

Long-Term Obesity in Women Linked to Brain Tissue Loss, Cognitive Decline

Obese women are more likely to lose brain tissue, which has been linked to cognitive decline, according to a new study.

Investigators reporting in *Neurology* studied the relationship between body mass index (BMI) and brain atrophy in 290 women born between 1908 and 1922. Four follow-up examinations occurred between 1968 and 1992.

Women had a computed tomography scan to measure for brain tissue loss. Investigators found that the BMI of overweight or obese women was linked to tissue loss in the temporal lobe. According to investigators, 144 of the women had an average BMI of 27 kg/m² and were labeled as having temporal atrophy. This was 1.1 to 1.5 kg/m² higher than in women without brain atrophy.

Investigators also reported a BMI increase over the 24-year period, and there was a greater increase in individuals with temporal lobe brain tissue loss. Their risk of atrophy was also increased between 13% and 16% per 1 kg/m².

"This study indicates that a high BMI is a risk factor for dementia in women," said Deborah Gustafson, PhD, from the Medical College of Wisconsin and the Sahlgrenska University Hospital in Goteborg, Sweden, in a news release. "Obesity is another factor that should be actively intervened upon to reduce diseases of advanced aging."

The investigators did not pinpoint why obesity leads to brain atrophy. They hypothesized that increased cortisol secretion, and the increased risks of ischemia, hypertension and cerebrovascular and cardiovascular diseases (CVD) may lead to atrophy.

Heel Pain Contributes to Obesity Epidemic

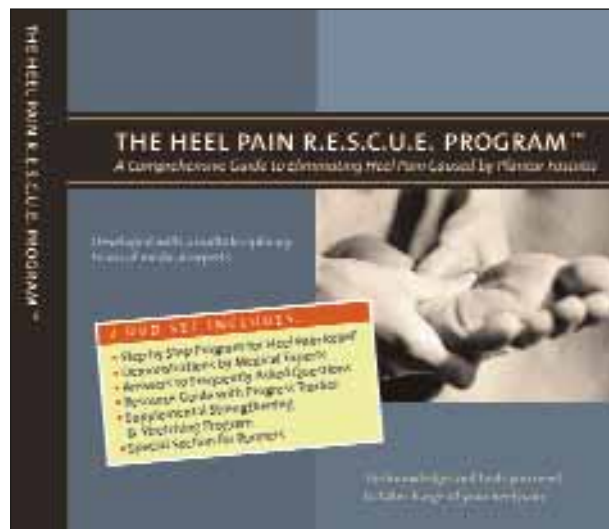
About one-third of obese people in the United States have plantar fasciitis-caused heel pain, which can limit their ability to exercise.

According to a study published in *The New England Journal of Medicine*, 90% of the study population, 381 adults, were limited to exercising once or twice a week due to heel pain.

"This pattern of obesity and heel pain is a vicious cycle," said David Nader, exercise physiologist and member of the Heeling Solutions team, in a news release. "You often find people who are overweight suffering from heel pain due to the added stress on their feet. This pain makes it very difficult to exercise, which in turn can make it almost impossible to lose weight."

According to Heeling Solutions, people who are overweight have a 30% greater chance of having heel pain than those who are not overweight. Wearing proper footwear or arch supports, stretching or other forms of low risk interventions can treat plantar fasciitis.

"Plantar fasciitis is a disease where patient education and lifestyle changes are critical and can make a big difference for a lot of people," said Jeffrey Peterson, MD, in a news release. "When heel pain is resolved, it helps a person to lose weight by enabling a more active, healthy lifestyle."



Obesity in US Has Risen Over Last 10 Years

American workers of all ages have experienced a 9% increase in obesity rates in a decade, according to a study published in the *Journal of Occupational and Environmental Medicine*.

This has led to serious repercussion in the work place and a demand for solutions, investigators from Pfizer Inc, said. The study, "Impact of Obesity on Work Limitations and Cardiovascular Risk Factors in the United States Workforce," documented obesity across the United States work force, which included 140 million people aged ≥ 20 and studied the health data available between 1988 and 2000.

"This study demonstrates unequivocally what happens when workers gain girth, both in terms of their ability to work and the impact on their own health," said Robin Hertz, PhD, Pfizer senior director of population studies, and author of the study, in a news release. "The damage caused by obesity is clear – employers face growing costs for insurance premiums, as well as lost productivity, and employees face serious work and health concerns."

