

Back to basics – getting the nutritional messages right!



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Diet is considered a mainstay, or certainly one of the central foundations, of successful diabetes self-management. But which diet? For when? And for whom? Everyone it seems has a view about healthy eating, and the messages we receive are often filtered by our

traditions, ethnicity, cultural norms or the fads and fashions that hold sway around us. We face a constant barrage of advertising and advice telling us the essential components of a healthy diet, the integral ingredients of tasty, enjoyable tuck and the necessary nutritional components of a balanced meal. Unfortunately the messages are often significantly different if not mutually exclusive.

Patients with diabetes should fair better. Most have access to expert professional advice. That advice is informed by recommendations from leading diabetes care organisations (the American Diabetes Association, the European Association for the Study of Diabetes, Diabetes UK, etc.) and there seems, if not total agreement, a broad consensus on the type of advice given... but how is this advice interpreted by patients with diabetes? What goes into their supermarket trolleys and what happens in their kitchens? This interesting study asks the key question from the patient's perspective – armed with the knowledge that they have diabetes – what

do people with diabetes eat?

In this prospective study the eating habits of a small sample (n=67) of self-declared people with diabetes were compared with a large sample of those without (n=4658). The sampling strategy itself rings alarm bells and suggests problems with either identification of patients with diabetes compared with those without, or some other care ascertainment bias, as one might expect a prevalence of diabetes of around 2%, suggesting that the diabetes group is highly selected in some way. Indeed the group members were concerned about their health and were aware of healthcare issues. But the messages which emerge are nonetheless interesting.

Patients with diabetes who declared it do seem to have altered their nutritional behaviour. Both men and women reduce their carbohydrate intake related to the diagnosis of diabetes rather than BMI. Men increase their protein intake. Only the women reduce their lipid and total energy intakes. The carbohydrate intakes were unbalanced and there was excess protein intake. Micronutrient intakes were similar to those of people without diabetes and often too low. Patients with diabetes are trying to modify their diet but are often doing so inappropriately. Diet is a key component of diabetes prevention and the mainstay of successful diabetes management. We need to find better ways of communicating the key messages, better education and training in this key life skill, and better audit and evaluation in routine clinical practice.

DIABETES & METABOLISM

Nutritional behaviour in the SU.VI.MAX study

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓

1 The EASD recommends that of total caloric intake for diabetes patients, 10–20% should be from proteins, <10% from polyunsaturated fats and ~10% from saturated fatty acids, and the remaining 60–70% should come from a protein/carbohydrate/monounsaturated fatty acids combination.

2 This study used a sub-population of the SU.VI.MAX study and reported on its dietary habits. The sub-population consisted of self-declared diabetes patients; therefore no distinction is made between types 1 and 2 in this study (although the age range, 45–60 years, indicates more type 2 than type 1).

3 The participants kept a diary of dietary intake for 24 hours, every 2 months over a year; this negated any seasonal bias to nutrient intake. Only those who kept a diary for a minimum of five records were included in the final analysis.

4 The results show that women and men with diabetes consumed significantly less sweetened products, starchy foods and dairy produce, and significantly more fruits and vegetables, margarine and meat compared to those without the condition.

5 The study concludes that although diabetes patients alter their diets when they become aware of their condition, the change in nutritional intake is not necessarily a healthy one. The investigators conclude that the growing population of diabetes sufferers would benefit from a few good sources of health information rather than the plethora they are exposed to now.

Gauthier-Chelle K, Mennen L, Arnault N et al (2004) Comparison of the diet of self-declared diabetics with non-diabetic patients in the SU.VI.MAX study: Did the diabetics modify their nutritional behaviour? *Diabetes & Metabolism* 30(6): 535–42

CHEST

Type 2 in coronary bypass patients

Readability	✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓

1 Woods et al analysed data from hospitalised patients undergoing coronary artery bypass graft surgery for operative mortality, as well as 12 other morbidity outcomes. Of 6711 patients in the study, 2178 were diabetes patients and 4533 were not.

2 The study concluded that type 2 patients had a significantly higher total operative mortality rate than the control group ($P=0.002$), even after controlling for multiple variables.

