

Potential Effects of Curcumin on Age-Related Cognitive Decline

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As people age, the risk for cognitive decline increases. By age 65 or older, an estimated 10 percent of the population develops dementia, which interferes with daily activities and independence. By age 85, that risk approaches 50 percent. Genetic research has identified several mutations that rarely cause Alzheimer's disease, the most common cause of dementia, as well as genetic risks that affect the general population. But genetics account for only part of the risk for the average individual, and non-genetic factors involving lifestyle behaviors and modifiable risk factors (e.g., obesity, physical inactivity, stress, nutrition) account for a large proportion of risk for cognitive decline. The latest research indicates that healthy nutritional choices can have an impact on some of the negative brain health consequences of aging. A Mediterranean-style diet is associated with healthier brain aging and includes fruits, vegetables, fish, legumes, and other healthy proteins and fats. Obesity and overweight increase the risk for dementia, while weight reduction can improve memory ability within several months. Consuming antioxidant fruits and vegetables protects the brain from age-related oxidative stress, and anti-inflammatory omega-3 fats from fish, nuts, and flaxseed protect cognitive health from heightened brain inflammation.

Epidemiological research has demonstrated a lower prevalence of Alzheimer's disease in India where residents consume curry and other spicy foods. Compared to the United States, the proportion of people in their seventies with Alzheimer's disease is four times lower than for 70 year-olds in the United States. This observation raised the question of whether ingredients in the spicy foods typically consumed by people in India could account for these differences. Curcumin, a component of curry and other spicy foods, also has been found to combat inflammation and the amyloid plaques and tau tangles that accumulate in the brains of patients with Alzheimer's disease.

Such background studies led our research team to investigate the potential memory benefits of curcumin. Our study was unique in that it was the first controlled human study of a bioavailable form of curcumin in people with mild age-related memory complaints over an 18-month period. Most previous studies of the cognitive effects of curcumin had focused on patients who had dementia, which is a more advanced stage of neurodegeneration. We hypothesized that the spice would have a greater likelihood of a benefit if we tested people with milder conditions. In addition, we thought it would be important to find a form of curcumin that was readily absorbed from the digestive tract into the blood. We thus examined the effects of an easily absorbed curcumin supplement (Theracurmin) on memory performance in people without dementia, as well as curcumin's potential impact on the microscopic plaques and tangles. This double-blind, placebo-controlled study involved 40 adults between the ages of 50 and 90 years who had mild memory complaints. Participants were randomly assigned to receive either a placebo or 90 milligrams of curcumin twice daily for 18 months. All subjects received standardized cognitive assessments at the start of the study and at six-month intervals, and monitoring of curcumin levels in their blood at the start of the study and after 18 months. Thirty of the volunteers underwent positron emission tomography, or PET scans, to determine the levels of amyloid and tau in their brains at the start of the study and after 18 months.

The study volunteers who took curcumin experienced significant improvements in their memory and attention abilities, while those who received placebo did not. In memory tests, the people taking curcumin improved by 28 percent over the 18 months. Those taking curcumin also had mild improvements in mood, and their brain PET scans showed significantly less amyloid and tau signals in the amygdala and hypothalamus – brain regions controlling memory and mood – than those who took placebos. Four people taking curcumin, and two taking placebos, experienced mild side effects such as abdominal pain and nausea. We plan to conduct a follow-up study with a larger number of subjects to confirm these findings, and that study will include some people with mild depression so we can explore whether curcumin also has antidepressant effects. The larger sample also would allow us to analyze whether curcumin's memory-enhancing effects vary according to people's genetic risk for Alzheimer's disease, their age or the extent of their cognitive problems.