

Reinforced healthy living advice over six years does not delay progression to diabetes

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Background and Aims: Dysglycaemia is a risk factor for cardiovascular disease and type 2 diabetes. We aimed to determine whether healthy living advice could prevent or delay progression to diabetes in subjects thought to be at risk with two successive fasting plasma glucose (FPG) 5.5 to 7.7 mmol/L.

Materials and Methods: 188 subjects were randomised in a prospective study 50% to reinforced and 50% to basic healthy living advice. The reinforced group were advised to reduce weight if body mass index $> 22 \text{ kg/m}^2$, adopt a reduced fat, high unrefined carbohydrate diet and increase physical activity until exercising 3 to 4 times a week. Self-reported dietary intake was assessed by 3 day food diaries and fitness by maximal oxygen uptake ($\text{VO}_2 \text{ max}$) during a submaximal bicycle ergometer test. Simultaneously, subjects were randomised in a double-blind factorial design, 50% to gliclazide therapy and 50% to a control group. Mean (SD) age was 50 (9) years, weight 81.7 (14.5) kg, median (IQR) FPG 5.9 (5.6 to 6.3) mmol/L, two hour OGTT plasma glucose (2HPG) 9.0 (6.8 to 11.0) mmol/L. 7% had FPG ≥ 7.0 mmol/L and 45% were male.

Results: Over six years the net change in weight tended to be lower in the reinforced group (1.5 kg, $p = 0.087$), net $\text{VO}_2 \text{ max}$ increased by 9.5% ($p = 0.028$) and self reported fat intake reduced by net 7% ($p = 0.026$). In the reinforced compared to the basic advice group there was no significant difference in the proportion of subjects who became overtly diabetic with two successive FPG values > 10 mmol/L (8.6% *vs* 5.3%), those with FPG values ≥ 7.8 mmol/L (19% *vs* 16%) or the proportion undergoing an OGTT at 6 years ($n = 109$) who were diabetic (58% *vs* 44%, WHO 1985 criteria). No significant net differences were seen in FPG, HbA_{1c} , fructosamine, 2HPG, lipid profiles, HOMA derived beta cell function or insulin sensitivity.

Conclusion: Six years of conventional reinforced healthy living advice resulted in small but significant changes in self reported fat intake and physical fitness but did not delay progression to diabetes in these self referred at risk subjects with median FPG 5.9 mmol/L.