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NEWS

RSNA Press Release

Blood Flow to Brain May Be Clue to Certain Dementias

Released: August 30, 2005

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At A Glance

- Patients over age 75 with dementia had a lower rate of blood flow to their brains than same-age seniors with optimal cognitive function.
- Possible causes of low cerebral blood flow include heart failure or a narrowing of brain or neck arteries.
- Changes in cerebral blood flow can be routinely measured by radiologists.

OAK BROOK, Ill.—The amount of blood flowing into the brain may play a larger role in the development of dementia than previously believed, according to a study in the September issue of the journal *Radiology*.

Researchers from Leiden University Medical Center in the Netherlands used magnetic resonance imaging (MRI) to examine the brains of elderly patients with and without dementia related to Alzheimer's or Parkinson's disease. As expected, MR images showed that the patients with late-onset dementia had more brain damage compared with young adults and with seniors who had optimal cognitive function. But researchers found that the late-onset dementia group also had a much lower rate of blood flow to the brain than the other two groups.

"Our findings not only support the hypothesis that vascular factors contribute to dementia in the elderly, they are highly suggestive that a diminished cerebral blood flow indeed causes brain damage," said Aart Spilt, M.D., a Leiden radiology resident and lead author of the study. "This gives us a clue to the genesis of dementia."

Dementia is a loss of cognitive functions, such as thinking, remembering and reasoning, that interferes with normal activities. Although many conditions can produce these symptoms, Alzheimer's disease is the most common cause of dementia. Some patients with Parkinson's disease also develop dementia.

In the Dutch study, researchers examined 17 patients with late-onset dementia (dementia occurring after age 75), another 16 seniors of the same age with optimal cognitive function and 15 healthy younger individuals. Researchers used MRI to measure cerebral blood flow and the extent of structural brain damage in each person and then compared the results of the three groups.

Average total cerebral blood flow in the healthy young individuals was 742 milliliters (mL) per minute. Cerebral blood flow in the two elderly groups averaged 496 mL per minute, or

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246 mL per minute lower than the younger group. In patients with dementia, average cerebral blood flow was 443 mL per minute, or 108 mL per minute lower than seniors of the same age with optimal cognitive function (551 mL per minute).

Although patients with dementia have been shown to require less cerebral blood flow as the brain becomes less active, Dr. Spilt's research provides some evidence that the decreased blood flow may lead to some types of dementia.

"The findings emphasize the importance of monitoring both high and low blood pressure in older adults," Dr. Spilt said. "Possible causes of low cerebral blood flow include heart failure and a narrowing of cerebral or cervical arteries."

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Radiology is a monthly scientific journal devoted to clinical radiology and allied sciences. The journal is edited by Anthony V. Proto, M.D., School of Medicine, Virginia Commonwealth University, Richmond, Va. *Radiology* is owned and published by the Radiological Society of North America, Inc. (radiology.rsna.org)

The Radiological Society of North America (RSNA) is an association of more than 37,000 radiologists, radiation oncologists and related scientists committed to promoting excellence in radiology through education and by fostering research, with the ultimate goal of improving patient care. The Society is based in Oak Brook, Ill. (RSNA.org)

"Late-Onset Dementia: Structural Brain Damage and Total Cerebral Blood Flow." Annelies W.E. Weverling-Rijnsburger, M.D., Huub A.M. Middelkoop, Ph.D., Wiesje M. van der Flier, Ph.D., Jacobijn Gussekloo, M.D., Anton J.M. de Craen, Ph.D., Eduard L.E.M. Bollen, M.D., Gerard J. Blauw, M.D., Mark A. van Buchem, M.D., and Rudi G.J. Westendorp, M.D., collaborated with Dr. Spilt on this paper.

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