

Investigating the relation between methylxanthines and plasma lipids in two European populations

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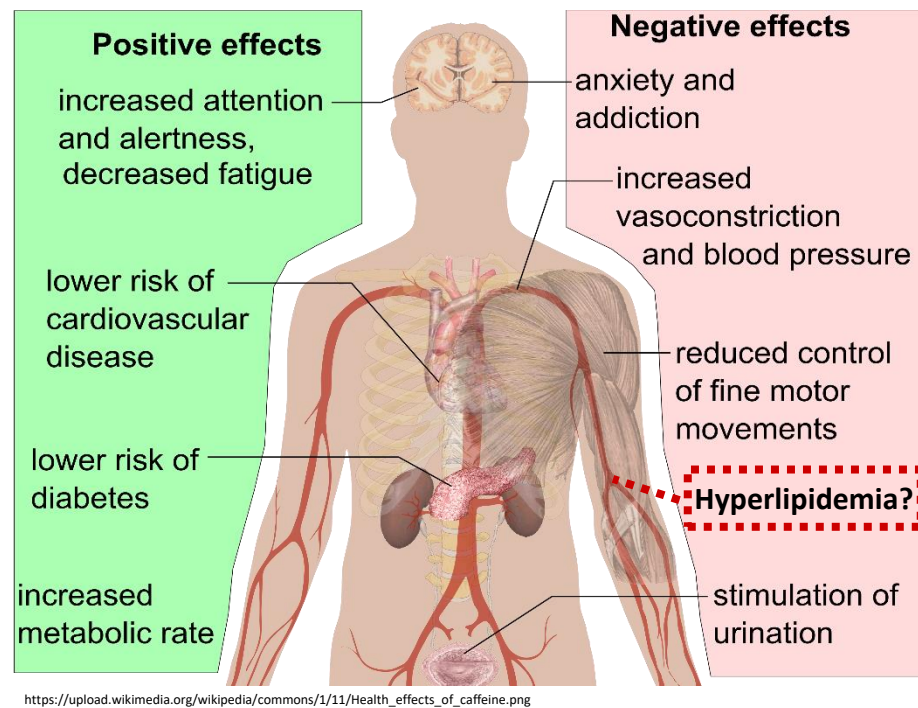


Background & objective

Caffeinated beverages and foods are omnipresent in the human diet, and caffeine-derived metabolites (methylxanthines) have multiple physiological and metabolic effects. Previous studies have suggested that chronic caffeine intake may be associated with abnormally high plasma lipids (hyperlipidemia).

This study investigates the association between plasma and urinary methylxanthines with plasma lipids, using data from two population-based studies

Health effects of caffeine



Results

In both FLEMENGHO and SKIPOGH, plasma caffeine, paraxanthine, and theophylline were positively associated with total cholesterol, LDL cholesterol, and triglycerides, with more consistent gradients in males (**Figures 1-2**). Similar associations were observed for urinary caffeine, paraxanthine and theophylline in SKIPOGH (**Figure 3**).