3 Of the 12 secondary morbidity outcomes (including length of stay, and neurologic and renal complications) none were found significantly different between the two groups.

Woods SE, Smith M, Sohail S et al (2004) The influence of type 2 diabetes mellitus in patients undergoing coronary artery bypass graft surgery. *Chest* 126(6): 1789–95

Type 2 diabetes

AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY

Preconception counselling for women with diabetes

Readability	✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓✓

- 1 This study examined the degree of preconception counselling for women with diabetes.
- 2 The age range of all questioned was 18–45 years. A total of 236 women were asked if they had received counselling on glycaemic control preconception and 227 women were asked if family planning was offered until glucose control was achieved.
- 3 Of the former group 52% recalled being given advice and of the latter group 37% received at least some family planning advice.
- 4 Rates of preconception counselling were found to be disappointingly low and was associated with younger women and those with lower BMI values.

Kim C, Ferrara A, McEwen LN et al (2005) Preconception care in managed care: The translating research into action for diabetes study. *American Journal of Obstetrics and Gynecology* **192**(1): 227–32

THE JOURNAL OF CLINICAL ENDOCRINOLOGY & METABOLISM

Ethnic origin and family history of diabetes and PCOS

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

- 1 In women with PCOS, impaired glucose tolerance and type 2 diabetes are common. This group studied the effects of ethnic origin and family history on the metabolic status of women with polycystic ovary syndrome (PCOS).
- 2 Women with PCOS from an African, Hispanic or South Asian background were found to have higher levels of blood glucose and higher levels of insulin resistance; these results were significant even after correction for family history.
- 3 Family history was also found to be associated with higher glucose levels and higher insulin resistance in women with PCOS. Both sets of results confirm previously published data.

Ehrmann DA, Kasza K, Azziz R et al (2005) Effects of race and family history of type 2 diabetes on metabolic status of women with polycystic ovary syndrome. *The Journal of Clinical Endocrinology & Metabolism* **90**(1): 66–71

METABOLISM CLINICAL AND EXPERIMENTAL

Effect of repaglinide and gliclazide on glucose production

Readability	✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓✓

- 1 A variable rate tracer method was used to examine the effect of repaglinide and gliclazide upon endogenous glucose production (EGP). All measurements were carried out after a standardised meal, and basal EGP levels were similar for all study participants. Participants were split into two

groups: those taking repaglinide and those on gliclazide.

- 2 After the standardised meal, EGP levels fell quickly. The greater suppression of EGP was reached in the group taking repaglinide, although the final EGP levels were similar between groups at the end of the tracing.

- 3 No clinical benefits were discovered with one treatment over the other when assessed for effect of EGP.

- 4 The investigators concluded that although both treatments offer a lowering of EGP postprandially, their effects fall far short of correcting endocrine and metabolic abnormalities in patients with type 2 diabetes.

Singhal P, Caumo A, Cobelli C et al (2005) Effect of repaglinide and gliclazide on postprandial control of endogenous glucose production. *Metabolism: Clinical and Experimental* **54**(1): 79–84

‘Successful glycaemic control is more important than choice of pharmacotherapy when controlling gestational diabetes mellitus outcomes.’

AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY

Effect of insulin and glyburide on GDM

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 This was a secondary analysis of a randomised group of 404 women from a previous study to evaluate the effect of glyburide (In UK: glibenclamide) upon pregnancy outcomes.

2 Gestational diabetes mellitus (GDM) severity was determined by fasting plasma glucose using oral glucose tolerance tests.

3 The investigators discovered that, compared to insulin, glyburide has no extra effect on GDM, concluding that successful glycaemic control is more important than choice of pharmacotherapy when controlling GDM outcomes.

Langer O, Yogev Y, Xenakis EM et al (2005) Insulin and glyburide therapy: Dosage, severity level of gestational diabetes, and pregnancy outcome. *American Journal of Obstetrics and Gynecology* **192**(1): 134–9

THE JOURNAL OF CLINICAL ENDOCRINOLOGY & METABOLISM

Low-carb/high-fat diet improves glucoregulation

Readability	✓✓✓
Applicability to practice	✓✓✓
WOW! factor	✓✓✓

1 This study looked at the effect of high-carbohydrate (89 %) and high-fat (89 %) diets on fasting glucose metabolism and insulin sensitivity.

