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UCLA-VA study names India dietary staple as potential Alzheimer's weapon

Yellow pigment in curry spice blocks, breaks up brain plaques in mice

A dietary staple of India, where Alzheimer's disease rates are reportedly among the world's lowest, holds potential as a weapon in the fight against the disease.

The new UCLA-Veterans Affairs study involving genetically altered mice suggests that curcumin, the yellow pigment in curry spice, inhibits the accumulation of destructive beta amyloids in the brains of Alzheimer's patients and also breaks up existing plaques.

Reporting in the Dec. 7, 2004, online edition of the Journal of Biological Chemistry, the research team also determined curcumin is more effective in inhibiting formation of the protein fragments than many other drugs being tested as Alzheimer's treatments. The researchers found the low molecular weight and polar structure of curcumin allow it to penetrate the blood-brain barrier effectively and bind to beta amyloid.

In earlier studies (Journal of Neuroscience, 2001; 21:8370-8377; Neurobiology of Aging, 2001; 22:993-1005), the same research team found curcumin has powerful antioxidant and anti-inflammatory properties, which scientists believe help ease Alzheimer's symptoms caused by oxidation and inflammation.

The research team's body of research into curcumin has prompted the UCLA Alzheimer's Disease Research Center (ADRC) to begin human clinical trials to further evaluate its protective and therapeutic effects. More information about enrolling in this and other clinical trials at the Center is available by calling (310) 206-3779 or online at http://www.npistat.com/adrc/Treatment.asp.

"The prospect of finding a safe and effective new approach to both prevention and treatment of Alzheimer's disease is tremendously exciting," said principal investigator Gregory Cole. He is professor of medicine and neurology at the David Geffen School of Medicine at UCLA, associate director of the UCLA Alzheimer's Disease Research Center, and associate director of the Geriatric Research, Education and Clinical Center at the VA Greater Los Angeles Healthcare System at Sepulveda, Calif.

"Curcumin has been used for thousands of years as a safe anti-inflammatory in a variety of ailments as part of Indian traditional medicine," Cole said. "Recent successful studies in animal models support a growing interest in its possible use for diseases of aging involving oxidative damage and inflammation like Alzheimer's, cancer and heart disease. What we really need, however, are clinical trials to establish safe and effective doses in aging patients."

The research was funded by the Siegel Life Foundation, Veterans Affairs, Alzheimer's Association, UCLA Alzheimer's Disease Research Center and private donors.

Alzheimer's disease (AD) is an irreversible, progressive brain disorder that occurs gradually and results in memory loss, unusual behavior, personality changes, and a decline in thinking

abilities. These losses relate to the death of brain cells and the breakdown of the connections between them.

The disease is the most common form of dementing illness among middle and older adults, affecting more than 4 million Americans and many millions worldwide. The prevalence of Alzheimer's among adults ages 70-79 in India, however, is 4.4 times less than the rate in the United States.

Widely used as a food dye and preservative, and in some cancer treatments, curcumin has undergone extensive toxicological testing in animals. It also is used extensively in traditional Indian medicine to treat a variety of ailments.

Other members of the research team are Fusheng Yang, Giselle Lim, Aynun Begum, Mychica Simmons, Suren Ambegaokar, Ping Ping Chen of UCLA; Rakez Kyad and Charlie Glabe of the University of California at Irvine; and Sally Frautschy of UCLA and the Greater Los Angeles VA Healthcare System at Sepulveda.

The Alzheimer Disease Research Center at UCLA, directed by Dr. Jeffrey L. Cummings, was established in 1991 by a grant from the National Institute on Aging. Together with grants from the Alzheimer's Disease Research Center of California and the Sidell-Kagan Foundation, the center provides a mechanism for integrating, coordinating and supporting new and ongoing research by established investigators in Alzheimer's disease and aging.

Veterans Affairs Greater Los Angeles Health Care System and Sepulveda Ambulatory Care Center combine resources to form a unified Geriatric Research Education and Clinical Center, one of 20 nationwide. These centers of excellence are designed to improve health care and quality of life to older veterans through the advancement and integration of research, education and clinical achievements in geriatrics and gerontology into the total VA health care system and broader communities.

A copy of the full paper can be found on the Journal of Biological Chemistry Web site at http://www.jbc.org/cgi/content/abstract/M404751200v1?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&fulltext=curcumin&searchid=1103563055202_5944&stored_search=&FIRSTINDEX=0.

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