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The Genetic Overlap of Type 2 Diabetes and Depression - Finding From the Swedish Twin Registry

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Introduction: A bidirectional association between type 2 diabetes and depression has been consistently reported. It is associated with worse biomedical outcomes and increased mortality. One possible question is whether the co-occurrence of type 2 diabetes and depression is due to genetic and/or environmental vulnerabilities in common to the two traits.

Aims: To examine the genetic relationship between type 2 diabetes and depression at a population level.

Objectives: To quantify the genetic overlap between type 2 diabetes and depression using the Swedish Twin Registry.

Method: The study included 43,565 twin pairs (12,363 monozygotic pairs and 31,202 dizygotic pairs). The primary outcomes were lifetime diagnosis of type 2 diabetes and depression from the Swedish National Hospital Discharge Registry. Standard bivariate twin models were fitted to the raw data to estimate the genetic and environmental (co)variance of the two traits.

Results: Heritability estimates for lifetime diagnoses of type 2 diabetes and depression were similar to previous estimates, at 77% and 42% respectively. The phenotypic correlation between type 2 diabetes and depression was 0.14 (95%CI: 0.11-0.17), of which 58% was due to shared genetic influences. When covariates (age and gender) were included, the genetic contribution to the phenotypic correlation reduced to 51%.

Conclusion: This is the first study to demonstrate a small but significant genetic overlap between type 2 diabetes and depression at a population level, using hospital-registry records.