

DR. ABBI LULSEGGED

KINGS COLLEGE HOSPITAL, LONDON, UNITED KINGDOM

## 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, HbA1c 7.9%. F. Insulin 22.9mu/L. 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, HbA1C 4.8% or 29mmol/mol.

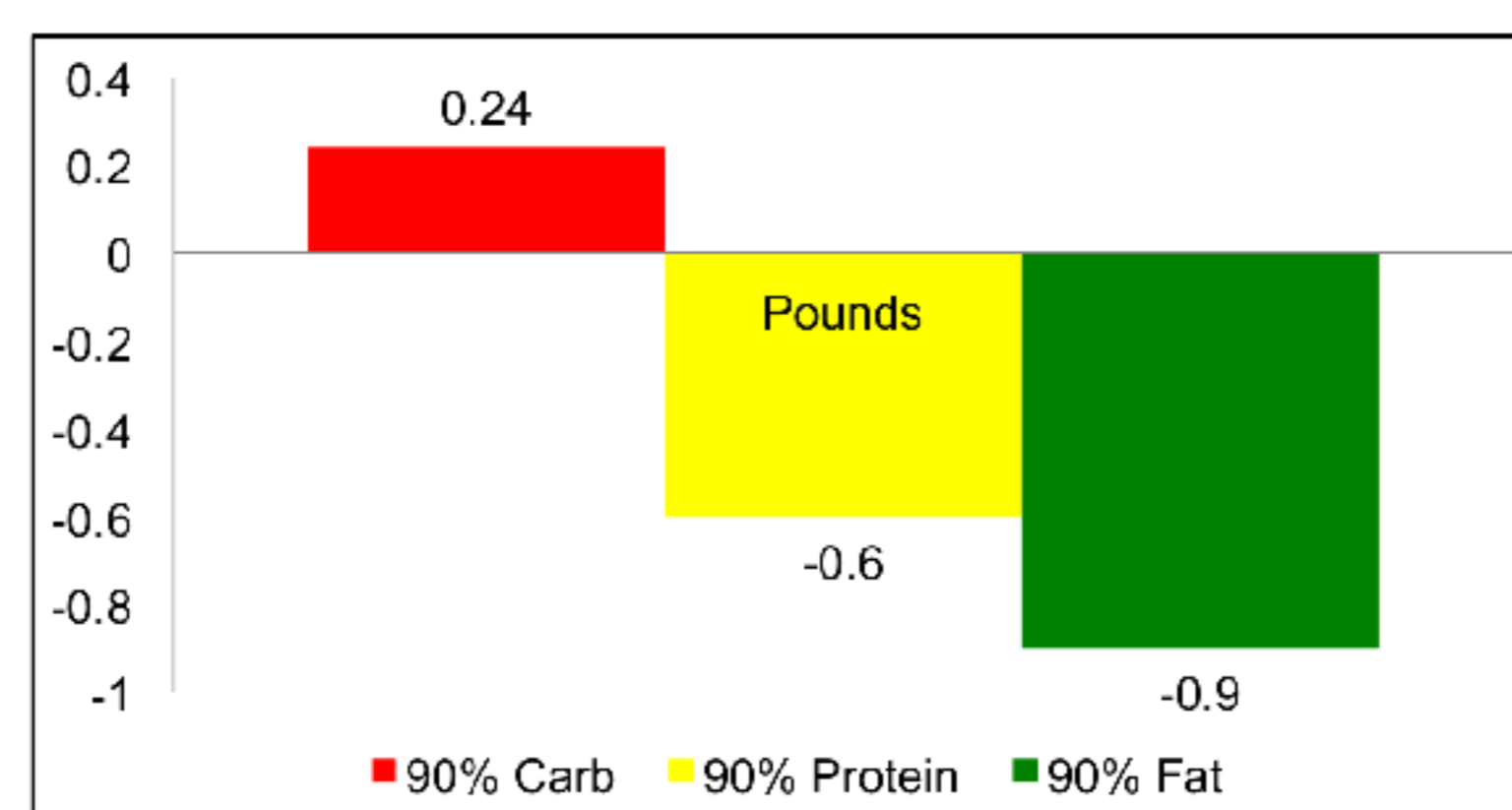
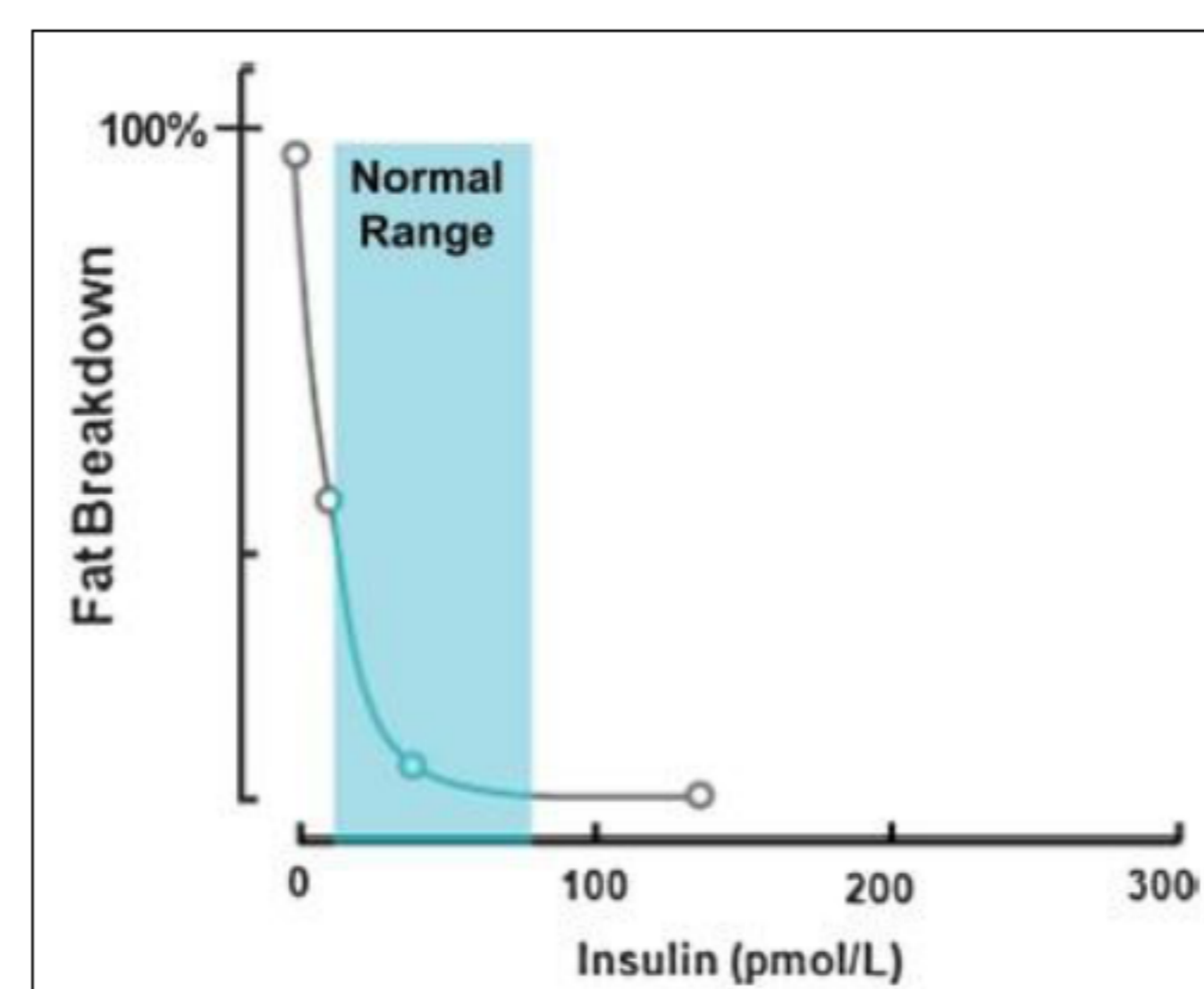
## PHYSIOLOGY/BIOCHEMISTRY

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.



Daily weight changes on 1000 cal isocaloric diets of diff compositions. Average daily weight change/day over 7 days.

## 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 inHbA1c, waist circu, weight, BP.

Medications withdrawn – potential cost saving £40,000/yr.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 blood tests to exclude relapse.

Current data for type 2 diabetes/pre DM/Metabolic synd.

## 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.

## References

*NEJM* 2008; 359 (3): 229-41

*Lancet* 1956, July 28: 155-161

*Diabetologia* 2008; 51:1781

Unwin et al. *Practical Diabetes* March 2014

*JCEM* 2016; 101:461-9

