



Nutrition Society Congress 2024, 2–5 July 2024

Associations of eating rate with postprandial glycaemic and insulin responses, gastric emptying, food and energy intake in older adults (aged ≥ 65 years)

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The population of older individuals worldwide is increasing and achieving a good quality of life in older age is vital⁽¹⁾. However, anorexia of ageing, a phenomenon often associated with delayed gastric emptying and reduced oral processing abilities⁽²⁾, can negatively affect older adults' health, quality of life and contribute to undernutrition⁽²⁾. In younger populations, slower gastric emptying has been associated with greater satiation and satiety⁽³⁾, and slower eating rates with reduced food intake and postprandial euglycemia⁽⁴⁾; however, little is known about these associations in the older adult population. This study investigated individual variations in food oral processing and their influence on postprandial glycaemic and insulin responses, gastric emptying, food and energy intake, in healthy adults, aged ≥ 65 years.

Participants attended a single visit day, after an overnight fast. A fixed-portion breakfast meal was provided and consumption was video-recorded for behavioural-annotation to quantify specific oral processing behaviours. Postprandial glucose and insulin responses were assessed via mixedcapillary fingerprick samples, and gastric emptying was measured with the ¹³C-octanoic acid breath test⁽⁵⁾. Three hours post breakfast, an *ad libitum* lunch was provided, where eating rate and food intake were measured. Food and drink intake for the rest of the day was assessed using a weighed food diary. Participants were classified as slower and faster eaters using a median of eating rate (g/min) of the breakfast meal, with an even number of males and females in each group. Repeated measures ANOVA and multiple regression analysis were used to explore the relationship between *ad libitum* intake and the parameters outlined above.

Eighty-eight older adults were recruited, 44 males and 44 females, with mean age 73.7 (± 5.3) years.

For the three hours postprandially, both glucose and insulin changed significantly over time ($F_{\text{glucose}} = 150.779$, $p < 0.001$ and $F_{\text{insulin}} = 111.645$, $p < 0.001$), but no differences observed between faster and slower eaters ($p > 0.05$). Similarly, gastric emptying did not differ between faster and slower eaters ($p > 0.05$). At the *ad libitum* meal, eating rate of the meal was the only significant predictor of energy intake ($r = 0.685$, $p < 0.001$), after accounting for age, gender and the postprandial (post breakfast) metabolic responses, gastric emptying and subjective satiety.

This study found no effect of eating rate on postprandial glycemia or gastric emptying in older adults, but showed significant association of eating rate during the meal on food and energy intake. These findings could provide implications in the design of texture-appropriate foods for this age group for future meal interventions.

References

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