Proceedings of the Nutrition Society (2011), **70 (OCE6)**, E389 doi:10.1017/S0029665111004745

Winter Meeting, 6–7 December 2011, 70th Anniversary: Body weight regulation – food, gut and brain signalling

Anorexia of Ageing is Associated with Increased Post-Prandial Secretion of the Anorectic Gastrointestinal Hormone Peptide YY

C. Moss[1], W. Dhillo[1], J. Bottin[1], M. Ghatei[1], G. Frost[1] and M. Hickson[2]
[1]*Department of Diabetes, Endocrinology and Metabolism, Imperial College London, London, W12 0NN, UK and*
[2]*Dietetic Department, Imperial College Healthcare NHS Trust, Charing Cross Hospital, Fulham Palace Road, London, W6 8RF, UK*

Under-nutrition is increasing in the ageing population; termed the anorexia of ageing(1), costing the NHS around £13 billion a year(2). Recent evidence suggests that this weight loss seen in ageing may be due to a reduction in appetite and energy intake. The mechanism of action is currently not known. It has recently been established that peptides released from the gastrointestinal tract have an influence on energy intake, for example PYY_{3-36} has been shown to potently reduce food intake(3). Some evidence suggests that there are alterations in gastrointestinal appetite hormones in ageing, but the data is limited and equivocal.

The aim of this study was to investigate if the reduction in energy intake in older healthy volunteers is the result of a reduction in appetite, caused by an alteration in the release of gastrointestinal appetite hormones. Subjective feelings of appetite, energy intake at an *ad libitum* meal and alterations in gastrointestinal appetite hormone release were investigated in 58 healthy volunteers ranging from the ages of 20 to 92 years.

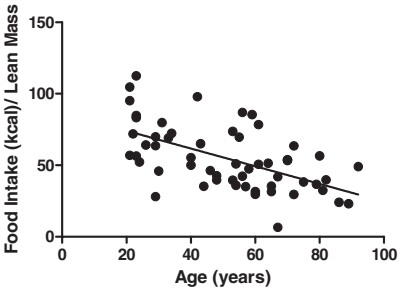

Fig. 1. Food intake at buffet meal controlled for lean body mass.

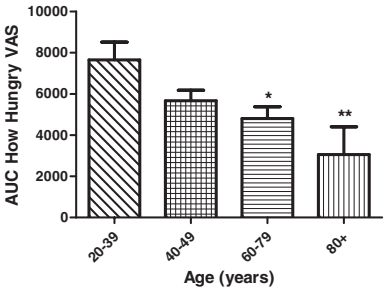

Fig. 2. Area under curve. How hungry do you feel VAS scores.

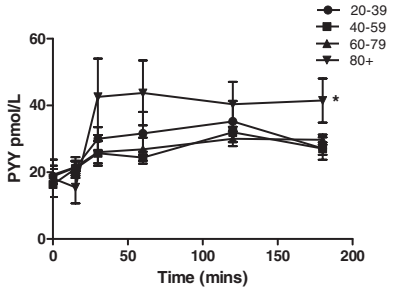

Fig. 3. PYY concentrations following test meal.

We found a significant reduction in energy intake with age whilst controlling for lean body mass, using linear regression ($p = <0.001$, $r^2 = 0.32$) (Figure 1). There were reductions in hunger, measured by visual analogue scales (VAS), between age ranges 20–39 and 60–79 years ($p = 0.027$) and 20–39 and 80+ years ($p = 0.007$) using ANOVA followed by Tukey's test (Figure 2). Significant reductions were also seen with ageing in VAS for how much can you eat ($p = <0.001$) and desire to eat ($p = <0.001$) between age ranges 20–39 and 80+ years. There was a significant increase in PYY concentrations following a test meal in female volunteers over the age of 80 years in comparison to the 20–39 age group ($p = 0.039$) using ANOVA followed by Tukey's test (Figure 3).

In summary, our data demonstrates that in ageing there is a reduction in energy intake in test meal conditions even when taking into account lean tissue mass, and there is an alteration in subjective feelings of appetite leading to reduced energy intake. This reduction in appetite and energy intake may be due to an increase in PYY concentrations following a meal. These findings have important therapeutic implications for treating patients with anorexia of ageing.

1. Morley JE & Silver AJ (1988) *Neurobiol Aging* **9**, 9–16.
2. Elia M & Stratton R (2005) *BAPEN*.
3. Batterham RL, Cohen MA & Ellis SM *et al.* (2003) *N Engl J Med* **349**, 941–948.