DIABETES UK
KNOW DIABETES. FIGHT DIABETES.

Causes of diabetes Clinical Studies Group

Annual progress report

April 2017-April 2018

In brief

This Clinical Studies Group (CSG) aims to improve our understanding of the causes of all forms of diabetes. This includes the genetic and environmental risk factors for diabetes, as well as matters relating to correct diagnosis. It also covers research looking at how often diabetes occurs in different groups of people and why.

So far, the group has held three face to face meetings and a number of teleconferences.

The group have reviewed priorities for Type 1 and Type 2 diabetes research, according to people living with diabetes, carers and healthcare professionals. They have also reviewed research funded across the UK in the CSG's area. Together, this has allowed the group to create a picture of the research landscape and identify four priority areas to date.

"As a lay member I've been really enthused by the discussions we've had on the UK Biobank and the possibilities that it presents for enhancing our knowledge of diabetes and other autoimmune conditions." ***Simon Coey, Northern Ireland***

"Better understanding of the causes of diabetes is essential for us to be able to prevent diabetes and also to guide the most appropriate treatment and follow-up for people with diabetes. I'm really enjoying working with a great team of experts to identify key research priorities." ***Professor Rebecca Reynolds, Edinburgh***

Progress so far

Finding research priorities

The group examined research happening across the UK alongside existing research priorities for Type 1 and Type 2 diabetes. These priorities were identified by people with diabetes, carers and healthcare professionals in an exercise known as a Priority Setting Partnership. More information about these priorities and the organisation that runs them, the James Lind Alliance, at:
www.diabetes.org.uk/research/our-approach-to-research/have-your-say

Together, they used this information to identify research gaps, and from these gaps, priority areas. Topics were prioritised initially by the CSG itself, before the results were presented to and endorsed by the Lay & Healthcare Professional Forum (lay and healthcare professional members of all CSGs together).

Improving diagnosis in older people through big data and new measurements

Misdiagnosis appears to be a priority area for research. A diabetes diagnosis (typically Type 1 or Type 2) is based on clinical characteristics (such as BMI) and blood tests (e.g tests on the immune system), but this approach isn't always effective. Diabetes misdiagnosis leads to people receiving the wrong treatment, which can mean they can't control their blood glucose levels as well, putting them at higher risk of diabetes complications.

Getting the diagnosis right can be particularly challenging in people over 30 years of age. Due to the high number of people living with Type 2 diabetes in this age group, diagnosing Type 1 diabetes, or rarer genetic causes of diabetes, is difficult and often missed.

Research in this area could be supported using the UK Biobank. The UK Biobank has data on over 500,000 people across the UK, allowing scientists to monitor their long-term health and learn more about a range of conditions. The CSG believes that the Biobank could begin collecting two key measurements: c-peptide and auto-antibody levels.

C-peptide measurements allow researchers to see how much natural insulin a person is producing. C-peptide levels drop over time in people with Type 1 diabetes, as their insulin-producing beta cells are destroyed and the level of insulin they produce begins to fall. Therefore, this measurement is a useful way to distinguish between Type 1 and Type 2 diabetes.

In Type 1 diabetes, immune cells turn on the pancreas. Some of these cells produce molecules called auto-antibodies that target several specific proteins present in the insulin producing cells. Autoantibody measurements tell us about the immune system, and whether it is primed to attack its own body. The number of different auto-antibodies that a person has in their blood is used to help decide if someone has Type 1 diabetes, or is at very high risk of developing it in the future.

Collecting these new measurements through the UK Biobank would provide information on thousands of people. It would help scientists to work out how often diabetes could be being misdiagnosed, and why this might be happening. It would also provide insights into what that might mean for peoples' health or costs to the NHS, as well as long-term data on responses to treatments or the development of complications.

Making the most of existing data

There are a number of existing registers of people that could be utilised for research. For example, GO-SHARE, a Scottish initiative to establish a register of people willing to allow scientists to securely access their health records in Scotland.

Bringing data together across these existing registers could help identify people at risk of Type 2 diabetes, helping scientists to understand the causes and progression of the condition. It could also form a basis for new population based approaches to preventing Type 2 diabetes. Following those identified as being at risk through to diagnosis could help to classify populations by specific common risk factors and link to them the development of complications.

Comparing gestational diabetes care across the nations

There are currently different criteria used in Scotland and England to diagnose gestational diabetes (diabetes which develops during pregnancy).

These differences present an opportunity for scientists to compare the health of women diagnosed and treated in Scotland and England. For example, they could look at whether the point at which someone is diagnosed or the treatment they receive during pregnancy has an

impact on the health of their babies or their own likelihood of developing Type 2 diabetes after pregnancy.

Understanding what happens earlier on in Type 1, Type 2 and gestational diabetes

There is a need to better understand how long it takes to lose insulin-producing beta cells, or for them to stop working properly, in Type 1, Type 2, and gestational diabetes. Alongside a deeper understanding of the roles of healthy gut bacteria (our "microbiome"), obesity and other factors that influence the sensitivity of cells to insulin, this could help to identify the underlying causes of diabetes, thereby informing future prevention and treatment strategies.

Engaging with communities

The CSG presented their emerging ideas at the Diabetes UK Professional Conference and at the Lay and Healthcare Professional Forum.

The priority area of using the UK Biobank to improve diabetes diagnosis is an important theme across all of the CSGs. Because of this, the CSG will work with other groups, consulting with people living with diabetes and scientists, to develop ideas further.

Links and collaborations

The CSG plans to develop links and collaborations with other groups or individuals over the coming year.

Next steps

The CSG will continue to develop the research priorities, considering the evidence that lies behind each of them. They will also look at how relevant they are to clinical healthcare, how feasible they are to achieve, and the potential costs involved.

To support their work to continue prioritising research questions around the causes of diabetes, they plan to complete a review of current published evidence on environmental factors involved in causing Type 1 diabetes.

As their work develops, they will create a plan of action for research in this area.

Find out more

To find out more about the work of the CSG, please contact csgs@diabetes.org.uk to be put in contact with the group.

CSG members

Current CSG membership, including affiliations.

Name	Affiliation	Role on group
Professor Rebecca Reynolds	University of Edinburgh	Chair
Professor Susan Wong	University of Cardiff	Deputy Chair
Mr Ron McDowall	Lay representative	Member
Mrs Jinty Moffett	Lay representative	Member
Mr Simon Coey	Lay representative	Member
Professor Andrew Hattersley	University of Exeter	Member
Professor Keith Godfrey	University of Southampton	Member
Professor Katherine Owen	University of Oxford	Member
Dr Calum Sutherland	University of Dundee	Member
Dr Alistair Williams	University of Bristol	Member
Dr Sara White	King's College London	Member
Dr Nafeesa Dhalwani	University of Leicester	Member
Samantha McKinnon	Western Sussex Hospitals NHS Foundation Trust	Member