NON-SURGICAL REVERSAL OF TYPE 2 DIABETES MELLITUS

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INTRODUCTION

44-year-old woman, history of Bartters syndrome.
Height 1.54 metres, weight 69kg, waist circumference 102cm.
OGTT: Fasting glucose 8.9mmol/L, two-hour glucose 20.2 mmol/L, HaBA1c 7.9%. F. Insulin 22.9mu/mL. HOMA2: IR 3.39, %S 29.5

MANAGEMENT

She started taking metformin. However she was keen to pursue lifestyle driven reversal of type 2 diabetes. A Low carbohydrate, high fat (LCHF) diet was implemented. Carbohydrate intake was restricted < 20g a day
4 weeks: weight 66.9kg, periods became regular, bowel motions better.
3 months: weight 61.3kg and waist circumference 88cm.
6 months: weight 57kg and waist circumference 86cm. She stopped taking metformin.
4 years: weight maintained. Repeat OGTT: fasting glucose 5.8mmol/L, two-hour glucose 7.6mmol/L, HaBA1C 4.8% or 29mmol/mol.

PHYSIOLOGY/BIOCHEMISTRY

Excess Carbs ➔ glycogen.
Limited Glycogen stores.
Remainder converted to fat.
Stored as visceral adiposity (VA).
VA ➔ Insulin resistance.

Average UK diet – 250g/day.
Reducing carbs <20g/day: Insulin levels drop.
Glycogen stores expended.
After which, fat stores burnt.
Visceral adiposity targeted.
Ketones do not cause hunger.

1000cal carbs ➔ weight gain.
1000cal protein/fat ➔ wt loss.
Basis of low carb diets.

CONCLUSIONS

Worldwide epidemic in Type 2 diabetes; over 50million affected in Europe.
Current pharmacological agents not enough to prevent progression.
Because they do not adequately, or safely, target underlying visceral adiposity.
Sulphonylureas and insulin associated with increased 5-yr mortality.
Low Carbohydrate, high fat diets have the potential to reverse type 2 diabetes, prevent progression to type 2 diabetes while reducing co-morbidities associated with visceral adiposity.
LCHF diets have favourable effects on lipid profile.

EVIDENCE BASE/SAFETY

NEWCASTLE DIET: T2DM study; duration < 4 years.
800 calorie/day diet.
Plasma glucose normalised within 7 days.
Significant ↓ liver and pancreatic fat:
Targets root cause of T2DM.

PRIMARY CARE STUDY: T2DM/pre-Diabetes
Low Carbohydrate diet.
Significant reductions inHaBA1c, waist circu, weight, BP.
Medicatons withdrawn – potential cost saving £40,000/yr.

SIDE EFFECTS: Transient; mostly in first 2 weeks.
Dizziness, headaches, constipation (encourage water)
Restrictive diet? (need not be with good education)
No dangerous effects.
35% reduction in Triglycerides, 17% elevation in HDL-C!
However patients taking insulin & Sulphonylureas – titrate doses daily to avoid hypos.
Warn patients who have “reversed” DM that they need annual bood tests to exclude relapse.
Current data for type 2 diabetes/pre DM/Metabolic synd.

REFERENCES

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