

Correspondence

Edited by Kiriakos Xenitidis and Colin Campbell

Contents

- The role of diet and obesity in the association between depression and cardiovascular disease
- Authors' reply

The role of diet and obesity in the association between depression and cardiovascular disease

We were interested in the strong associations found by Wium-Andersen et al between ischaemic heart disease and stroke on the one hand and depression on the other.¹ They found no intervening variable that could explain the relationship. Diet was not investigated. Although studies of nutrition and diet can be complex and imprecise, there is evidence that a Mediterranean diet protects against both depression and cardiovascular disease.^{2,3} The authors had access only to total serum cholesterol levels, but non-high-density lipoprotein (non-HDL) cholesterol may have been relevant. Low HDL and high non-HDL-cholesterol can be risk factors for both depressions and cardiovascular disease.^{4,5} These parameters are heavily influenced by diet. The authors were also constrained by imprecise data on obesity, which was estimated in the study by body mass index (BMI). Obesity is not accurately measured by BMI. A person's percentage of body fat is a good measure of obesity, and this correlates both with depression and with cardiovascular disease, even among people with a BMI within the 'normal' range.⁶ In our opinion, this study could not rule out the possibilities that diet and/or obesity are important intervening variables between ischaemic heart disease, stroke and depression.

Declaration of interest

None.

References

- 1 Wium-Andersen MK, Wium-Andersen IK, Prescott EIB, Overvad K, Jørgensen MB, Osler M. An attempt to explain the bidirectional association between ischaemic heart disease, stroke and depression: a cohort and meta-analytic approach. *Br J Psychiatry* 2020; **217**: 434–41.
- 2 Fresán U, Bes-Rastrollo M, Segovia-Siapco G, Sanchez-Villegas A, Lahortiga F, de la Rosa P et al. Does the MIND diet decrease depression risk? A comparison with Mediterranean diet in the SUN cohort. *Eur J Nutr* 2018; **58**: 1271–82.

- 3 Salas-Salvadó J, Becerra-Tomás N, García-Gavilán J, Bulló M, Barrubés L. Mediterranean diet and cardiovascular disease prevention: what do we know? *Prog Cardiovasc Dis* 2018; **61**: 62–7.
- 4 Lehto S, Niskanen L, Tolmunen T, Hintikka J, Viinamäki H, Heiskanen T et al. Low serum HDL-cholesterol levels are associated with long symptom duration in patients with major depressive disorder. *Psychiatry Clin Neurosci* 2010; **64**: 279–83.
- 5 Ridker P, Rifai N, Cook N, Bradwin G, Buring J. Non-HDL cholesterol, apolipoproteins A-I and B100, standard lipid measures, lipid ratios, and CRP as risk factors for cardiovascular disease in women. *JAMA* 2005; **294**: 326.
- 6 Chen GC, Arthur R, Iyengar NM, Kamensky V, Xue X, Wassertheil-Smoller S, et al. Association between regional body fat and cardiovascular disease risk among postmenopausal women with normal body mass index. *Eur Heart J* 2019; **40**: 2849–55.

John M. Eagles, Temple Clinic, Aberdeen, UK; Samantha J. Robson, Temple Clinic, Aberdeen, UK. Email: jmeagles@icloud.com

doi:10.1192/bjp.2021.79

Authors' reply

We thank Drs Eagles & Robson for their interest in our work and for their insightful comments. The authors discuss that our study did not sufficiently adjust for dietary factors, and further that body mass index (BMI) is a rather imprecise measure for obesity. In the paper the authors refer to, only trunk fat (central obesity) but not whole-body fat nor fat percentage was associated with cardiovascular disease in a cohort of patients with a normal BMI.¹ We fully agree that our study did not account for central obesity or diet, which could potentially explain part of the association we reported.² Consequently, we have looked into our data in order to explore this issue further.

