The preview study: Metabolic outcomes in overweight, prediabetic individuals after an 8-week low calorie diet

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Background/Aims: The PREVIEW intervention study (www.previewstudy.com) is the largest study aiming to prevent T2D among pre-diabetic individuals with a combination of diet, exercise and behaviour modification. Prior to weight maintenance, participants follow a ‘low-calorie diet’ (LCD).

Methods: Participants received LCD (810 kcal daily) for 8 weeks (Canbridge Weight Plan®). Those who achieved ≥8% WL were analysed. Two-sided t-tests and linear regression.

Results: The weight loss phase was successfully completed by 1,842 (79%) participants. At baseline, mean ± SD age was 51.6 ± 11.6 years, BMI 35.3 ± 6.5 kg/m², fasting plasma glucose (FPG) 6.2 ± 0.7 mmol/L, and fasting serum insulin (FSI) 13.4 ± 2.2 mU/L. Average WL was 10.6 ± 4.0 kg, with men losing 12.7 ± 4.2 kg and women 9.6 ± 3.4 kg (gender difference, p < 0.001). FPG decreased by 0.57 ± 0.7 mmol/L in men and by 0.37 ± 0.6 mmol/L in women (p < 0.001; FSI decreased by 5.8 ± 7.4 mU/L in men and by 3.8 ± 5.4 mU/L in women (p < 0.001). The linear model showed an association of the % weight loss as well as gender on FPG and FSI changes.

Conclusions: LCD intervention resulted in marked decreases in body weight, FPG and FSI among prediabetic subjects.

References: European Union 7th Framework Programme; NHMRC-EU Collaborative Grant; The NZ Health Research Council

The same findings were observed for postprandial blood glucose and insulin. Statistical differences were assessed by one-way ANOVA.

Results: The high A1C diet exacerbated albuminuria in db/db mice (mean ± SD, db/db HAGE: 874.4 ± 154.8 vs. db/db LAGE: 536.2 ± 96.5 μg/mL; p < 0.05), and RS attenuated this A1C-induced increase (db/db HAGE: 874.4 ± 154.8 vs. db/db HAGE+RS: 515.5 ± 71.9 μg/mL; p < 0.05). db/db mice had greater gut permeability compared to db/h mice (db/db LAGE: 2.38 ± 0.32 vs. db/h LAGE: 1.05 ± 0.11 μg/mL; p < 0.01). db/db HAGE-fed mice trended towards increased gut permeability (db/db HAGE: 3.43 ± 0.43 vs. db/db HAGE: 2.38 ± 0.32 μg/mL; p = 0.06), an effect not observed in RS-fed db/db mice.

Conclusions: Heat-treated diets led to increased intestinal permeability and worsening albuminuria in db/db mice. RS was protective against high A1C-induced albuminuria in db/db mice. These preliminary studies support the notion that dietary AGES contribute to renal disease via alterations in gut homeostasis.