Investigators wrote that obesity is equivalent to the effects of 20 years of aging on a person's ability to work. Furthermore, 7% of obese workers and 3% of normal weight workers are likely to report they are limited in the amount or kind of work they can handle due to physical, mental or emotional problems. Investigators also found that obese employees are also less productive because of other reasons like not being able to work as many hours or having limited abilities when reporting to work.

Correlations between obesity and CVD risk factors were also identified. Specifically, obese employees had higher prevalence of risk factors including hypertension, type 2 diabetes, dyslipidemia and metabolic syndrome.

"By pointing out the relationship between obesity and serious risk factors for [CVD] ... the study identifies opportunities for intervention to improve health. While we try to address obesity in the workplace, we can also target these cardiovascular risk factors as another avenue for improving the health of obese and overweight employees," said Dr. Hertz, who pointed out that 59% of younger workers, 68% of middle-aged workers and 77% of older workers are overweight or obese.

Vitamin D's Affect on Diabetic Patients Varies by Ethnicity

Non-Hispanic blacks have a decreased sensitivity to vitamin D versus non-Hispanic whites and Mexican-Americans, who have an inverse relationship to vitamin D. This inverse relationship may indicate a resistance to insulin.

Investigators from the University of Auckland, New Zealand, the University of Michigan and Deakin University, Australia analyzed 25-hydroxyvitamin D (25OHD) serum levels in over 6,000 people who were enrolled in the Third National Health and Nutrition Examination Survey (1988-1994) (NHANES III). These serum levels reflect the status of vitamin D in the body.

All patients were aged ≥ 20 years. There were 2,766 non-Hispanic whites, 1,736 non-Hispanic blacks and 1,726 Mexican-Americans enrolled. Investigators noted an inverse relationship between non-Hispanic whites or Mexican-Americans and insulin resistance, however, this relationship was not seen among non-Hispanic blacks.

After adjustments were made for sex, age, BMI, leisure activity and quarter of the year, the "ethnicity-specific odds ratios for diabetes (fasting glucose ≥ 7 mmol/L) varied inversely across quartiles of 25OHD in a dose-dependent pattern," they wrote. The odds ratio for non-Hispanic whites was 0.25, (95% CI 0.11-0.60), and in Mexican-Americans, it was 0.17 (0.08-0.37). These ratios were 25OHD ≥ 81 nmol/L in the highest quartile and ≤ 43.9 nmol/L in the lowest.

Diabetes Rates Higher Along the US-Mexico Border

People living along the border of the United States and Mexico have higher rates of diabetes. More people are overweight or obese than US and Mexican national averages, according to a survey of 4,000 people.

The survey was conducted by the Centers for Disease Control and Prevention (CDC), Mexico Secretariat of Health and the Pan American Health Organization (PAHO). It was comprised of 88% Hispanics, and concluded that nearly 16% of people who live along the border have type 2 diabetes. The national average is 13.9% in the United States and 14.9% in Mexico.

This is the first survey that grouped the border area as one epidemiological unit. Investigators looked at the prevalence of diabetes, prediabetes, overweight and obe-

sity in California, Arizona, New Mexico, Texas and six Mexican states.

Seventy-four percent of women who live along the border are either obese or overweight, said Joxel Garcia, MD, PAHO deputy director, in a news release. Seventy percent of the men are also obese or overweight. Approximately 13.9% of this population has prediabetes.

"We were underestimating the amount of diabetes we have here and the amount of obesity and overweight that we have here," Dr. Garcia said. "Inadequate diets with too much fat, lack of exercise and low awareness of the health risks contribute to the problem."

The US-Mexican border region, a 2,000-mile band, is home to 8 million residents. Health officials estimate that 1.2 million residents of this area have type 2 diabetes. About 700,000 reside in the United States. In addition, 4.3 million adults in this area are either overweight or obese.

A joint project to reduce the impact of diabetes among border residents is under way.

Walnuts May Lower LDL in Type 2 Diabetic Patients

A whole foods diet containing walnuts may reduce LDL cholesterol by 10% in type 2 diabetic patients, according to a study published in *Diabetes Care*.

Investigators found that walnuts, which are rich in polyunsaturated fats, omega oils and vitamins, are an effective way to address insulin resistance in patients with early type 2 diabetes.



Individual, 6-month diet plans were developed for 60 patients. They were based on the core food groups of cereals and breads, fruit and vegetables, lean meat, fish, low-fat dairy products, oils, avocados, peanut butter and nuts. Each diet included eight to 10 walnuts (30g) a day.

