New risk score strongly predicts dementia chances within 14 years

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A new dementia risk score, which draws on 11 mostly modifiable risk factors, identifies people at risk—from midlife onward—of developing the disease within the next 14 years, suggests a large long term study

published in the open access journal *BMJ Mental Health*.

The UK Biobank Dementia Risk Score, or UKBDRS for short, outperformed three other widely used risk scores originally developed in Australia (ANU-ADRI), Finland (CAIDE), and the U.K. (DRS), the findings show.

Up to 50 million people worldwide are thought to be living with dementia, with numbers projected to triple by 2050, note the researchers. But targeting key risk factors, several of which involve lifestyle, could potentially avert around 40% of cases, they point out.

Various risk scores have been devised to try and predict a person's chances of developing dementia while preventive measures are still possible. But these scores have proved unreliable across different age groups and geographies, and some rely on expensive and invasive tests, precluding their use in primary care, they add.

To try and get round these issues, the researchers drew on two large groups of 50- to 73-year-olds participating in two long term studies—one group for developing the new risk score (UK Biobank study) and one for validating it (Whitehall II study).

In all, 220,762 (average age just under 60) people from the UK Biobank study and 2,934 (average age 57) from the Whitehall II study were included in the final analysis.

The researchers compiled a list of 28 established factors associated with a heightened or reduced risk of developing dementia, to which they applied a statistical method (LASSO regression) designed to identify and discard the least relevant factors, and so focus the score on the strongest predictors.

This produced 11 predictive factors for any type of dementia—the UK Biobank Dementia Risk Score (UKBDRS).

The 11 factors were: age; education; history of diabetes; history of/ current depression; history of stroke; parental dementia; economic disadvantage (Townsend deprivation index) high blood pressure; high cholesterol; living alone; and male sex.

The APOE gene, which is involved in the production of a protein that helps carry cholesterol and other types of fat in the bloodstream, is a known risk factor for dementia. Its carriage was known for 157,090 participants in the U.K. Biobank study and 2,315 of those in the Whitehall II study and added to the risk score (UKBDRS-APOE).

Within 14 years, 3,813 (nearly 2%) and 93 (just over 3%) participants developed dementia in the UK Biobank and Whitehall II groups, respectively.

The predictive values of UKBDRS with and without APOE were compared with that of age alone; and three other widely used risk scores—ANU-ADRI (Australian National University Alzheimer's Disease Risk Index), CAIDE (Cardiovascular Risk Factors, Aging and Dementia), and DRS (Dementia Risk Score).

UKBDRS-APOE produced the highest predictive score, closely followed by the UKBDRS, and then age alone, followed by DRS, CAIDE, and finally ANU-ADRI.

The researchers suggest that the accuracy of their risk score could be further improved by adding cognitive tests, a brain scan, and a blood test for indicators of neurodegeneration. But as these are expensive and/or time intensive they may not always be available.

"Therefore, the UKBDRS may best be used as an initial screening tool to stratify people into risk groups, and those identified as high risk could then benefit from the more time intensive follow-up assessments described above for more detailed characterization," suggests lead author Dr. Raihaan Patel.

"It's important to remember that this risk score only tells us about our chances of developing dementia; it doesn't represent a definitive outcome," emphasizes lead co-author associate Professor Sana Suri. "The importance of each risk factor varies and given that some of the factors included in the score can be modified or treated, there are things we can all do to help reduce our risk of dementia."

Referring to the illustrative example provided, she explains, "While older age (60 and above) and APOE confer the greatest risk, modifiable factors, such as diabetes, depression, and high blood pressure also have a key role. For example, the estimated risk for a person with all of these will be approximately three times higher than that of a person of the same age who doesn't have any."

The researchers acknowledge various limitations to their research. The classification of dementia differed between the two groups as did the demographics, lifestyle, and health of the participants.

There were also significantly fewer women in the Whitehall II group. And all the participants were mostly white and less likely to live in areas of deprivation than the general U.K. population.

"There are many steps we would need to take before we can use this risk score in clinical practice," cautions lead author Dr. Raihaan Patel.

"It's well known that dementia risk, onset, and prevalence vary by race, ethnicity and socioeconomic status. Therefore, while the consistent

performance of UKBDRS across these two independent groups boosts our confidence in its viability, we need to evaluate it across more diverse groups of people both within and beyond the U.K.," he concludes.

More information: Melis Anatürk et al, Development and validation of a dementia risk score in the UK Biobank and Whitehall II cohorts, *BMJ Mental Health* (2023). DOI: 10.1136/bmjment-2023-300719