Paleolithic weight-loss diet puts women at risk of iodine deficiency


A Paleolithic-type weight-loss diet (known as paleo diet or PD) has beneficial metabolic effects, but it excludes two largest iodine sources: table salt and dairy products. A 2-year randomized trial compared the risk of iodine deficiency in Swedish women on a PD compared with the Nordic Nutrition Recommendations (NNR) diet.

The Paleolithic diet is composed of ingredients consumed by humans before the establishment of agriculture. Therefore, it excludes grains, legumes, dairy products, refined sugar, processed oils, and salt. In short-term studies, PD has been beneficial for weight reduction and metabolic balance, and had positive long-standing effects on fat mass, abdominal obesity and triglyceride levels (1–3).

In Sweden, >50% of the iodine intake comes from iodized table salt, with dairy products and seafood as additional important iodine sources (4). Therefore, it is concerning that long-term use of a paleo diet may lower iodine intakes. The Nordic Nutrition Recommendations (NNR) advise that adults should consume 150 µg iodine/day.

A randomized controlled trial was performed in August 2007–March 2010 at a tertiary referral center in Umeå, Sweden. Seventy healthy postmenopausal women with a body mass index (BMI) ≥ 27 kg/m² were enrolled and randomized to either a PD (n=35) or a NNR weight-loss diet (n=35). Dairy products, cereals, beans, refined fats and sugar, added salt, bakery products, and soft drinks were excluded from the paleo diet. Processed, canned, and preserved food, and processed and semi-processed foods were avoided.

Forty-nine subjects fulfilled the protocol (NNR: n=22, PD: n=27). Both diets resulted in a reduction in body weight and fat mass, and the reported energy intake decreased similarly in both groups.

Intake of iodine-rich foods

After 6 months, the women on a PD had doubled their reported intake of fish, seafood, spawn and caviar (from 46.1 to 97.1 g/day). Simultaneously, they decreased their intake of dairy from 269 to 7.4 g/day, and cheese from 28.9 to 1.6 g/day. Intakes of bread, cereals, and ice-cream decreased as well. This new dietary pattern was sustained for 24 months (data not shown). In the NNR group, the intake of iodine-rich foods remained constant (data not shown).

Iodine status

24-hour urinary iodine concentration (24-UIC) was measured at baseline, and at 6 and 24 months. Because 24-UIC is strongly dependent on urinary volume, it was converted to 24-hour urinary excretion (24-UIE) using urinary volumes. At baseline, the overall median 24-UIE was 136.0 µg/d and similar in both groups, which means that the subjects were iodine sufficient. After 6 months, 24-UIE decreased to 77.0 µg/d (p=0.001) in the PD group, which is consistent with mild iodine deficiency. In the NNR group, the urinary iodine levels remained unchanged.

This is the first study to demonstrate that long-term use of a Paleolithic diet could increase the risk of insufficient iodine intakes. This adverse effect is valid for all countries, regardless of whether they have salt iodization programs. In this study, salt intakes were similar in both groups, suggesting that consumers may find it difficult to exclude all salt, some of which is hidden. Therefore, it is possible that, in countries without an iodization program, PD could lead to more severe iodine deficiency than in this study. An increased risk of mild iodine deficiency is particularly dangerous in women of reproductive age, especially if they are planning a pregnancy, when the need for iodine increases. The authors suggest that pregnant women should avoid the Paleolithic diet altogether, and recommend that non-pregnant women on PD consider iodine supplementation. Iodine deficiency is an ongoing concern, as exemplified by its re-emergence in the UK, and awareness of new risk groups is necessary.

References