

## Letter to the Editor

# Chlorogenic acids, sleep architecture and energy metabolism

Park *et al.*<sup>(1)</sup> conducted a randomised, placebo-controlled, double-blinded cross-over trial to examine the effect of consuming chlorogenic acids (CGA) over 5 d on energy metabolism and sleep quality in humans. They found that the consumption of CGA significantly increased fat oxidation during sleep, and they speculated that it might reduce body fat and prevent obesity. In addition, consumption of CGA enhanced parasympathetic activity, as assessed by heart-rate variability during sleep. However, CGA consumption did not have significant effects on sleep architecture, except for shortened sleep latency. I have some concerns about their study.

First, the authors considered that CGA consumption reduced body fat and body weight. However, a review of the literature yields no clear evidence of a relationship between CGA and these outcomes<sup>(2)</sup>. In addition, a 5-d-long intervention is not representative of continuous consumption of CGA. The study was too short and there is a lack of causality between CGA and the outcomes. Further study is needed for assessing the consumption of CGA and obesity through a longer follow-up period.

Second, insufficient sleep in people with obesity is a risk factor for metabolic disorders<sup>(3)</sup>. Unfortunately, this study observed no significant association between consumption of CGA and change in sleep architecture. It is possible that a 5-d intervention period cannot lead to the improvement of sleep architecture. However, sleep latency significantly became shorter. As such, an interventional study using sleep parameters would be useful in understanding the effect of CGA consumption on sleep quality.

Finally, there is a need for speculation regarding the origin of CGA. If the authors considered coffee as the main source of consumption, the association between consumption of CGA and sleep architecture should be considered according to caffeine intake<sup>(4)</sup>. That said, a meta-analysis reported that both caffeinated and decaffeinated coffee consumption was associated with reduced risk of diabetes<sup>(5)</sup>. Inter-relationships

among sleep, obesity, metabolic disorders and CGA should be further studied.

### Acknowledgements

This research received no specific grant from any funding agency, commercial or not-for-profit sectors.

The author declares that there are no conflicts of interest.

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doi:10.1017/S000711451800020X

### References

1. Park I, Ochiai R, Ogata H, *et al.* (2017) Effects of subacute ingestion of chlorogenic acids on sleep architecture and energy metabolism through activity of the autonomic nervous system: a randomised, placebo-controlled, double-blinded cross-over trial. *Br J Nutr* **117**, 979–984.
2. Tajik N, Tajik M, Mack I, *et al.* (2017) The potential effects of chlorogenic acid, the main phenolic components in coffee, on health: a comprehensive review of the literature. *Eur J Nutr* **56**, 2215–2244.
3. Schmid SM, Hallschmid M & Schultes B (2015) The metabolic burden of sleep loss. *Lancet Diabetes Endocrinol* **3**, 52–62.
4. Hayashi M, Masuda A & Hori T (2003) The alerting effects of caffeine, bright light and face washing after a short daytime nap. *Clin Neurophysiol* **114**, 2268–2278.
5. Ding M, Bhupathiraju SN, Chen M, *et al.* (2014) Caffeinated and decaffeinated coffee consumption and risk of type 2 diabetes: a systematic review and a dose–response meta-analysis. *Diabetes Care* **37**, 569–586.