

afferents is unknown. Within the hypothalamus there is evidence to suggest that reactive oxygen species (ROS) production mediates the effect of leptin (Nat Med 2011;17:1121–7). Therefore we determined whether: (1) NOX mRNA and protein are expressed in vagal afferent neurones; and (2) we can mimic leptin effects in HFD conditions by inhibiting NADPH oxidase (NOX), the enzyme responsible for the synthesis of ROS.

The relative expression of NOX isoforms in vagal afferent neurons was NOX2 > NOX4 > DUOX2 > DUOX1 > NOX1 > NOX3. In addition, traced gastric vagal afferent neurones were NOX2 positive. Single fibre recordings of gastric vagal afferent tension and mucosal receptors were obtained from lean mice fed *ad libitum*. Leptin (1 nM) potentiated gastric vagal afferent mucosal receptor responses to mucosal stroking; an effect blocked by the NOX inhibitor apocynin (1 mM). Leptin had no effect on gastric vagal afferent tension receptors. However, in the presence of apocynin leptin reduced tension receptor responses to stretch.

In conclusion, NOX inhibition mimics the effect of leptin on gastric vagal afferent in HFD-induced obesity. Thus the switch in effect of leptin is likely due to disruption of leptin-NOX signalling pathways.

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Nutritional adequacy of diets for adolescents with overweight and obesity: Considerations for dietetic practice



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Background and aims: Adolescents have unique nutrient requirements due to rapid growth and development. High rates of obesity in adolescents require a variety of diet interventions to achieve weight loss under clinical supervision. The aim of this study is to examine the nutritional adequacy of energy restricted diets for adolescents.

Methods: Three popular diets were modelled for 7 days and assessed by comparing the nutrient profile to the Australian Nutrient Reference Values. Three diets were: [1] a standard energy restricted diet based on current dietary guidelines; [2] a hypocaloric diet aimed at increasing protein and improving carbohydrate quality; and [3] a modified alternate day fasting diet.

Results: Initial modelling revealed limiting nutrients (i.e. not meeting the recommended intakes) across the diets. Subsequent modelling was required to achieve nutritional adequacy for all three diets. The dietary guidelines diet design met most nutrient targets except essential fatty acids prior to subsequent modelling, however this diet also provided the highest energy (8.8 MJ vs 8.0 MJ and 6.8 MJ for the hypocaloric and modified alternate day fasting diet, respectively).

Conclusions: Energy restricted diets need careful consideration to meet nutritional requirements of adolescents. A variety of eating patterns can be adapted to achieve nutritional adequacy and energy restriction, however health practitioners need to consider adequacy when prescribing diet interventions for weight loss during adolescence.

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