

Minutes of Derby Medical Society Meeting 29th January 2020

Derby Medical School Lecture Theatre

Apologies

Susie Hewitt

Alistair McCance

Tony Henry

Jan Millar-Craig

Reversing type 2 diabetes in the real world

Professor Roy Taylor

Prof Taylor qualified from Edinburgh. He is a Professor at Newcastle and honorary consultant in Newcastle where he has been research diabetes for many years. He has worked with Pro Shulman and created the Newcastle MRI centre and has worked on elucidating how food is managed by the body in health and disease. His new book, "Life without diabetes" is due to be published later this month.

Prof Taylor opened his talk with a photo of a Buxton landmark. What is the connection between Buxton and diabetes? Banting and Best discovered insulin 99 years ago. Banting was wounded in the WW1. He recuperated in Buxton.

The nature of Type 2 diabetes and its progression was demonstrated in a landmark UK Prospective Diabetes Study (PDS) (1998). Robert Turner was researching this. This study showed a conventional treatment would lead to a steady rise in HbA1c and a plateau at 10 years. By this point, 50% were on insulin therapy.

If tight targets were followed, there was a parallel line showing that the rate of deterioration was the same in both cohorts. The 2 factors behind the deterioration was the insulin resistance and then also a beta-cell defect causing insulin not to be made properly.

Insulin resistance was shown to be present before the symptoms occurred but the PDS showed b-cell function declined over the years from diagnosis.

Things got interesting when patient's post-bariatric surgery showed a reversal of diabetes and this did not correlate with the consensus that the gastric hormones had been affected.

Further research elucidated the "Twin cycle hypothesis" in relation to the negative calorie balance in people with T2DM. By decreasing the fat, you normalise the fasting glucose.

Alongside this, the pancreas is affected by decreased fat because it normalises the insulin in response to eating.

The counterpoint study followed these initial findings. The study was consisted of 11 people and they had their hypoglycaemic agents were stopped. Prof Taylor designed a diet which was liquid and non-starchy foodstuffs. Within 7 days the fasting blood glucose had normalised, and this normal response was maintained.

He was then able to measure the fat in the liver and the pancreas using MRI. A rapid fall in liver fat and rapid normalisation of liver insulin sensitivities.

MRI scans showing the different fat content of the liver were then shown. This study then also showed exactly how much fat was stored in the liver. Over the test period, the subjects' liver fat had decreased significantly and gone from 36% to 2% at 8 weeks.

The pancreas showed the impact of a rise of 3mmol on diabetic vs non-diabetic patient. The study showed that pancreas function was almost normal with the very low calorie diet. The pancreas was therefore concluded to have woken up from dormancy.

Remove the fat from pancreas causes a reduction of diabetes in the patient.

A 6 month follow up study showed that this was maintained in those who kept their weight steady. The increased insulin secretion was also maintained.

Weight loss is a key factor. A significant weight loss is needed to show any positive impact on diabetes. This can be very difficult. People do well with a managed approach to their weight as it provides motivation.

Prof then showed a couple of examples in people who had maintained the change.

The DiRECT study attempted to put this into general practice. Intervention was carried out by the practice nurse. 49 practices were involved and looked a control group of 149 pts managed with usual guidelines and an intervention group who were aiming at 15kg weight loss. This was a diabetes remission study.

At 12months, there was a 46% remission in the intervention group.

All BP meds and hypoglycaemic medications are stopped on Day 1.

The people were then followed up at 2 years and showed 36% had maintained this at 24months.

The study was powered on achieving 22% remission rate based on human value and economics. These rates were related to how much weight people lost.

The significant changes were noticed in those people who lost over 15kg in weight. The remission is weight-loss dependent.

1 in 2 new diabetics in UK are BMI >30 at diagnosis. This is therefore not an issue of obesity. It is a matter of someone being too heavy for their body.

Weight management is critical for T2DM.

DiRECT Intervention: Rescue plans for those who relapse.

Total diet replacement (in those people who gained more than 4kg) then onto food reintroduction before proceeding to weight loss maintenance.

Almost half of the group needed a total diet replacement again.

Back to Buxton...

Go back to the pancreas – if beta-cell function is normal, you would not get DM. The detail is in the pancreas.

Complete recovery of beta-cell functional capacity was demonstrated to increase in those who responded positively to the weight loss i.e. there were those who lost weight and went into remission and another group who did not achieve remission despite weight loss.

There was increase in beta-cell function which had almost normalised by the 24month mark. This showed that beta-cells can be resurrected.

The non-responders were those who had longer duration of diabetes and despite >15kg weight loss, there was little to no improvement in beta-cell function.

The twin cycle hypothesis: aetiology of T2DM

Increase liver fat = resistance to insulin control of glucose which then slowly runs which then causes an increased plasma glucose.

If subcutaneous fat stores are full then liver fat has nowhere to go so then goes to VLDL – TG in the blood which is in excess and will be supplied to all tissues therefore goes to islets and coronary arteries.

Observing T2DM develop

Some people in the study lost weight and went into remission but relapsed with weight gain. This showed that there was increased plasma VLDL1-TG which then correlated with the change in pancreas fat.

Effects of achieving HbA1c <48mmol/l over 2 years.

The study monitored adverse events and showed that the intervention group did not have an increased significant adverse event in the intervention group compared to the control group.

There were various complications in those in the control group.

The patient's motivation is key in achieving good outcomes.

BMI distribution of individuals with type 2 diabetes – normal bell curve which were those of PDS study baseline. The median BMI is 27 – this shows that it is not BMI which dictates risk of development of T2DM.

A new concept will develop – the personal fat threshold is thought to dictate who does and who does not develop diabetes.

The underlying pathophysiology was modified enough to show a reversal and a reduced Qrisk from 23% to 7%.

The Newcastle Diet for weight loss

Simple

Practical

Spouse / partner is on board

Duration is limited and planned – 8-12week programme.

No additional exercise during this time – this can stop people from losing weight – this is due to compensatory eating renders exercise counterproductive during weight loss.

Website for more information and how to do it all.

go.ncl.ac.uk/diabetes-reversal

For new patient diagnosed: it's a choice. Fix it. Or take the pills and the risks.

Summary

Professor Roy gave a detailed and insightful talk about the aetiology of T2DM which he has elucidated through his many years working in this field.

He discussed important findings which go against conventional thinking regarding the development of T2DM. This include the concept that a specific BMI causes DM. His research has demonstrated that this is not the case – it is simply being too fat for your own body i.e. exceeding a “personal fat threshold” which causes fat accumulation in the liver and pancreas hence the development of diabetes.

He discussed his diet plan and how to apply this in primary care.

Patient's have a choice: Fix it or take the pill and the risks.

Register

Members 32

Students 7

Guest 6

Trial member 7