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Link between diabetes and cognitive impairment

Clinical experience and multiple research studies suggest that persons with diabetes are more likely to develop cognitive impairment or frank dementia which may be Alzheimer's type or vascular dementia. Initially this may be subtle and manifest itself as mental slowing or apathy. On the other hand, patients with Alzheimer's disease have an increased risk of developing Type 2 diabetes. What both these groups have in common is advanced age, a genetic predisposition, and comparable pathological features in the pancreatic islets and the brain, namely amyloid derived from amyloid B protein in the brain of Alzheimer's disease and islet amyloid derived from islet amyloid polypeptide in the pancreas in Type 2 diabetes.

A study of subjects from the Mayo Clinic Alzheimer Disease Patient Registry found that both Type 2 Diabetes (35% vs. 18%; $P < 0.05$), and impaired fasting glucose (46% vs. 24%; $P < 0.01$) were more prevalent in Alzheimer disease versus non-Alzheimer disease control subjects. Hence 81% of cases of Alzheimer disease had either Type 2 diabetes or IFG. In selected subjects in whom autopsy data was available, islet cell amyloid was more frequent and extensive in patients with Alzheimer disease than the non-Alzheimer disease controls. However diffuse neuritic plaques were not more common in patients with Type 2 diabetes than in control subjects.

The Honolulu-Asia aging study investigated the effects of brain aging in very old men of Japanese -American descent born between 1900 and 1919 utilizing MRI. The prevalence of diabetes in this cohort was 38% and subjects with Type 2 diabetes had a moderately increased risk of lacunes (small brain infarcts) (odds ratio (OR)1.6) and atrophy of the hippocampus(OR 1.7). Those with a longer history of diabetes, those taking insulin and those with complications, had more common pathological changes commonly seen in dementia.

The development of dementia and even depression will adversely affect overall health and diabetes management in particular. Managing complex medication regimens including multiple injections of insulin or glucagon-like peptide 1 agonists will become problematic and may result in severe hypo or hyperglycemia. Memory impairment, executive dysfunction and functional impairment that accompanied neurodegenerative processes will lead to poor food choices, and meal preparation, as well as difficulty in glucose monitoring.

Biography

Naushira Pandya, MD, CMD is Professor and Chair of the department of Geriatrics at Nova Southeastern University College of Osteopathic Medicine, and the Project Director of the Geriatrics Education Center. In addition, she is medical director of two facilities. She has chaired several AMDA clinical practice guidelines and published in the area of diabetes and anemia. Pandya is on the editorial board of JAMDA and a Fulbright scholar as well as speaker at national and international meetings. She is board certified in internal medicine, geriatrics, and endocrinology.

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