

Management & prevention of type 2 diabetes



Should we offer very-low-calorie diets to people who are highly motivated to lose weight regardless of diabetes duration?

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This is a further paper from Roy Taylor's group investigating the use of a very-low-calorie diet in the management of type 2 diabetes. In this study, 15 people with type 2 diabetes of less than 4 years' duration and 15 people with type 2 diabetes of more than 8 years' duration completed an 8-week very-low-calorie diet. The study participants were recruited by advertisement and were very highly motivated to succeed in losing weight.

The diet consisted of a meal replacement liquid diet formula plus 240 g of non-starchy vegetables per day; therefore, the total energy intake was maintained at 624–700 kcal per day. Participants were also encouraged to drink at least 2 litres of calorie-free drinks per day and to maintain their usual level of physical activity. One-to-one support was provided weekly by telephone, e-mail, text or face-to-face contact.

After 8 weeks, the mean weight loss was similar between the two groups (14.8% in the short-duration group and 14.4% in the long-duration group; $P=0.662$), and decreases in BMI were also similar: from around 34 to 29 kg/m² in both groups. Fasting plasma glucose significantly decreased from 9.6 to 5.8 mmol/L in the short-duration group and from 13.4 to 8.4 mmol/L in the long-duration group. In the short-duration group, 87% achieved non-diabetic fasting glucose levels at week 8 compared with 50% in the long-duration

group. HbA_{1c} dropped significantly from 55 to 44 mmol/mol (7.2 to 6.1%) in the short-duration group and from 70 to 64 mmol/mol (8.6% to 8%) in the long-duration group, but this was not a statistically significant decrease. Systolic blood pressure improved in both groups from 144±5 to 125±5 mmHg ($P=0.003$) in the short-duration group and from 160±7 to 133±6 mmHg ($P<0.001$) in the long-duration group. Total cholesterol significantly improved from approximately 4.7 to 3.7 mmol/L in both groups.

Participants in both groups described an improvement in general well being, increased mobility and better sleep quality, as well as reductions in blood pressure (equivalent to improvements seen using two anti-hypertensive agents) and cholesterol (equivalent to taking a statin).

The authors conclude that even in people who have had type 2 diabetes for over 8 years, a therapeutic trial of a very-low-calorie diet may be undertaken with a 50% chance of achieving non-diabetic fasting glucose levels, as well as having positive benefits on cholesterol and blood pressure. This has significant implications for clinical practice. Should we now be offering a very-low-calorie diet as a management option to people with both short and long duration of type 2 diabetes who are highly motivated to lose weight? I think we should. ■

Diabet Med

Very-low-calorie diet for people with diabetes duration over 8 years

Readability ////

Applicability to practice ////

WOW! Factor ////

1 The aim of the study was to establish whether a very-low-calorie diet is effective in improving glycaemic control in people who have had diabetes for a long duration (defined as over 8 years).

2 The 8-week diet was followed by 15 people with T2D for less than 4 years, and 14 people with T2D for more than 8 years.

3 All T2D medication was stopped prior to the study and participants had to achieve weight loss targets of 3.8% and 9.3% body weight at weeks 1 and 4 respectively to remain in the study.

4 The two groups were well-matched at baseline for weight and BMI, and they achieved a similar weight loss of approximately 14% ($P=0.662$ for the difference). Both groups achieved a similar and significant decrease in BMI.

5 The short- and long-duration groups both had significant decreases in fasting plasma glucose.

6 The responders were defined as achieving a fasting plasma glucose of <7 mmol/L at week 8 of the diet. Of the 29 participants, those who responded tended to be younger, have a shorter diabetes duration and lower baseline fasting glucose and required less treatment compared to non-responders.

7 Blood pressure, total cholesterol and LDL-cholesterol improved markedly and to a similar extent in both groups. There was no change in HDL-cholesterol in both groups.

