations, higher TSH predicts higher total cholesterol, higher BMI, and mortality from coronary artery disease. In this study, the authors investigated whether correcting iodine status would not only reduce serum TSH but also lower and normalize the elevated blood lipids.

Double burden of malnutrition in Moroccan women

Morocco has enacted national legislation which mandates compulsory salt iodization, but because of poor compliance by the salt industry and a lack of enforcement many regions remain iodine deficient. The national median urinary iodine concentration (UIC) in children is only 69 µg/L. At the same time, Morocco has seen a rapid increase in rates of overweight and obesity as well as elevated blood lipids and type 2 diabetes. The trial was conducted from December 2013 to May 2014 at the district health center of Amizmiz, southern Morocco, in the foothills of the Atlas Mountains. Previous studies reported that young women in the region were iodine deficient. The authors enrolled 163 women between the ages of



Overweight increases the risk of elevated blood lipids.

20 and 50 (premenopausal) and with a BMI between 27 and 40 (overweight or obese). The women were assigned at random to receive treatment (200 µg daily potassium iodide tablets) or placebo (identical-looking tablets without any iodine) for six months.

Iodine supplementation lowers plasma TSH and elevated lipids

After six months, the women who received iodine had a clearly improved iodine status and a modestly improved thyroid function. The median UIC increased from 38 (95% CI: 34–45) µg/L to 77 (95% CI: 59–89) µg/L, and TSH was 33% lower in the treatment group than in the placebo group. Iodine treatment also had a clear impact on the prevalence of elevated blood lipids: after six months, total cholesterol in women who had elevated cholesterol at baseline was reduced by 11%, and only about a fifth of treated women remained hypercholesterolemic (vs. 34.8% in the placebo group). Iodine had no significant effect on HDL cholesterol or TGs, which is consistent with other studies.

A correlation between TSH and serum lipids, even within the normal range of TSH, has been identified before. In the Nort-Trondelag Health Study in >30,000 euthyroid individuals, serum TSH was significantly positively correlated with total cholesterol, LDL cholesterol, and TGs and negatively associated with HDL cholesterol. Among euthyroid Hispanic individuals (n = 2771), after adjustment for age, sex, and BMI, serum TSH was positively associated with total cholesterol and TGs.

Overweight and obesity in women increases the risk of subclinical hypothyroidism, hyperlipidemia, insulin resistance, and subclinical inflammation. It is not clear why TSH concentration is higher in obesity or whether it could be an independent risk factor for cardiovascular disease. One potential link is leptin, the adipocyte-derived hormone which is increased with increasing body fat, and which has been linked to subclinical inflammation.

More studies are needed

Although the median UIC almost doubled as a result of iodine supplementation, at six months it remained below 100 µg/L, the WHO cut-off indicating adequate intake. It is likely that the progressive reduction in total cholesterol might be even greater if followed until optimal iodine status has been achieved. Further research should also determine whether these findings can be applied to other populations with varying severity of iodine deficiency and metabolic risk factors.

If confirmed, this effect may also be important in many higher-income countries, such as Russia, Finland, or Italy, where iodine deficiency persists and there is a growing prevalence of obesity and cardiovascular disease.