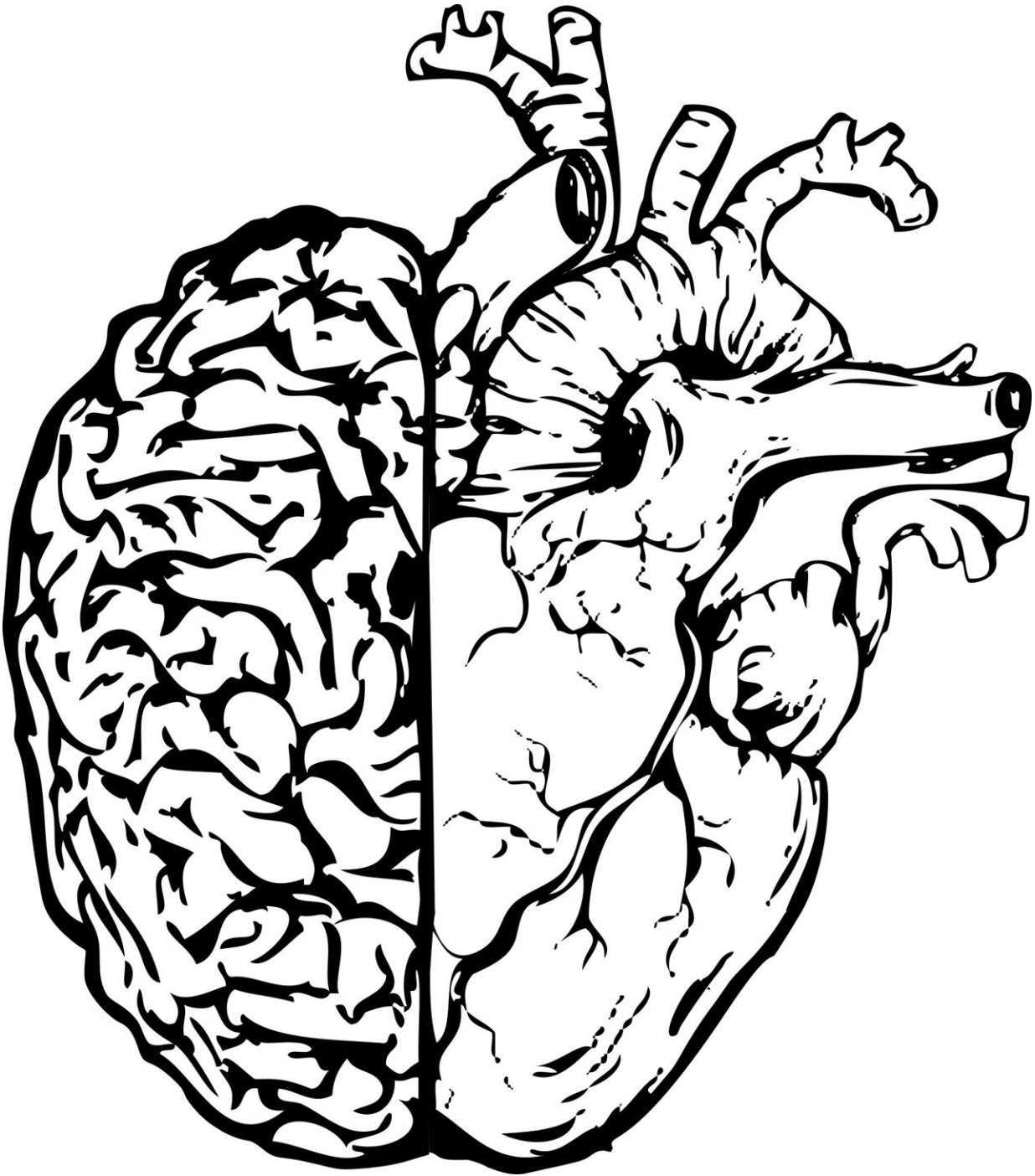


The same genes may underlie cardiometabolic diseases and dementia

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Being affected by several cardiometabolic diseases such as diabetes,

heart disease and stroke, is linked to a greatly increased risk of dementia and Alzheimer's disease. A new twin study by researchers from Karolinska Institutet suggests that the same genes may be behind the risk of both cardiometabolic diseases and dementia. The findings have been published in *European Heart Journal*.

Cardiometabolic diseases such as type 2 diabetes, [heart disease](#) and stroke are a growing challenge in society. With an [aging population](#) and improved health care, people are living longer with [cardiometabolic diseases](#) more likely to get two or more of these conditions in a lifetime, known as cardiometabolic multimorbidity. It affects an estimated 30% of [older adults](#) and leads to increased mortality.

"We know that type 2 diabetes, heart disease and stroke are well-established individual risk factors for dementia. As the population ages, more and more people are affected by several co-morbid cardiometabolic diseases, but few studies have dealt with the effect of this multimorbidity on dementia risk and whether genetic factors affect the relationship," says Abigail Dove, Ph.D. student at the Aging Research Center, Karolinska Institutet and the study's first author.

Comprehensive twin study

The researchers have therefore examined twins over the age of 60 who were registered in the Swedish Twin Registry between March 1998 and December 2002. The more than 17,000 individuals were categorized based on whether they had one or more cardiometabolic diseases or whether they were free of these conditions.

All study participants were cognitively healthy at the beginning of the study. The participants' health status was monitored for up to 18 years, allowing the researchers to establish who eventually developed dementia and who did not.

"We discovered that cardiometabolic multimorbidity is linked to a more than doubled risk of vascular dementia and a 50% increased risk of Alzheimer's disease," says Abigail Dove.

For each cardiometabolic disease the person had, the risk of all types of dementia increased by 42%. The corresponding figure for Alzheimer's disease is 26% and 64% for [vascular dementia](#).

Higher risk in early onset of disease

The study also found that the risk of developing dementia was higher if a person was diagnosed with cardiometabolic diseases in middle age compared to if those diseases developed later in life. According to the study, one explanation for this may be that if the disease debuts earlier in life, it can be a more aggressive form.

"These findings underscore the need for special monitoring of individuals with cardiometabolic diseases to reduce their risk of developing dementia at an older age," says Abigail Dove.

Genetic factors influence

The researchers also took a closer look at about 400 specific pairs of twins from the study population that were "mismatched"—that is, the two twins in a pair differed from each other in terms of both the prevalence of cardiometabolic disease and the possible development of dementia.

Among the mismatched dizygotic twins who share 50% of their genes, the twin with cardiometabolic disease was more likely to also be the one who developed dementia. However, among mismatched pairs of identical twins who are genetic copies of each other, the risk of dementia

was similar for both twins regardless of cardiometabolic disease status.

"The results suggest that the same [genetic factors](#) may contribute to both cardiometabolic diseases and [dementia](#)," says Abigail Dove.

More information: Abigail Dove et al, Cardiometabolic multimorbidity and incident dementia: the Swedish twin registry, *European Heart Journal* (2022). [DOI: 10.1093/eurheartj/ehac744](https://doi.org/10.1093/eurheartj/ehac744)

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