Fig. 1: Association between plasma caffeine and triglycerides in FLEMENGHO

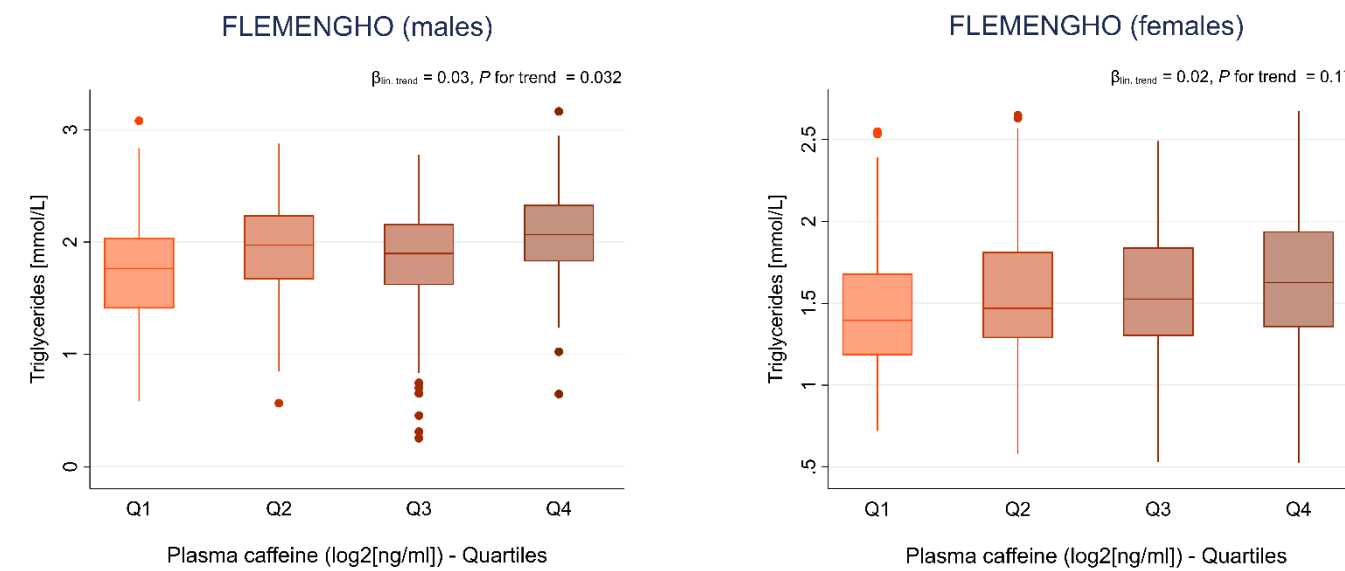


Fig. 2: Association between plasma caffeine and triglycerides in SKIPOGH

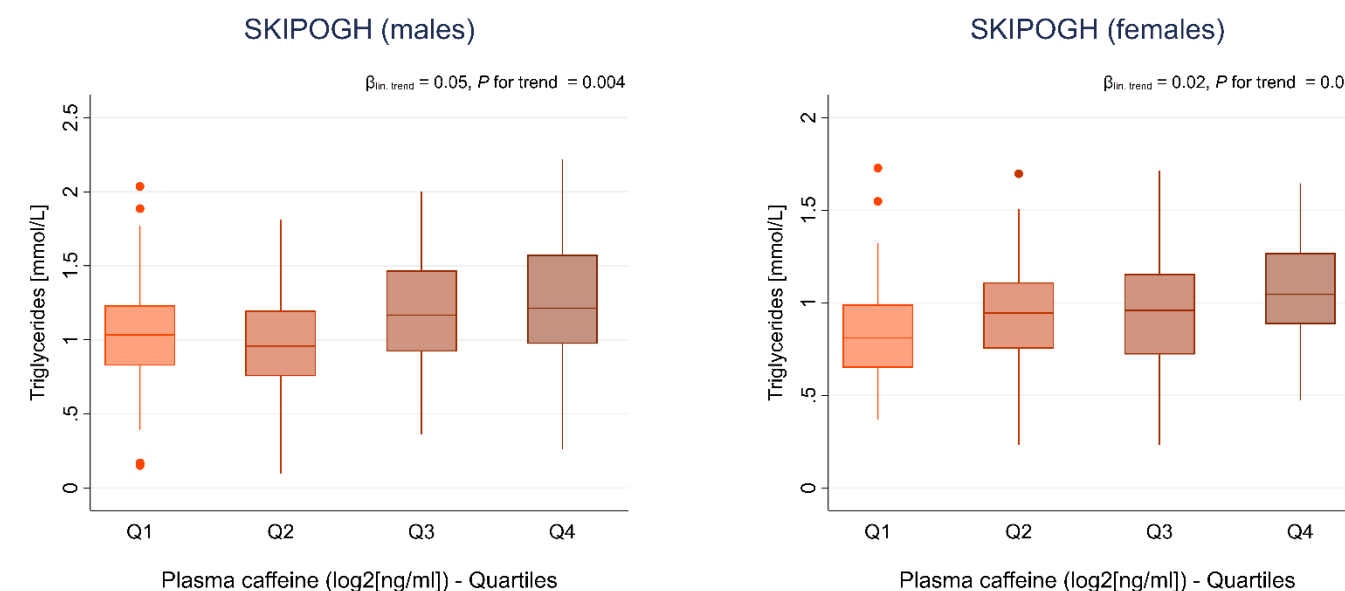
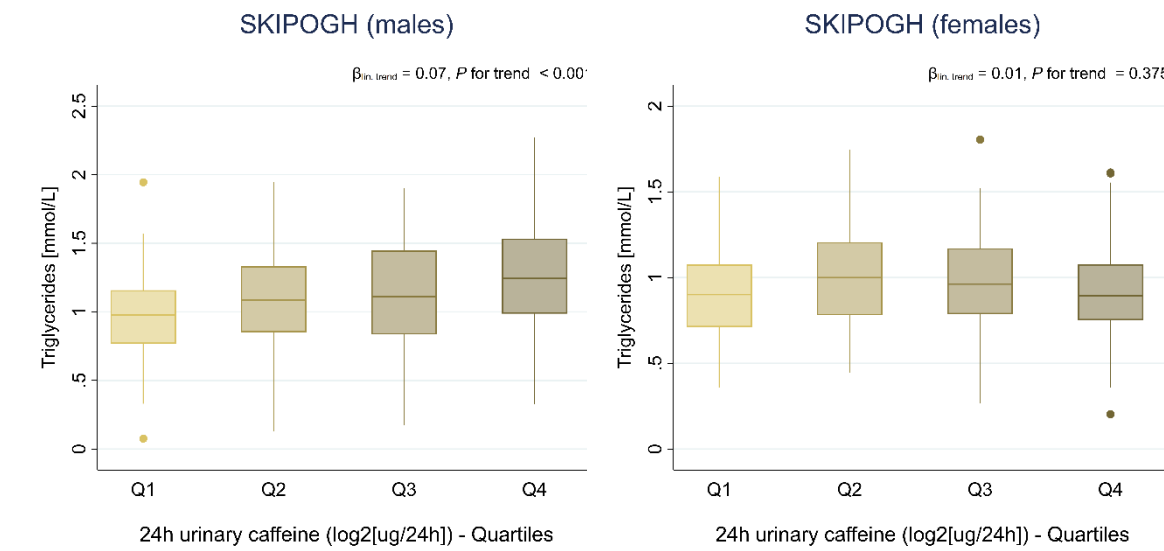


Fig. 3: Association between urinary caffeine and triglycerides in SKIPOGH



Other findings

In addition to the positive associations between methylxanthines with total, LDL cholesterol and triglycerides, we also found a positive association between urinary caffeine/theophylline and HDL cholesterol (also known as the “good cholesterol”) in SKIPOGH.

Conclusion

Plasma and urinary caffeine, paraxanthine, and theophylline were positively associated with a detrimental lipidic profile. The marginal increase in HDL cholesterol (SKIPOGH males) was not insufficient to counter the dyslipidemic effects. In conclusion, the positive association between caffeine intake with hyperlipidemia may mitigate the overall beneficial impact of caffeinated beverages on general mortality.

Methods

Populations: We used data from FLEMENGHO (Northern Belgium) and SKIPOGH (Switzerland) population-based studies, including 1987 and 990 participants respectively. **Methylxanthines:** Plasma levels (FLEMENGHO, SKIPOGH) and 24h urinary excretions (SKIPOGH) of caffeine, paraxanthine, theobromine, and theophylline. **Plasma lipids:** Total, LDL, HDL cholesterol and triglycerides. **Statistical analyses:** We applied mixed regression models to investigate sex-specific association between methylxanthines (predictor), and plasma lipids (outcomes).