"This is one of the first studies to look at the effect

of polyunsaturated fatty acids on diabetes management," said Linda Tapsell, PhD, lead author, and director of the National Centre of Excellence in Functional Foods, University of Wollongong, Australia, in a news release. "Walnuts are an easy and convenient way of getting polyunsaturated omega-3 fatty acids into the diet. And, they are particularly important for people with diabetes because they're a simple snack food, which is an integral component of managing the diet in diabetes."

Investigators concluded that eating walnuts improved HDL cholesterol and helped to put the right fats into the diets of type 2 diabetic patients.

CVD Risk Increases with Excess Vitamin C Intake

Postmenopausal women with diabetes were at an increased risk of mortality from CVD when they followed a diet with high vitamin C intake.

According to investigators reporting in *The American Journal of Clinical Nutrition* who studied vitamin C and its relationship to the mortality rates of CVD, coronary artery disease (CAD) and stroke, the adjusted relative risk for total cardiovascular mortality were 1.0, 0.97, 1.11, 1.47 and 1.84 (*P* for trend <.01) for total vitamin C intake from food and supplements. The population consisted of postmenopausal women with diabetes.

Investigators reported an adjusted relative risk of CAD as 1.0, 0.52, 1.23, 2.22 and 2.57 (*P* for trend <.01), and noted that supplemental vitamin C was positively associated with mortality endpoints. Intake of vitamin C was not related to CVD mortality in those patients without diabetes.

Of the 1,923 women followed for 15 years, 281 died from CVD; 174 from CAD and 57 from stroke. None of the patients had CAD at the start of the study.

Mild, Moderate Alcohol Consumption Beneficial

Drinking beer or wine in moderation may actually ward off the metabolic syndrome, according to investigators reporting in *Diabetes Care*.

Investigators used a population of 8,125 patients from NHANES III who consumed at least one alcoholic drink per month. National Cholesterol Education Program criteria were used to evaluate patients for the

metabolic syndrome – specifically fasting insulin and alcohol consumption.

In patients whose monthly consumption was between one and 19 drinks, a 0.65 prevalence of the metabolic syndrome was present versus nondrinkers ($P < .05$). In patients who had ≥ 20 drinks each month, the prevalence was 0.34.

These statistics reflect adjustments for age, sex, ethnicity, education, income, tobacco use, physical activity and diet. When the drinks were either wine or beer, findings were “particularly noteworthy,” the investigators wrote.

Across ethnicities, prevalence of the metabolic syndrome was consistent in patients who drank ≥ 20 drinks/month. However, there was no association in white men or women, they wrote (OR 0.35 and 0.22 respectively, $P < .05$).

Investigators concluded that the mild or moderate consumption of alcohol may positively influence characteristics of the metabolic syndrome that include lipid levels, waist circumference and rates of fasting insulin. They noted that this relationship was the most prevalent among whites and beer and wine drinkers.

This study presents controversial information about the presence of the metabolic syndrome in relationship to alcohol.

To read a study with conflicting data, please see the Conference Coverage brief from the 2004 Annual Meeting of the American Heart Association on page 44.

Chromium May Improve Insulin, Glucose Function

A literature review of over 40 clinical trials revealed that using chromium in type 2 diabetic patients may improve insulin function and glucose metabolism.

William Cefalu, MD, chief of the division of nutrition and chronic disease at the Pennington BioMedical Research Center, Louisiana State University System; Frank B. Hu, MD, PhD, Harvard School of Public Health; and colleagues reported their findings in *Diabetes Care*.

According to the investigators, chromium did not have toxic effects on patients as long as they stayed under 1,000 $\mu\text{g}/\text{day}$ and for periods not exceeding 64 months.

“Growing evidence suggests that chromium supplementation, particularly in the form of chromium picolinate, may improve insulin sensitivity by potentiating the action of insulin to stimulate glucose transport into cells,” Dr. Cefalu said in a news release. He presented the study findings at the VII International Society of Trace Element Research in Humans in Bangkok.

Public Unaware of Type 2 Diabetes' Consequences

People think that type 2 diabetes ranks sixth among the seven medical factors that contribute to the risk of heart disease, a study from the National Lipid Association's (NLA) revealed. According to the NLA, however, people with diabetes are four times more likely to develop heart disease versus people without diabetes.

Other survey results showed that people did not understand the impact of dyslipidemia on type 2 diabetes, nor did they know that people with type 2 diabetes have lower HDL cholesterol levels versus nondiabetic people.