Steven S, Taylor R (2015) Restoring normoglycaemia by use of a very low calorie diet in long- and short-duration type 2 diabetes. *Diabet Med* 12 Feb [Epub ahead of print]

Diabet Med

Preventable hospitalisation for people with T2D

Readability ✓✓✓✓
 Applicability to practice ✓✓
 WOW! Factor ✓✓✓✓

- 1 A multidisciplinary, community-based, integrated primary–secondary care diabetes service was implemented in Brisbane, Australia, and this study evaluated whether this service could reduce preventable hospitalisations compared to usual care.
- 2 The new service allowed the endocrinologist to see more patients because advanced-skilled general practitioners could treat the patient once they had been discharged from secondary care.
- 3 At baseline, the intervention group were younger, more likely to be female, had a lower level of education, and a significantly higher HbA_{1c}. The intervention group were hospitalised for shorter periods of time than the patients in the usual care group.
- 4 After 24 months, the people in the intervention group were nearly half as likely to be hospitalised for a potentially preventable diabetes-related principal diagnosis compared with the usual care group (incidence rate ratio, 0.53 [95% confidence interval, 0.29–0.96; *P*=0.04]). This result remained similar after adjusting for baseline factors (*P*=0.05).
- 5 People in the intervention group had significantly higher non-diabetes-related hospitalisations than patients in the usual care group.
- 6 The authors note a future study would be to conduct a more robust randomised controlled trial, and they conclude that integrated models of care can reduce hospitalisations and help attempts to curtail increasing demand on finite health services.

Zhang J, Donald M, Baxter KA et al (2015) Impact of an integrated model of care on potentially preventable hospitalizations for people with type 2 diabetes mellitus. *Diabet Med* 23 Jan [Epub ahead of print]

Diabetologia

Glucose, BP and cholesterol levels: Relationships to clinical outcomes

Readability ✓✓✓
 Applicability to practice ✓✓✓✓
 WOW! Factor ✓✓✓✓

- 1 The aim of this analysis was to describe the shape of observed relationships between risk factor levels and clinically important outcomes in T2D: HbA_{1c}, total cholesterol, systolic blood pressure (BP) and diastolic BP.
- 2 Using retrospective longitudinal data from the Clinical Practice Research Datalink (2006–2012), 246 544 adults with T2D were included and hazard ratios were calculated.
- 3 U-shaped relationships were observed between all-cause mortality and the mean levels of the four biometric risk factors.
- 4 Lowest risks were associated with HbA_{1c} 7.25–7.75% (56–61 mmol/mol), total cholesterol 3.5–4.5 mmol/L, systolic BP 135–145 mmHg and diastolic BP 82.5–87.5 mmHg.
- 5 Coronary and stroke mortality related to the four risk factors in a positive, curvilinear way, except for systolic BP, which related to deaths in a U-shape. Macrovascular events showed a positive and curvilinear relationship with HbA_{1c} but a U-shaped relationship with total cholesterol and systolic BP. Microvascular events related to the four risk factors in a curvilinear way: positive for HbA_{1c} and systolic BP but negative for cholesterol and diastolic BP.
- 6 Several relationships were identified, which support the notion that normalisation of glucose and BP can lead to poorer outcomes. Thus, target ranges might be more appropriate than target levels.

Kontopantelis E, Springate DA, Reeves D et al (2015) Glucose, blood pressure and cholesterol levels and their relationships to clinical outcomes in type 2 diabetes: a retrospective cohort study. *Diabetologia* 58: 505–18

Diabetes Res Clin Pract

Are there patient characteristics associated with failure to receive indicated care?

Readability ✓✓✓✓
 Applicability to practice ✓✓✓✓
 WOW! Factor ✓✓✓✓

- 1 The authors determined whether there is an association between patient characteristics and a failure to receive care for T2D.
- 2 Participants aged 50 years and over and with T2D were selected from the English Longitudinal Study of Ageing.
- 3 Four diabetes quality indicators (QIs) were investigated. HbA_{1c}, proteinuria and foot examinations were assessed as a care bundle (*n*=907), and the fourth QI was whether participants with cardiac risk factors were offered angiotensin-converting-enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs; *n*=759).
- 4 A third of participants did not receive all annual checks in the care bundle in the periods 2008–2009 and 2010–2011. Failure to receive the care bundle was associated with lower diabetes self-management knowledge (odds ratio [OR], 2.05), poorer cognitive performance or having received incomplete care previously.
- 5 In both study periods, nearly half of those eligible for ACE inhibitors or ARBs were not offered them. Characteristics that predicted failure to receive this QI included being single, having low health literacy and having received incomplete care previously (OR, 6.94). Increasing age or BMI were associated with lower odds of failing to receive this aspect of care.
- 6 This study provides insight into the individuals who would benefit from a more targeted care approach.

Mounce LT, Steel N, Hardcastle AC et al (2015) Patient characteristics predicting failure to receive indicated care for type 2 diabetes. *Diabetes Res Clin Pract* 107: 247–58

“Blood pressure, total cholesterol and LDL-cholesterol improved markedly and to a similar extent in short- and long-duration T2D after following the very-low-calorie diet for 8 weeks.”