Highs and Lows of Carbohydrate and Calories for Type 2 Diabetes!

A journey through my 'scientific incompetence' or Evidence Informed Practice depending on perspective

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Overview of Session

• Consideration of the evidence for low carbohydrate diets and very low energy diets in the management of type 2 diabetes

• Media debate about diets, what’s the good, the bad and the downright rude!!

• A few other bits about the proposed changes to the BDA council

• Any questions
What Dietary Approaches to You Use with People with Type 2 Diabetes?

Talk in One Slide

- Low carbohydrate diets can work
- Very low energy diets can induce remission in type 2 diabetes
- Low fat diets can also work, as can Mediterranean and vegan diets
- Let’s stop playing my diet is better than yours
- Focus on helping people make decisions about the food they eat
- Individualize dietary advice to maximize long term success based on the foods that are enjoyed by the people eating them

Prof. R Taylor’s – Twin Cycle Hypothesis
Why has there been all this focus on carbohydrate?

- It’s topical (it has been for a while)
- It’s controversial
- It’s an easy target
- It’s known excess carbohydrate if not stored as glycogen is converted by the liver to triglycerides
- Final point ‘foie gras’
  (In simplification as metabolically different, HLD increases, not LDL, suggested)

Suggestion of a link between sugar/fructose and NAFLD

Pause...

Do we actually advise people living with type 2 diabetes to eat more? What meal patterns? What at each meal?

Do we actually tell them to eat more carbohydrate

What could this mean?

- Potentially it explains a lot:
  - Could explain why weight loss works? (Owen, 2008)
  - Could explain why even after weight regain following weight loss glycaemic control/insulin resistance can maintain improvements (Owen et al., 2010)

- Until very recently a little more controversial perhaps:
  - Explain short term data for Very Low Energy Diets and Carbohydrate restricted programmes? (Gentile et al., 2011; and et al., 2012; Mannion et al., 2012)

  Now not controversial with the release of DIRECT data, verge of becoming mainstream?
The DiRECT Study

- Lean et al. 2017 The Lancet
- Primary outcome based on >15kg weight loss, this was derived from bariatric surgery and data from preliminary work and Look AHEAD
- 49 primary care practices recruiting a total of 306 individuals in a cluster randomisation
- 20-65 years who had been diagnosed with type 2 diabetes within the past 6 years BMI 27-45 kg/m2, and not using insulin.
- Intervention comprised withdrawal of antidiabetic and antihypertensive drugs, total diet replacement (825-853 kcal/day formula diet for 3-5 months), stepped food reintroduction (2-8 weeks), and structured support for long-term weight loss maintenance.

Primary outcomes of DiRECT

- Fig A shows how many lost >15kg weight at 12 months - 24.2% of intervention 0% of control
- Fig B shows remission 4% of control and 45.6% of intervention
- Odds ratio per kg weight loss 1.32 (95% CI 1.23-1.41)
- 86.1% losing >15kg achieved remission

Possible implications for dietetic practice

- Dietitians will be needed not just for the initial weight loss on VLED but also for the reintroduction
- It could be a potential growth area for dietetics (both NHS & Private Practice)
- Risk, if we don’t consider it part of our toolkit others may use it without us?
Would going low carb be just as good?

Forums of people living with diabetes suggest yes, but what about the data?

CSIRO Low Carbohydrate Study
- Low-carbohydrate, high unsaturated/low saturated fat diet (LC)
- Investigated effect on CVD risk and T2DM
- 115 adults with type 2 diabetes, mean BMI 34.6+/- 4.3 kg/m²
- Either CHO:PRO:FAT of 14%:28%:58% vs 53% (low GI):17%:30%
- 61 completed the 2 years
- No difference weight, HbA1c or BP.
- LC groups saw greater reduction in medication, triglycerides and HDL

DIETSFIT Study
- Not a study of people with diabetes
- Looked at the effect of a low fat vs low carbohydrate diet
- Looked at genetic predictor of response to low carbohydrate diet (low carbohydrate genotype pattern based on 3 SNPs) and phenotype using baselines insulin concentration at 30 mins following a glucose load
- 609 adults were randomised for 12 months
- 22 groups sessions were used to deliver the information
- clinicaltrials.gov Identifier: NCT01826591
It seems more important the diet you can stick to?

- the mean 12-month macronutrient distributions were 48% vs 30% for carbohydrates, 29% vs 45% for fat, and 21% vs 23% for protein.
- Weight change at 12 months was −5.3 kg for the HLF diet vs −6.0 kg for the HLC diet (mean between-group difference, 0.7 kg [95%CI, −0.2 to 1.6 kg]). There was no significant
- Diet-genotype pattern interaction (P = .20) or diet-insulin secretion (INS-30) interaction (P = .47) with 12-month weight loss.

This could be put simply?