Consumers ranked cholesterol as the second to last concern of diabetic treatment regimens. The majority of consumers mentioned glucose monitoring, controlling sugar intake, regular exercise and smoking cessation as major concerns.

“As we know, elevated cholesterol and type 2 diabetes are major risk factors for heart disease independent of each other,” said John Guyton, president of the NLA, in a news release. “However, when these two conditions are found in the same person, the risk of heart disease increases four or more times. The NLA is seeking to promote awareness and encourage patients to talk with their doctors about the importance of routine cholesterol management as part of any diabetes treatment regimen.”

Genetics of Type 1 Diabetes Unclear, Under Investigation

It is unclear how type 1 diabetes is triggered in children with a genetic risk, however, according to the American Diabetes Association, only one in 30 children with a predisposition for diabetes develop the disease.

Investigators from the Pacific Northwest Research Institute (PNRI), Seattle, are joining investigators from medical centers in Florida, Georgia, Colorado, Germany, Finland and Sweden to study 8,000 children who are at high risk for type 1 diabetes. Investigators will follow patients for 15 years and study possible prevention methods and diabetic treatments.

“We hope to identify at least a few, and hopefully as many as a dozen, exposure (triggers) that are avoidable,” said Bill Hagopian, MD, principal scientist at PNRI and director of the Seattle portion of the research, in a news release.

The research is funded by a \$35 million grant from the National Institute of Digestive and Diabetes and Kidney

Diseases, and is called TEDDY – The Environmental Determinants of Diabetes in the Young. Investigators have gathered over 44,000 infant blood tests, and hope to identify 1,200 infants with HLA-DQ, a genetic marker that puts them at risk for diabetes.

Children will be followed through their teens to locate possible triggers of type 1 diabetes. Investigators will regularly collect blood, stool and toenail samples. Home tap water samples will also be analyzed. Detailed records of vaccinations, exposure to pesticides, the presence of pets in the home, and when the child first consumed certain foods will also be studied.

Dr. Hagopian said that the large sampling of children will help investigators to identify certain outside influences that increase the risk of type 1 diabetes at least twofold. “We want to look mainly at prevention,” he said in the news release. “It’s easier to prevent a disease than to cure it.”

Hyperglycemia Slows Mental Functions

The ability for diabetic people to think quickly and solve problems is harder during a spike in their blood glucose level, according to a study in *Diabetes Care*.

Signs of cognitive slowing and errors on math and verbal tests occurred in 55% of type 1 and 2 diabetic patients during hyperglycemia, investigators from the University of Virginia Health System (UVHS) wrote, noting that this indicated the effects of hyperglycemia vary between individuals.

Patients experienced a consistent deterioration in cognitive function resulting from an increased blood sugar that reached or exceeded 15 mmol/L or 270 mg/dL, the investigators wrote.

“The best way to minimize any negative effects on cognitive functioning is to keep blood glucose levels tightly controlled,” said lead investigator Daniel J. Cox, MD, of the UVHS Center for Behavioral Medicine Research, in a news release. “People who have diabetes should pay careful attention to the warning signs of hyperglycemia so that they can quickly take action to treat it.”

Depression, Anxiety High Among Diabetic Patients

According to a CDC study, diabetic patients are two times more likely than nondiabetic patients to have serious psychological distress (SPD). Patients with both

conditions are more likely to live in poverty.

Researchers from the New York City Department of Health and Mental Hygiene surveyed 9,590 New York City residents aged ≥ 18 years to address the prevalence and effects of SPD among diabetic patients.

According to *Morbidity and Mortality Weekly Report*, 498 people surveyed over the telephone had SPD – 80 had diabetes. The prevalence of SPD was 10.4% among diabetic patients (CI = 7.3-14.7). Investigators, who controlled statistics for age, sex, ethnicity, marital status and household income, reported a twofold increase in SPD across the diabetic population.

In addition to living in poverty, diabetic patients with SPD were also more likely to report poor health, have poor access to health care and to lose a spouse or partner to divorce, separation or death.

Investigators found that 48.7% of patients who had both diabetes and SPD were divorced, separated or widowed, and 70.2% had a household income $< \$25,000$. A total of 25.3% of patients with only diabetes were divorced, separated or widowed, and 42.8% had a household income $< \$25,000$. See *related article on page 13*.

LEAD Study Evaluated Toe Blood Pressure

Including assessments of toe blood pressure and toe/arm blood pressure index may help detect lower extremity arterial disease (LEAD) in diabetic patients.

