Effect of low energy diet for eight weeks to adults with overweight or obesity on folate, retinol, vitamin B12, D and e status and the degree of inflammation: a post hoc analysis of a randomized intervention trial

Background: Obesity is associated with vitamin insufficiency and low grade inflammation. The purpose of this study was to investigate the effect of weight loss on folate, retinol, vitamin B12, D and E status and the degree of inflammation.

Methods: Out of 110, 85 individuals (75% women) aged 39 ± 11 years with a mean ± SD BMI of 33 ± 4 kg/m², completed an eight-week low energy diet (LED). Serum concentration of folate, retinol, B12, D and E and C-reactive protein and homocysteine (Hcy) were measured at baseline and at end of the LED. Results: At baseline, 8% of the participants were deficient in folate, 13% in vitamin B12, 2% in retinol, 28% in vitamin D (72% were insufficient in vitamin D), and none were deficient in vitamin E. At baseline, BMI was inversely associated with retinol (P < 0.05) as was total and abdominal fat percentage with folate (P < 0.05); further BMI and measures of adiposity were positively associated with CRP (P < 0.01) and Hcy (P < 0.05). Homocysteine was inversely associated with all vitamins but retinol (P < 0.001). After the LED, the participants lost a mean [95% confidence intervals] of 12.3 [- 13.1,-11.6] kg. The serum concentration of folate, vitamin B12 and D were increased (P < 0.001) after the LED whereas the concentration of retinol and vitamin E were reduced (P < 0.001). Conclusion: Eight-weeks LED resulted in 13% weight loss and an increase in the serum concentrations of folate, vitamin B12 and D. Baseline adiposity was inversely associated with folate and retinol, and positively associated with markers of inflammation. Trial registration: Ethical Committee of Copenhagen as no. H-4-2013-135, NCT01561131.