

Investigating the regulation of post meal prouroguanylin levels in adults

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Uroguanylin (UGN) is a gut hormone involved in the regulation of electrolyte and fluid balance⁽¹⁾. More recent studies have proposed a role for UGN in the regulation of body weight^(2,3). UGN comprises of 16 amino acids and is secreted into circulation as a pro-hormone prouroguanylin (PU)⁽⁴⁾. Studies investigating the regulation of PU by food are limited, and we are not aware of any studies comparing circulating PU concentrations following meals rich in different macronutrients. Therefore, the current study aimed to compare PU concentrations following high carbohydrate, high protein and high-fat meals.

Seven adults, (4 females and 3 males) attended on separate study days following an overnight fast. On each occasion, they received a 716 kcal breakfast high in either carbohydrate, protein or fat, in random order. Blood samples were taken to measure plasma PU at fasting (0), 60, 120, and 180 minutes post meals. Plasma PU concentrations were measured by ELISA. At the same time points, and immediately after the meal, a visual analogue scale was used to measure the participant's feelings of hunger. Fasting versus post-meal PU concentrations for each breakfast was compared by ANOVA with repeated measures. A comparison of the PU concentrations between the 3 meals was made by two way ANOVA with repeated measures. Correlations between hunger levels and PU concentrations were analysed by non-parametric Spearman correlation.

The 716kcal high carbohydrate breakfast increased plasma PU concentrations, versus fasting at 120 minutes ($p = 0.007$), and 180 minutes ($p = 0.005$) (Figure 1). The high protein breakfast also increased PU concentrations versus fasting, at 120 minutes ($p = 0.003$), and 180 minutes ($p = 0.008$) (Figure 1). The high-fat breakfast increased PU concentrations, versus fasting, only at 180 minutes ($p = 0.021$) (Figure 1). However, there was no significant difference in PU concentrations measured when comparing the three breakfasts. There was also no significant correlation between PU concentrations and hunger levels.

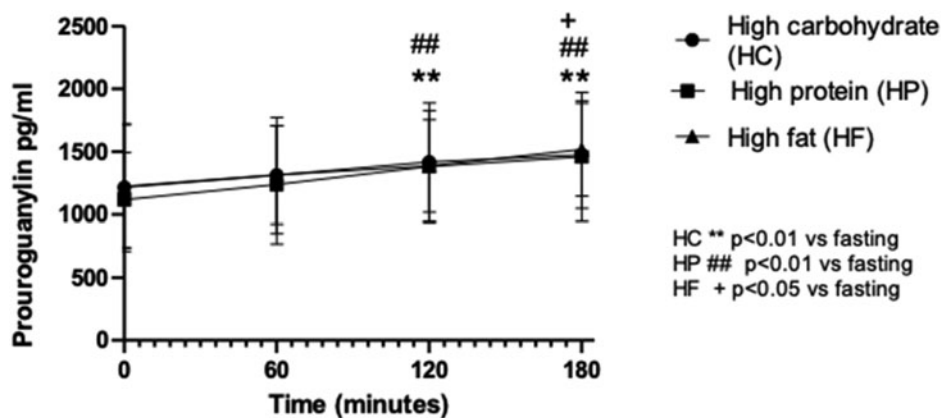


Fig. 1. Prouroguanylin concentrations

PU concentrations increase after meals and remain elevated for at least 3 hours. However, the increase is delayed only reaching significance at 2–3 hours, and PU concentrations do not correlate with feelings of hunger. The post-meal pattern of PU concentrations does not appear to differ substantially between meals high in different macronutrients.

I would like to express my special thanks of gratitude to my supervisor Dr Michael Patterson as well as our University of Roehampton, for giving me the chance to do this magnificent project.

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