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High cholesterol in midlife raises risk of late-life dementia, Kaiser Permanente study finds

Largest, longest study shows even moderately elevated cholesterol level boosts dementia risk

Elevated cholesterol levels in midlife – even levels considered only borderline elevated – significantly increase the risk of Alzheimer's disease and vascular dementia later in life, according to a new study by researchers at Kaiser Permanente's Division of Research and the University of Kuopio in Finland. The study appears in the journal *Dementia & Geriatric Cognitive Disorders*.

The four-decade study of 9,844 men and women found that having high cholesterol in midlife (240 or higher milligrams per deciliter of blood) increases, by 66 percent, the risk for Alzheimer's disease later in life. Even borderline cholesterol levels (200 – 239 mg/dL) in midlife raised risk for late-life vascular dementia by nearly the same amount: 52 percent. Vascular dementia, the second most common form of dementia after Alzheimer's disease, is a group of dementia syndromes caused by conditions affecting the blood supply to the brain. Scientists are still trying to pinpoint the genetic factors and lifestyle causes for Alzheimer's disease.

By measuring cholesterol levels in 1964 to 1973 based on the 2002 Adult Treatment Panel III guidelines (the current practice standard) when the Kaiser Permanente Northern California members were 40 to 45 years old, then following the participants for 40 years, this study is the largest long-term study with the most diverse population to examine the midlife cholesterol levels and late-life dementia. It is also the first study to look at borderline high cholesterol levels and vascular dementia, rather than just Alzheimer's disease.

"Our study shows that even moderately high cholesterol levels in your 40s puts people at greater risk for Alzheimer's disease and vascular dementia decades later," said the study's senior author, Rachel Whitmer, Ph.D., a research scientist and epidemiologist at the Kaiser Permanente Division of Research in Oakland, Calif. "Considering that nearly 100 million

Americans have either high or borderline cholesterol levels, this is a disturbing finding. The good news here is that what is good for the heart is also good for the mind, and this is an early risk factor for dementia that can be modified and managed by lowering cholesterol through healthy lifestyle changes."

This study, funded by the National Institutes of Health, adds to other research emphasizing the importance of addressing dementia risk factors in midlife, before an underlying disease or symptoms appear, the researchers said.

"Our findings add to the existing body of evidence on a degree of overlap between two dementia types in terms of risk factors, symptoms and neuropathology," said the study's lead author, Alina Solomon, MD, a researcher with the Department of Neurology at the University of Kuopio, Finland. "Dementia and cardiovascular disease are common major health problems, share several risk factors and often occur simultaneously, interacting with one another. A holistic approach that addresses multiple major health problems simultaneously is needed to effectively manage these disorders."

The study tracked members of Kaiser Permanente's Northern California Medical Group from 1967 to 2007 by using the multiphasic testing records pioneered by Kaiser Permanente founding physician Morris Collen, MD, who is widely regarded worldwide as a health care informatics pioneer. Of the original 9,844 participants, 598 were diagnosed with Alzheimer's disease or vascular dementia between 1994 and 2007, when the participants were between 61 and 88 years old.

This epidemiological study did not examine the mechanism of the link between cholesterol levels and dementia.

This study is part of an ongoing body of research at Kaiser Permanente to better understand the risk and protective factors for dementia. Dr. Whitmer recently authored two dementia-related studies: one that found a larger abdomen in midlife increases risk of late-life dementia, and one that showed that low blood sugar events in elderly patients with type 2 diabetes increase their risk for dementia. Another Kaiser Permanente study, led by Valerie Crooks of Kaiser Permanente in Southern California, found that having a strong social network of friends and family appears to decrease risk for dementia.

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About the Kaiser Permanente Division of Research (<http://www.dor.kaiser.org/>)

The Kaiser Permanente Division of Research conducts, publishes, and disseminates epidemiologic and health services research to improve the health and medical care of Kaiser Permanente members and the society at large. It seeks to understand the determinants of illness and well-being and to improve the quality and cost-effectiveness of health care. Currently, DOR's 400-plus staff is working on more than 250 epidemiological and health services research projects.

About Kaiser Permanente

Kaiser Permanente is committed to helping shape the future of health care. We are recognized as one of America's leading health care providers and not-for-profit health plans. Founded in 1945, our mission is to provide high-quality, affordable health care services to improve the health of our members and the communities we serve. We currently serve 8.6 million members in nine states and the District of Columbia. Care for members and patients is focused on their total health and guided by their personal physicians, specialists and team of caregivers. Our expert and caring medical teams are empowered and supported by industry-leading technology advances and tools for health promotion, disease prevention, state-of-the art care delivery and world-class chronic disease management. Kaiser Permanente is dedicated to care innovations, clinical research, health education and the support of community health. For more information, go to: www.kp.org/newscenter.

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