Obesity, hypertension, high glucose in early adulthood may take heavy toll on cognition in late life

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By Suzanne Leigh

As mounting evidence points to the link between cardiovascular disease and dementia, a new study led by UC San Francisco finds that young adulthood may be the most critical period to practice the healthy lifestyle habits that may protect the brain from cognitive decline decades later.

The study found that high body mass index (BMI), high glucose and hypertension in early adulthood ? risk factors that are linked to unhealthy diet, smoking and sedentary lifestyle ? were associated with the greatest change in cognition in late life compared with other stages of adulthood. These risks factors amounted to a doubling of the average rate of cognitive decline, the researchers found in their study, publishing in the online issue of Neurology on March 17, 2021.

Obesity alone ? a BMI of over 30 ? during young adulthood was also associated with double the average rate of cognitive decline in late life, and a similar impact was noted with high systolic blood pressure, a type of hypertension. While the study found that cholesterol was not associated with greater decline in later cognition, they found a pronounced drop related to high blood glucose levels in early adulthood.

To arrive at these results, the researchers combined data from four studies that followed a total of approximately 15,000 adults, whose ages at enrollment ranged from 18 to 30 and 45 to 95. Cognitive skills and processing speeds were tested every one to two years, with BMI, blood glucose levels, blood pressure and cholesterol checked at least three times over the course of the study.

Promising modifiable risk factors?
While previous research has established an association between midlife cardiovascular risk factors and worse cognitive outcomes in late life, little has been known about the impact of these risk factors in early adulthood, said first author Kristine Yaffe, MD, of the UCSF Departments of Psychiatry & Behavioral Sciences, Neurology, and Epidemiology & Biostatistics, and of the San Francisco VA Medical Center.

Cardiovascular risk factors are among the most promising modifiable risk factors for prevention of cognitive aging and dementia, said Yaffe, also of the UCSF Weill Institute for Neurosciences. Our findings suggest that attention should be broadened to consider early adult cardiovascular health, since increasing trends in diabetes and obesity in this age group, coupled with a higher level of underdiagnosed risk factors could have significant public health implications for cognitive health.

Mechanisms that tie cardiovascular risk factors with cognitive decline include elevated inflammation and oxidative stress that may disrupt blood flow to the brain, increase stiffness of the arteries and impair the blood-brain barrier. Research has also shown that these risk factors may increase the buildup of amyloid plaques, a signature of Alzheimer’s disease.

The participants had been recruited in the Coronary Artery Risk Development in Young Adults (CARDIA) study, Multi-Ethnic Study of Atherosclerosis (MESA), Cardiovascular Health Study (CHS) and Health, Aging and Body Composition study (Health ABC) and were followed from 10 to 30 years. Since the researchers wanted to look at trends over several decades, they used data from the younger cohorts to impute cardiovascular risk factors across the life course. They then examined the association between those risk factors and the late-life cognitive decline identified in older cohorts.

Increasing obesity may signal more dementia decades later

The study raises questions about future generations of elderly people dealing with cognitive decline that may have been exacerbated by poor lifestyle habits in young adulthood. According to the Centers for Disease Control and Prevention, the prevalence of obesity was 40 percent among adults in their 20s and 30s in 2017 to 2018, compared with an overall adult obesity rate of 10 percent in the 1950s.

It’s important to note that the study shows an association, not a cause-and-effect relationship, between cardiovascular risks in young adulthood and cognitive impairment in late life, said Yaffe. The good news is that although we are seeing more dementia with the aging of the population, the incidence of dementia, at least in wealthier countries, has fallen. This could be attributed to improved education and access to health care, as well as better treatment of cardiovascular risk factors.

But we should be concerned about population trends in obesity, as well as diabetes and sedentary behavior. And we should consider that despite improvements in treatment, cardiovascular risk factors go undiagnosed and untreated, especially in younger adults.

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UCSF Psychiatry and Behavioral Sciences conducts its clinical, educational, and research efforts at a variety of locations in Northern California, including Langley Porter Psychiatric Hospital and Clinics [13]; UCSF Medical Centers at Parnassus Heights, Mission Bay, and Mount Zion; UCSF Benioff Children's Hospitals in San Francisco [14] and Oakland [15]; Zuckerberg San Francisco General Hospital and Trauma Center; the San Francisco VA Health Care System; UCSF Fresno; and numerous community-based sites around the San Francisco Bay Area.

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The UCSF Weill Institute leverages UCSF's unrivaled bench-to-bedside excellence in the neurosciences. It unites three UCSF departments?Neurology, Psychiatry, and Neurological Surgery?that are highly esteemed for both patient care and research, as well as the Neuroscience Graduate Program, a cross-disciplinary alliance of nearly 100 UCSF faculty members from 15 basic-science departments, as well as the UCSF Institute for Neurodegenerative Diseases, a multidisciplinary research center focused on finding effective
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