Genetic insights into type 2 diabetes and some cancers

Type 2 diabetes shares genetic connections with multiple cancers, according to a new study, providing hope that new avenues of research can be opened.

A study presented at the Diabetes UK Professional Conference has revealed that genetic variants help explain why people with type 2 diabetes are at an increased risk of developing breast, colorectal and pancreatic cancers. Insights into the interplay between the conditions could inform better cancer prevention and treatment strategies for people with type 2 diabetes.

Cancer is now the leading cause of death in people with diabetes in England, and cancer survival rates in those with diabetes lag behind those of the general population. While it is known that type 2 diabetes can increase the risk of developing a number of serious health complications, including certain cancers, the biological factors contributing to these links have not been well understood.

The complex mix of drivers that influence type 2 diabetes includes age, body weight and genetics. Hundreds of genetic variants play a role in its development, and some of these increase the chances of getting cancer. Researchers at the University of Surrey investigated the genetic relationships between the conditions to explain why some individuals with type 2 diabetes also develop cancer.

DNA data from over 36 000 people from several European countries was analysed. This included people with type 2 diabetes and post-menopausal breast cancer, colorectal cancer and pancreatic cancer – the three types they are most at risk of developing. A pioneering approach was adopted to study how genetic variants simultaneously affect all four conditions.

Two genetic variants were pinpointed as being key contributors to the development of type 2 diabetes and some cancers. One was linked to the risk of developing both breast cancer and type 2 diabetes; the other affects type 2 diabetes and breast, colorectal and pancreatic cancer risk. Those carrying either of these genetic variants are at increased risk of developing both type 2 diabetes and these cancers.

The researchers also identified 17 variants that directly increase the risk of developing type 2 diabetes and, through biological processes linked to it, indirectly increase cancer risk. The higher glucose and insulin levels, obesity, inflammation and hormonal changes found in type 2 diabetes may create an environment in which it is easier for cancer to develop.

It is hoped that these findings of shared genetic pathways will, in time, lead to our ability to the earlier identification of people who are at risk of both type 2 diabetes and certain cancers, while paving the way for more personalised ways to prevent and treat these conditions. The investigators emphasise that people can be supported to reduce their risk by managing weight, eating well, keeping active and not smoking. ■