Adipose tissue trans fatty acids and changes in body weight and waist circumference


Publication date: 2013

Document Version
Peer reviewed version

Link back to DTU Orbit

Adipose tissue *trans* fatty acids and changes in body weight and waist circumference

C.P. Hansen¹, ², ³, T.L. Berentzen³, J.N. Østergaard¹, ², C.C. Dahm¹, L.I. Hellgren⁴, E.B. Schmidt², A. Tjønneland⁵, T.I.A. Sørensen³, ⁶, K. Overvad¹, ² and M.U. Jakobsen¹

¹ Section for Epidemiology, Department of Public Health, Aarhus University, Aarhus, Denmark; ² Department of Cardiology, Center for Cardiovascular Research, Aalborg Hospital, Aarhus University Hospital, Aalborg, Denmark; ³ Institute of Preventive Medicine, Bispebjerg and Frederiksberg University Hospitals, The Capital Region, Copenhagen, Denmark; ⁴ Department of Systems Biology, Technical University of Denmark, Lyngby, Denmark; ⁵ Danish Cancer Society Research Center, Copenhagen, Denmark; ⁶ Novo Nordisk Foundation Center for Basic Metabolic Research, University of Copenhagen, Copenhagen, Denmark

**Introduction:** Previous studies have suggested that intake of *trans* fatty acids (TFA) may play a role in the development of obesity. For fatty acids not synthesized endogenously in humans, such as TFA, the proportions in adipose tissue tend to correlate well with the habitual dietary intake. Biomarkers may provide a more accurate measure of habitual TFA intake than dietary questionnaires. Our objective was to investigate the associations between specific TFA in adipose tissue and subsequent changes in body weight and waist circumference (WC).

**Methods:** TFA concentrations in adipose tissue biopsies from a random sample of 1869 men and women aged 50-64 y drawn from a large Danish cohort study were determined by gas chromatography. Baseline data on weight, WC and potential confounders were available together with information on weight and WC five years after enrolment. TFA were divided into three groups: 18:1 Δ6-10t, vaccenic acid (18:1 Δ11t) and rumenic acid (18:2 Δ9c, 11t). The data were analysed using multiple regression with cubic spline modelling.

**Results:** The median proportion of total adipose tissue 18:1t was 1.17 % (90 % central range: 0.72, 1.74) in men and 1.13 % (0.74, 1.71) in women. No significant associations were observed between total 18:1t, 18:1 Δ6-10t, vaccenic acid or rumenic acid and changes in weight or WC.

**Conclusion:** The present study suggests that the proportions of specific TFA in adipose tissue are not associated with subsequent changes in weight or WC within the exposure range observed in this population.

1. **Conflict of interest:**
   None disclosed

2. **Funding:**
   This work is part of the project Health Promoting Effect of Milk-Derived Products, which is supported by the Danish Council for Strategic Research (Contract 2101-08-0053) and the Danish Dairy Research Foundation, and part of the research program of the Danish Obesity Research Centre (DanORC, www.danorc.dk), which is supported by the Danish Council for Strategic Research (Contract 2101-06-0005). The Danish Cancer Society financed the Diet, Cancer and Health cohort study.