2 Glucose production was found to be higher in the high-carbohydrate diet due to a higher glycogen metabolism rate. Free fatty acids were also significantly suppressed in both diets.

3 The investigators concluded that short-term carbohydrate-to-fat ratios affect glucose metabolism through glycogenolysis in patients with type 2 diabetes but has no effect on insulin sensitivity.

Allick G, Bisschop PH, Ackermans MT et al (2004) A low-carbohydrate/high-fat diet improves glucoregulation in type 2 diabetes mellitus by reducing postabsorptive glycogenolysis. *The Journal of Clinical Endocrinology & Metabolism* **89**(12): 6193–7

THE JOURNAL OF CLINICAL ENDOCRINOLOGY & METABOLISM

Efficacy of pioglitazone versus metformin

Readability	✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓

1 Schernthaner et al stipulated that pioglitazone could be used as primary treatment for patients with type 2 diabetes as it increases insulin sensitivity of peripheral tissues.

2 The study included 1194 participants not yet initiated to any treatment regimens for type 2 diabetes. Two randomised groups were formed, each with 597 participants; one group was initiated to pioglitazone, the other to metformin. Eighty-four per cent of each group successfully completed the trial.

3 From baseline, both treatments decreased triglyceride and free fatty acid levels, the reduction with pioglitazone was significantly more than metformin. HDL-cholesterol was raised under both treatments, significantly more with pioglitazone. LDL-cholesterol was raised by pioglitazone and reduced by metformin, both differences being significant. Pioglitazone and metformin lowered total cholesterol:HDL-cholesterol ratio by similar amounts (non-significant difference). The urinary albumin/creatinine ratio was also significantly reduced by pioglitazone.

4 The study concluded that although HbA_{1c} levels are similarly lowered with both treatments individually, but there are specific differences which may influence prescribers on an individual patient level.

Schernthaner G, Matthews DR, Charbonnel B et al (2004) Efficacy and safety of pioglitazone versus metformin in patients with type 2 diabetes mellitus: A double-blind, randomized trial. *The Journal of Clinical Endocrinology & Metabolism* **89**(12): 6068–76

DIABETIC MEDICINE

Rosiglitazone enhances myocardial glucose uptake

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 Peroxisome proliferator-activated receptor γ (PPAR γ) has recently been described as a regulator of glucose metabolism (as well as cell proliferation, lipid metabolism and inflammatory responses).

2 This study included 44 patients randomised to one of three treatment regimens for a 26-week period – rosiglitazone (a PPAR γ agonist), metformin or placebo (the latter two being controls). [¹⁸F]-2-fluoro-2-deoxy-D-glucose ([¹⁸F]FDG) was injected intravenously and traced using positron emission tomography (PET) to determine myocardial glucose uptake.

3 PET at week 26 (conducted during euglycaemic hyperinsulinaemia) indicated that rosiglitazone treatment increased insulin-stimulated myocardial glucose uptake by 38 % ($P=0.004$) and whole body glucose uptake by 36 % ($P=0.01$) compared to baseline, which was similar in all three groups. Metformin and placebo showed no significant changes.

4 Neither rosiglitazone nor metformin treatment had any effect on free fatty acid (FFA) levels, although the FFA levels were suppressed by 47 % in the rosiglitazone group ($P=0.02$).

5 In conclusion rosiglitazone was shown to significantly increase insulin-stimulated myocardial and whole body glucose uptake compared to metformin in patients with type 2 diabetes. The investigators also conclude that this could be due to the effect of rosiglitazone on the suppression of serum FFAs.

Hällsten K, Virtanen KA, Lönnqvist F et al (2004) Enhancement of insulin-stimulated myocardial glucose uptake in patients with type 2 diabetes treated with rosiglitazone. *Diabetic Medicine* **21**(12): 1280–7

‘Rosiglitazone was shown to significantly increase insulin-stimulated myocardial and whole body glucose uptake’