NSA Concurrent Oral Session 2: Energy and Metabolism

Physiological validation of the concept of glycemic load in mixed meals over 10 hours in overweight females

FS Atkinson[1], JMR McMillan-Price[1], P Petocz[2], JC Brand-Miller[1]

[1]*Human Nutrition Unit, University of Sydney, NSW 2006*
[2]*Department of Mathematical Sciences, University of Technology, Sydney, NSW 2007*

Background - In the science of weight loss, the value of diets with a low glycemic index (GI) or glycemic load (GL) is controversial. GL remains an unproven concept without evidence that the calculated GL predicts blood glucose and insulin responses to mixed meals.

Objective - To compare day-long glucose and insulin responses to four isoenergetic reduced fat diets, varying in GL, carbohydrate and protein content.

Design - A randomised, four-intervention, crossover study was conducted in 11 overweight or obese females (age: 26.5 ± 4.4 yr, BMI: 30.0 ± 4.3 kg/m^2). The four diets were: a conventional low-fat high-GI diet (55% CHO, 15% protein, 30% fat, GL 116); a low-GI diet (55% CHO, 15% protein, 30% fat, GL 65); a high protein-high GI diet (45% CHO, 25% protein, 30% fat, GL 84); and high protein-low GI diet (45% CHO, 25%-protein, 30% fat, GL 43). Subjects consumed 3 mixed meals and 1 snack at intervals over 10 h. Fingerprick capillary blood samples (n = 14) were collected at 30-60 min intervals and analysed for glucose and insulin.

Outcomes - Incremental area under the curve (AUC, mean ± SE) was calculated (table).

GL	Glucose AUC (mM•min)	Insulin AUC (pM•min)
43	196 ± 30	4.4 ± 0.8
65	223 ± 45	6.4 ± 1.0
84	230 ± 35	5.3 ± 0.8
116	315 ± 36	7.9 ± 1.2

Using regression analysis, GL was significantly correlated with glucose AUC (r = 0.35, P = 0.022) and insulin AUC (r = 0.35, P = 0.021). Varying the GI had a stronger effect (P = 0.026) on glucose response than varying the carbohydrate (P = 0.046) but only carbohydrate amount had a significant effect on insulin response (P = 0.002).

Conclusions - Dietary GL has a predictable effect on day-long glucose and insulin responses in overweight and obese females. Diets with lower GL may be helpful for weight control.

Ethnicity and diabetes control

L Sanderson
Institute of Food Nutrition and Human Health, Massey University, Auckland, New Zealand

Background Type 2 diabetes mellitus has reached epidemic proportions in New Zealand. There has also been a dramatic rise in numbers from different ethnic groups attending the Auckland Diabetes Centre.

Objective To investigate socio-cultural and psychological issues which may be barriers to lifestyle and dietary modification for optimal diabetes control in women from 5 ethnic groups attending the Auckland Diabetes Centre.

Design A total of 232 women took part in this study: Maori (44), Pacific Island (53), Chinese (34), Indian (48), and European (53). All answered a questionnaire designed to obtain views on diabetes, how it affects lifestyle and perceptions of food and health at a routine clinic visit. Demographic, co morbidity and socioeconomic data were also collected. Differences across groups were compared using ANOVA.

Outcomes The mean age of the group was 56 years and the median duration of diabetes was 6 years (interquartile range 2 to 11). 192 (83%) of the study participants were taking some form of diabetic medication. Significant differences were found across the ethnic groups in age (P=0.033), HbA1c (P=0.032) and Body Mass Index (P<0.001). There were strong differences in attitude across the groups especially in terms of how they are treated (P=0.011) and frustration (P=0.007). Some ethnic groups felt having diabetes cost them more for food (P=0.006) and stopped them from going out to eat with friends (P=0.016). Nutrition knowledge varied across groups (P=0.02), as did the importance placed on physical fitness (P=0.02). Future health was important to all ethnic groups.

Conclusions This study is one of the first in New Zealand to look at socio-cultural and psychological issues across the 5 ethnic groups with the highest prevalence of Type 2 diabetes. Significant differences found across the ethnic groups suggest that a more holistic approach and a wider knowledge of cultural and physiological issues are required for successful diabetes education. With only 8% of New Zealand's practising dietitians coming from minority ethnic groups effort needs to be placed on making sure all health professionals are cognizant of individuals health beliefs and cultural practices.