In our study of 93 076 individuals, subsamples of 75 663 and 75 657 had measures of waist circumference and hip circumference, respectively. Both waist circumference and waist-hip ratio have been reported to reflect central obesity. Finally, 55 329 individuals had self-reported information on dietary intake of red meat, fruit, vegetables and fibre, which are key components in the Mediterranean diet.³ When we re-examined the bidirectional associations reported in our paper² in these subsamples before or after adjustment for (a) waist circumference; (b) waist-hip ratio; and (c) dietary intake of red meat, fruit, vegetables and dietary fibre, we did not find that these covariates explained the associations (Table 1). As discussed in our paper, we cannot exclude that changes in lifestyle or medication during follow-up could mediate part of the associations, but must conclude that baseline measures of central obesity and diet did not explain the bidirectional association between depression and cardiovascular disease observed in our study.

Declaration of interest

XXXX.

Table 1 Bidirectional associations between cardiovascular disease and depression before and after adjustment for waist circumference, waist-hip ratio and diet^a

	n	Hazard ratio (95% CI)			
		IHS > depression	Depression > IHS	Stroke > depression	Depression > stroke
Subsample with measured waist circumference	75 663	1.79 (1.38–2.32)	1.78 (1.46–2.17)	2.92 (2.25–3.80)	2.20 (1.81–2.66)
After adjustment for waist circumference	75 663	1.79 (1.38–2.32)	1.80 (1.48–2.20)	2.93 (2.25–3.80)	2.24 (1.85–2.71)
Subsample with measured WHR	75 657	1.79 (1.38–2.32)	1.78 (1.46–2.17)	2.92 (2.25–3.80)	2.20 (1.81–2.66)
After adjustment for WHR	75 657	1.79 (1.38–2.31)	1.78 (1.46–2.17)	2.91 (2.24–3.79)	2.20 (1.82–2.67)
Subsample with measured WHR and diet	55 329	1.73 (1.30–2.30)	1.83 (1.49–2.26)	2.67 (1.99–3.56)	2.21 (1.81–2.72)
After adjustment for WHR	55 329	1.73 (1.30–2.30)	1.84 (1.49–2.26)	2.66 (1.98–3.56)	2.23 (1.82–2.73)
After adjustment for WHR and diet	55 329	1.71 (1.29–2.27)	1.82 (1.48–2.26)	2.64 (1.97–3.53)	2.18 (1.78–2.67)

IHS, ischaemic heart disease; WHR, waist-hip ratio.

a. Diet included self-reported information on red meat, fruits, vegetables and dietary fibre in four different variables.

References

- 1 Chen G-C, Arthur R, Iyengar NM, Kamensky V, Xue X, Wassertheil-Smoller S, et al. Association between regional body fat and cardiovascular disease risk among postmenopausal women with normal body mass index. *Eur Heart J* 2019; **40**: 2849–55.
- 2 Wium-Andersen MK, Wium-Andersen IK, Prescott EIB, Overvad K, Jørgensen MB, Osler M. An attempt to explain the bidirectional association between ischaemic heart disease, stroke and depression: a cohort and meta-analytic approach. *Br J Psychiatry* 2020; **217**: 434–41.
- 3 Trichopoulou A, Costacou T, Bamia C, Trichopoulos D. Adherence to a Mediterranean diet and survival in a Greek population. *N Engl J Med* 2003; **348**: 2599–608.

Marie Kim Wium-Andersen, Center for Clinical Research and Prevention, Bispebjerg and Frederiksberg Hospital, Denmark; **Ida Kim Wium-Andersen**, Psychiatric Center Copenhagen, Denmark; and Institute of Clinical Medicine, University of Copenhagen, Denmark; **Eva Irene Bosano Prescott**, Department of Cardiology, Bispebjerg and Frederiksberg Hospital, Denmark; **Kim Overvad**, Department of Public Health, Aarhus University, Denmark and Aalborg University Hospital, Denmark; **Martin Balslev Jørgensen**, Psychiatric Center Copenhagen, Denmark; and Institute of Clinical Medicine, University of Copenhagen, Denmark; **Merete Osler**, Center for Clinical Research and Prevention, Bispebjerg and Frederiksberg Hospital, Denmark; and Department of Public Health, Section of Epidemiology, University of Copenhagen, Denmark. Email: mariekwa@yahoo.dk

doi:10.1192/bjp.2021.80