- Aggressive weight management in type 2 diabetes (typified by central obesity/insulin resistance) is an active therapy – it reverses the pathology.
- This may have the potential in some to achieve remission (need to define) in some people with type 2 diabetes perhaps depending on duration of their condition
- It is perhaps less important which way you achieve it, but more finding a way you can stick to

Patient Centered Care

What is it and isn't that dietetics is (or should be) about?
Management of Hyperglycemia in Type 2 Diabetes, 2015: A Patient-Centered Approach


1. Patient-Centered Approach

   "...providing care that is respectful of and responsive to individual patient preferences, needs, and values - ensuring that patient values guide all clinical decisions."

   • Gauge patient’s preferred level of involvement.
   • Explore, where possible, therapeutic choices. Consider using decision aids.
   • Shared Decision Making – a collaborative process between patient and clinician, using best available evidence and taking into account the patient’s preferences and values
   • Final decisions regarding lifestyle choices ultimately lie with the patient.

Figure 1. Modulation of the intensiveness of glucose lowering therapy

Approach to the management of hyperglycemia
What do the New Diabetes UK Guidelines 2018 say?

So, what is new?

A change of approach to look at food based recommendations:

Increasingly, national dietary guidelines have moved away from nutrient based recommendations e.g. eat x% energy from carbohydrate to describe foods and dietary patterns.

- This makes the guidelines more accessible to people living with diabetes
- It is also inline with the research supporting whole dietary pattern approaches rather than focusing on individual nutrients.

Glycaemic Control: Type 2 Diabetes

What is Recommended:

- Prioritise sustained weight loss of at least 5% in overweight individuals by reducing calorie (energy) intake and increasing energy expenditure
- Aim for a Mediterranean-style diet or equivalent healthy eating pattern
- Offer individualised education to support people to identify and quantify their dietary carbohydrate intake, encourage low glycaemic index (GI) foods and consider reducing the total amount of carbohydrates
- Aim for at least 150 mins per week of moderate to vigorous physical activity, over at least 3 days
Considerations about weight management

A recent meta-analysis concluded that weight loss of ≥5% is necessary to improve glycaemic control significantly:
- 7mmol/mol (0.6%) reduction in HbA1c in established Type 2 diabetes
- Up to 13mmol/mol (1.2%) in a newly diagnosed study group
- Longitudinal cohort studies have also indicated that change in BMI is a significant predictor of change in HbA1c, and that people with Type 2 diabetes who lose weight are more likely to achieve HbA1c targets than those with stable weight or weight gain


Considerations about weight management

More intensive weight management can achieve remission of Type 2 diabetes:
- 11% of people who achieve 8% weight loss (Gregg et al., JAMA 2012)
- 73% of people with weight loss of greater than 10kg
- 86% of those with weight loss >15kg (Dixon et al., 2008, Lean et al., 2017).

While sustained remissions have been reported after bariatric surgery (Buchwald et al., JAMA 2014), there remains a major challenge to maintain weight loss after non-surgical interventions.

What’s new and what’s not: Weight loss and dietary composition

No one dietary approach can be considered superior based on the current available evidence.

- The ideal proportion of macronutrients to recommend for optimal glycaemic control for T2DM is unclear, but total energy intake, weight loss and overall diet quality are significant factors.
- The role of low carbohydrate diets was acknowledged in the 2011 guidelines. Additional evidence has been included in this update. To date the evidence suggests that although clinical modest but statistically significant improvements can be seen at 3 months, but no differences are seen at 12 months

Snorgaard et al. (2017) BMJ Open Diabetes Res. Care 5(1)e000354
Low Carbohydrate Diets

- Carbohydrate content of the diet is the prime determinant of glycaemia.
- However, evidence thus far is limited with inconsistent findings, lack of studies of longer term effects, and lack of clarity on what constitutes the definition of low carbohydrate.
- A recent 2 year long study with good adherence found similar reductions in weight and HbA1c in both the low carbohydrate and high carbohydrate groups, but a greater reduction in diabetes medication was seen in the low carbohydrate group.


What’s New and What’s Not: Nutrition for Cardiovascular Disease Prevention

What is new including a shift in message:

- A shift from recommendations about nutrients to discussing patterns of eating, and how evidence for nutrients fit together.
- A lessening in emphasis for foods fortified with plant sterols and stanols – which is in line with NICE.

Nutrition for Cardiovascular Disease Prevention

Recommendations:
Dietary patterns, specifically the Mediterranean and DASH-style diets, are recommended to reduce CVD risk factors and CVD events in people with diabetes. Key features of these diets include:

- Decrease salt intake (<6g/day)
- Eat 2 portions of oily fish each week
- Eat more wholegrains, fruit and vegetables, fish, nuts and legumes (pulses)
- Eat less red and processed meat, refined carbohydrates and sugar-sweetened beverages
- Replace saturated fats (SFA) with unsaturated fats, and limit intakes of trans fatty acids (TFA)
- Limit alcohol intake to <14 units a week
Nutrition for Cardiovascular Disease Prevention

Recommendations additional points:
• Aim for modest weight loss of at least 5% in overweight individuals.
• Aim for at least 150 mins per week of moderate to vigorous physical activity, over at least 3 days.
• Products containing 2-3g of plant sterols and stanol esters per day can be recommended (note caveat).

