0030

Fat mass paradox and carotid intima-media thickness progression: A longitudinal study from childhood through young adulthood

Andrew O. Agbaje MD, MPH1, Alan R. Barker PhD2, Tomi-Pekka Tuomainen MD, PhD1

1Institute of Public Health and Clinical Nutrition, School of Medicine, University of Eastern Finland, Kuopio, Finland; 2Children's Health and Exercise Research Centre, Sport and Health Sciences, University of Exeter, Exeter, United Kingdom.

Abstract

Background: The obesity or body mass index (BMI) paradox has been reported in adults where obesity was associated with decreased cardiovascular morbidity and mortality. However, longitudinal evidence from childhood in relation to markers of subclinical atherosclerotic cardiovascular disease in early adulthood is lacking.

Objective: To examine the cumulative effect of fat mass from ages 9–24 years on changes in carotid intima-media thickness (cIMT) from 17–24 years.

Methods: We included 3863 participants (56% females) from the Avon Longitudinal Study of Parents and Children, England, UK. Total and trunk fat mass were measured by dual-energy Xray absorptiometry at 9, 17, and 24 years while cIMT was measured by ultrasound at 17 and 24 years. We categorized fat mass in tertiles of low (reference), moderate, and high. Participants at ages 24 years were grouped according to BMI class: normal-weight (<24.99 kg/m2) and overweight/obesity (>24.99 kg/m2). We conducted linear mixed-effect model analyses per BMI class, adjusting for age, sex, cardiometabolic, and lifestyle factors.

Results: Altogether, 19.6% and 37.2% were overweight/obese at ages 17 and 24 years, respectively. Among normal-weight participants, a 15-year cumulative high exposure to total fat mass effect estimate -0.011 mm [(-0.022 to -0.0003); p=0.044] and trunk fat mass -0.013 mm [(-0.024 to -0.002); p=0.027] were inversely associated with the 7-year increase in cIMT. Total or trunk fat mass was not associated with cIMT among overweight/obese participants.

Conclusion: Cumulative high exposure to fat mass from childhood may attenuate cIMT progression in normal-weight young adults, suggesting a ‘fat mass paradox’.

Keywords: Obesity paradox, atherosclerosis, adolescence, preventive cardiology

Abbreviations: BMI- Body Mass Index; cIMT- Carotid intima-media thickness.

Funding and Conflicts of Interest

The authors have no conflict of interest.
The UK Medical Research Council and Wellcome (Grant ref: 217065/Z/19/Z; 076467/Z/05/Z) and the University of Bristol provide core support for ALSPAC. The British Heart Foundation grant (CS/15/6/31468) funded blood pressure and carotid intima-media thickness. The Medical Research Council grant (MR/M006727/1) supported smoking data collection. Comprehensive list of grants funding is available on the ALSPAC website (http://www.bristol.ac.uk/alspac/external/documents/grant-acknowledgements.pdf); This research (Dr Agbaje) was specifically funded by the Doctoral Program in Clinical Research, Institute of Public Health and Clinical Nutrition, Faculty of Health Sciences, University of Eastern Finland; the Jenny and Antti Wihuri Foundation (Grant no: 00180006); and the North Savo regional and central Finnish Cultural Foundation (Grants no: 65191835 and 00200150).