an Ounce of Prevention

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PREVENTION HIGHLIGHT

Diabetes and Cognitive Impairment

It is now well known that diabetes, also known as diabetes mellitus, causes cognitive impairment. Approximately 100 million people in the USA have either diabetes or pre-diabetes. The most common form of diabetes, type 2 diabetes, causes cognitive impairment in a number of ways. Diagnosis of cognitive impairment due to diabetes, followed by proper treatment, is essential to minimize disability.

Type 2 diabetes increases risk of cognitive impairment due to Alzheimer's Disease (AD) and cerebrovascular disease (CVD) by 1.7-fold and 1.6-fold respectively. Diabetic patients most likely to develop cognitive impairment include those who: 1) are not receiving diabetes treatment; 2) are insulin resistant; or 3) have longer duration of symptoms or greater disease severity.

The mechanism by which diabetes increases risk for AD involves the control of brain levels of insulin. Most brain insulin comes from the pancreas and is transported through the blood to the brain via Insulin Growth Factor-1 (IGF-1) receptors. In AD, there are reduced levels of IGF-1 and its receptors in both blood and brain, which leads to reduced brain insulin levels. There is evidence that reduced brain levels of insulin or IGF-1 decrease beta amyloid removal, and can accelerate progression of AD pathology (elevated brain beta amyloid levels are the primary cause of AD). Reduced insulin or IGF-1 brain levels also reduce the brain neurotransmitter, acetylcholine, (acetylcholine helps memory and other cognitive abilities). The clinical relevance of these findings is supported by intra-nasal IGF-1 inhalation studies in humans, which have been shown to improve their memory. Furthermore, IGF-I levels below 9.4 nmol/liter predict greater cognitive decline over three years (slowing of brain information processing speed).

Subtle changes in cognition, known as mild cognitive impairment, which precede the dementia stage, are related to abnormal glucose control. Blood levels of Hemoglobin A1c (HbA1c) are a useful measure of long-term glucose control. HbA1c levels above 7% significantly increase the risk of mild cognitive impairment or dementia in both diabetics and non-diabetics. Also, blood glucose levels above 180 mg/dl or below 135 mg/dl in diabetics increase risk of mild cognitive impairment or dementia.

Recommendations for managing cognitive impairment and diabetes.

Fasting plasma glucose and HbA1c blood levels should be measured and monitored in elderly patients, in AD patients, in postmenopausal women with osteoporosis and in diabetic patients, or in patients with these diabetes risk factors:

- HbA1c levels above 7% should be evaluated for diabetes and treated
- Abnormal fasting glucose levels should be evaluated and treated

Homocysteine blood levels should be monitored annually to keep them below 10.

Assess for cognitive impairment every 6-12 months:
- when indicated by the lab test parameters listed above;
- in subjects reporting cognitive decline in memory/other cognitive abilities;
- in untreated diabetics;
- in diabetics with duration since symptom onset of 10 or more years;
- in diabetics with any diabetic complications (e.g., neuropathy, nephropathy, retinopathy, myopathy, etc.)

To evaluate mild cognitive impairment, tests of working and short-term memory are recommended. This can be accomplished by:

- A neuropsychologist recommended by your physician.
- The MCI Screen test offered by Medical Care Corporation, which has published accuracy of 97% for differentiating normal aging from mild cognitive impairment.

RESEARCH UPDATES

High IQ May Prevent Dementia

Researchers have found that individuals who had higher than average intelligence or participated in a lot of extracurricular activities as high school students were less likely to develop dementia by the time they reached their 70s. This study supports the "reserve" theory of brain aging which suggests that brain activity and intelligence develop a greater network of interconnections. Brains with higher degree of interconnections withstand higher degree of brain damage before developing dementia. In the study, published in Journal of American Geriatrics Society, researchers evaluated intelligence and activity levels during high school in 400 men and women who graduated from the same high school in the 1940's. Those with higher than average IQ were about half as likely to have dementia by their mid-70's. Those who participated in two or more activities per year had a third lower risk of dementia compared to those who participated in fewer activities per year.

Depression in Individuals Younger than 65 Increases Risk of Stroke

A recent study published in the January issue of Stroke found that those under the age of 65 with symptoms of depression appear to have increased risk of stroke (ischemic stroke or transient ischemic attacks). However, the risk was not seen in individuals older than 65. Dr. Francisco Javier Carod-Artal and colleagues at Sarah Hospital in Brasilia, Brazil, followed 4120 subjects of the Framingham Heart Study aged 29-100. Subjects who were stroke free were followed for 8 years. Using a depression scale, 10.7% of participants were identified as having depressive symptoms. Among subjects aged 65 or younger, those with depression symptoms were 4 times as likely to have a stroke when compared with the rest of the

individuals in the study. However, a correlation between depression and risk of stroke was not identified.

Older Adults Who Exercise May Lower the Risk of Developing Dementia

Seniors who exercised at least three times a week had a 30-40% lower risk of developing dementia compared with seniors exercising less often. Even modest amounts of gentle exercise, such as walking for 15 minutes three times a week, benefited subjects. Dr. Eric Larson, director of Group Health Cooperative of Seattle's Center for Health Studies, lead the study which was published in January issue of Annals of Internal Medicine. 1,750 people aged 65 and older, were followed for 6.2 years on average. During the course of the study, 158 developed dementia and 107 were diagnosed with Alzheimer's disease. Researchers periodically assessed how much each individual was exercising. The rate of dementia for those who exercised three or more times per week was 13 for each 1,000 persons; for those who exercised less the rate was 19.7.