Fat – a major issue?
• The exact proportion of energy that should be derived from total fat intake does not appear to be critical.
• In people with diabetes, studies recommending up to 40% of energy from fat (mostly unsaturated fat) have resulted in beneficial effects on lipid profiles, blood pressure and weight similar to approaches using less than 30% of energy from fat.

Esposito et al. (2015) BMJ Open, 5(8) e008222
• These findings suggest that any effects of fat on CVD risk factors are likely to be derived from the type of fat rather than the amount per se.

Dietary Patterns and Cardiovascular Disease Risk

Mediterranean Diet
• The Mediterranean diet has been associated with lower total and CVD mortality in both the general population and people with diabetes.
• Results from the PREDIMED randomised controlled trial including 7447 adults with Type 2 diabetes confirmed the beneficial effects of a Mediterranean diet supplemented with either extra virgin olive oil or with mixed nuts.
• In people with Type 2 diabetes, meta-analyses of trials of Mediterranean diets have reported greater reductions in total cholesterol, LDL cholesterol, triglycerides, and an increase in HDL cholesterol compared to control diets such as low fat diets and low carbohydrate diets.

Esposito et al. (2015) BMJ Open, 5(8) e008222
Estruch et al. (2013) NEJM 368. 1279-90
Martinez-Gonzalez et al. (2013) Progress Cardiovascular Dis. 58. 50-60
Dietary Patterns and Cardiovascular Disease Risk

Other dietary patterns

- Both low fat and low carbohydrate diets have also shown positive results in reducing CVD risk factors in people with Type 2 diabetes.

  Rees et al. (2013) Cochrane 2013(3) CD002128

- Low fat diet failed to show significant reductions in actual CVD events and CVD mortality in people with Type 2 diabetes when compared with usual care.

  Look AHEAD (2013) NEJM369(14) 54-57

- To date, there are no RCTs reporting the long-term effects of low carbohydrate diets on CVD endpoints in people with diabetes.

Worst Celebrity Diets?

‘CELEB DIETS TO AVOID IN 2018’ – BDA’s press release makes massive impact.

Frustrated with the never-ending nutrition nonsense in the media? The BDA celebrity diets press release aimed to rectify such nonsense – and the year the message was heard possibly louder and clearer than some of the previous.
What came out of it?

In December 1 and January 8th, "What's the Scoop" and "What's the Scoop" listings had a combined social reach of over 2 million people, with dietitians and influencers from Australia, Canada, and the UK also joining in. Since then, dietitians and the RDNs specialty groups and local health care providers have continued to use the go-to for highlighting dietary trends, new research, and best practices.

The "What's the Scoop" hashtag was started by Nick Ket, a dietitian and public health researcher who had been interested in data visualization for some time. "I wanted to find a way to make data more accessible and interesting, and I thought about how people could use a tool like this to share their own data," he said. "I asked my colleagues if they would be interested in participating, and they agreed."

Nick Ket decided to do something positive, and so he started tweeting about #What'stheScoop and sharing his own work with Twitter.

So to conclude

• A range of diets work in the management of type 2 diabetes
• Type 2 diabetes (typified by insulin resistance and obesity) may be best managed and actively aiming for remission by aggressive weight management (bariatric surgery or VLCD)
• Which we have evidence for and maybe low carbohydrate
• Media is challenging but we are moving forwards (I am confident?)
• The future is individualised food based messages, which dietitians are clearly the best qualified to do

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• Type 2 diabetes (typified by insulin resistance and obesity) may be best managed and actively aiming for remission by aggressive weight management (bariatric surgery or VLCD)
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Acknowledgements for Diabetes UK Nutritional Guidelines 2018

Diabetes UK Nutrition Working Group:
Pam Dyson
Cathy Bréen
Douglas Twenefour
Louise Goff
Alyson Hill
Pam Kalsi
Natasha Marsland
Paul McAulee
Lindsey Oliver

Peer reviewers:
Professor Nita Forouhi
Professor Michael Lean
Professor Michael Trenell

Organisations providing feedback:
Association of British Clinical Diabetologists (ABCD)
British Dietetic Association (BDA)
Primary Care Diabetes Society, PCDSS
Royal College of General Practitioners (RCGP)

Advanced Nutrition and Dietetics

BDA members receive 35% discount on BDA books

The Association of UK Dietitians
Proposed Changes to BDA Council