These assessments may detect signs of impaired arterial circulation in up to 30% of diabetic patients who do not have ischemic symptoms, investigators reporting in *Angiology* wrote in their evaluation of a LEAD screening program at two university hospitals.

A total of 437 patients, aged 30 to 70 years with no history of LEAD, were followed for 10 years in the longitudinal study. Blood pressure screenings for peripheral circulation of the arm, ankle and toe were taken in 166 type 1 diabetic patients, 137 type 2 diabetic patients and control group. Patients underwent a physical examination and were evaluated for peripheral neuropathy.

Investigators found more peripheral pressures and indices below normal in both of the diabetic groups ($<$ mean -2 SD for controls). They also detected low toe or ankle blood pressure, toe/arm index ankle/arm index in at least one limb of 24% of type 1 diabetic patients and 31% of type 2 diabetic patients. This was compared to 6% in the control group.

Low blood pressure and index levels were negatively associated with fasting blood glucose in all patients. There was a negative association between the levels and smoking, age and diabetes duration in type 1 diabetic patients, the investigators wrote.

Signs of Albuminuria Present at Onset of Diabetes

The presence of albuminuria is found in both diabetic and prediabetic patients and worsens with glucose intolerance.

In an Australian study of 11,247 adults aged ≥ 25 years, investigators studied the relationship between albuminuria and glucose tolerance. A total of 25.3% of diabetic patients had either micro- or macroalbuminuria. They reported their findings in the *American Journal of Kidney Disease*.

As normal and impaired fasting glucose (IFG) increased, so did the prevalence of albuminuria, investigators wrote. A prevalence of 5.1% was present with normal glucose tolerance; it was 9.3% with IFG and 11% with impaired glucose tolerance. Investigators noted that diabetic patients had an albuminuria presence of 32.6%.

The risk of albuminuria was higher in patients with either known or newly diagnosed diabetes who had IFG versus patients with normal glucose function. Investigators found this to be true regardless of age, sex or other known albuminuria risk factors.

Therapeutic Approach to Diabetic Retinopathy

Using triamcinolone acetonide (Bristol-Myers Squibb) as a treatment for advanced diabetic retinopathy (DR) or diabetic macular edema (DME) provided temporary improvement, according to a study in *Ophthalmology*.

Investigators, who wrote that the overproduction of insulin-like growth factor 1 and growth hormone are important factors in the pathogenesis of DR, said that targeting somatostatin receptors with somatostatin analogues is a treatment for DR. The drug, a somatostatin analogue, was shown to be safe and effective in treating DR and DME, they wrote.

"One important pathomechanism in the development of diabetic complications is the activation of protein kinase C [PKC] induced by high glucose due to an increased diacylglycerol level," they wrote.

Investigators noted that intraocular pressure, cataracts or endophthalmitis were possible side effects.

Prospective clinical studies are ongoing, the investigators wrote. These studies are testing whether specific PKCs inhibitors prevent the progression of DR or DME.

High Lipid Levels May Signal Macular Edema

Type 1 diabetic patients with high serum lipid levels may be at an increased risk of clinically significant macular edema (CSME) and hardening of retinal exudates, according to a study published in *Diabetes*.

The study population included 1,441 type 1 diabetic patients from the Diabetes Control and Complications Trial. Their serum lipid levels were evaluated in relation to DR endpoints that included CSME and hard exudates.

Using the proportional hazards regression model, investigators studied the total lipid levels, LDL and HDL cholesterol levels, the total-to-HDL cholesterol ratio and triglycerides in relation to CSME, hard exudates, DR progression and proliferative DR.

Because serum lipid levels that are higher than normal may cause CSME or retinal hard exudate, investigators concluded that treatment lowering lipid levels may decrease the risk of CSME among type 1 diabetic patients.

Impaired Pulmonary Function May Predict Diabetes

Restrictive, but not obstructive lung disease, was associated with an increased risk for diabetes, according to investigators reporting in *Diabetes Care*.

A total of 4,830 US men and women that were enrolled in the NHANES Follow-up Study were followed from 1992 to 1993, and diabetes was determined in 443 of them. The patients were between the ages of 25 and 74 years.

Although investigators said that more evidence is needed about the possibility of impaired pulmonary function as a predictor for diabetes, they concluded that restrictive lung disease (hazard ratio=1.45, 95% CI 1.04-2.03) did have an association with the incidence of diabetes, and this association was seen in both nonsmokers and smokers. ■