Research unlocks personalized care in type 2 diabetes

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Moving away from a "one-size fits all" care regime has the potential to transform care for people with type 2 diabetes, a University of Dundee study has shown.

Experts at the University's School of Medicine, working with the University of Exeter, have established a means of determining how people with type 2 diabetes differ from each other, and how clinical variation between them affects their long-term risks and response to treatment.

The study analyzed data from more than 23,000 people with type 2 diabetes, utilizing it to develop a new way to visualize how much people with type 2 diabetes differ from each other based upon nine clinical characteristics.

The research, conducted with Madras Diabetes Research Foundation, has been published today in *Nature Medicine*.

"Clinically, we need to move away from a one-size-fits all approach to the management of people with type 2 diabetes and be more precise in their care," said Ewan Pearson, professor of diabetic medicine at Dundee.

"Our study demonstrates how we can look at an individual with type 2 diabetes and illustrate in an intuitive way the main reasons they have diabetes and use this to manage them better to reduce their individual risks.

"Imagine three women diagnosed with type 2 diabetes at the age of 60. One may only be slightly overweight and have developed diabetes due to reduced insulin production from the pancreas. She will have slow progression of her diabetes and lower risk of complications.

"The second, may have particularly high blood pressure and be more prone to eye complications.

"The third may be very overweight with high blood fats and be more

resistant to the effects of insulin, meaning she would be at increased risk of heart disease. They all have type 2 diabetes but for very different reasons and with very different profiles, meaning that different treatments may result in better outcomes, depending on their circumstances."

More than 4 million people in the U.K. have type 2 diabetes, with complications arising from the condition including life threatening heart and kidney disease, while it is also the biggest cause of blindness and amputation in the U.K.

Anand Nair, the lead analyst on the Dundee study, said, "Type 2 diabetes is a complex disease caused by many different mechanisms."

"Some people develop type 2 diabetes due to different mechanisms than others and can therefore differ dramatically in their clinical characteristics, such as their body weight, blood fat, blood pressure or their genes. This new approach helps to greatly simplify this complexity for both clinicians and patients."

John Dennis, of the University of Exeter Medical School, who supported the research, said, "At the moment, clinicians are in the difficult position of making decisions that impact on health in type 2 diabetes based on very little evidence. Our findings, use cutting-edge data science applied to the UK's health data, can provide more personalized information to support the clinical care of people with type 2 diabetes."

The study is titled "Heterogeneity in phenotype, disease progression and drug response in type 2 diabetes."

More information: Anand Thakarakkattil Narayanan Nair et al, Heterogeneity in phenotype, disease progression and drug response in type 2 diabetes, *Nature Medicine* (2022). DOI:

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