

# In This Issue of *Diabetes Care*

Edited by Helaine E. Resnick, PhD, MPH

## Smoking Reduces Risk of Type 1 Diabetes

New data from a cohort of more than 90,000 adults show that smoking is associated with increased risk of type 2 diabetes in overweight men, but that it decreases risk of autoimmune diabetes across the board. Smoking is a modifiable risk factor whose impact on cardiovascular disease is indisputable, and for which there is ample evidence of increased risk of type 2 diabetes. This issue of *Diabetes Care* (p. 604) features new data that demonstrate a protective effect of smoking on risk of autoimmune diabetes. The new report analyzes data from the HUNT study—a large, longitudinal study of Norwegian adults that was conducted between 1984 and 2008. Investigators documented smoking habits and ascertained incident diabetes in 90,819 participants with a mean age of ~50 years at baseline, and of whom ~30% were current smokers. Blood samples of participants who developed diabetes were analyzed for glucose, C-peptide, and antibodies to GADA. These measures, along with age of diabetes onset, were used to distinguish type 2 from autoimmune diabetes. These determinations, when analyzed in relation to the smoking data, highlighted several key findings: Heavy smoking was associated with higher rates of type 2 diabetes in the cohort as a whole—an observation that was driven primarily by the link between smoking and type 2 diabetes in overweight men. In this group, there was a trend of increasing type 2 diabetes risk with increasing pack-years of smoking exposure. In contrast, data from the same cohort showed that smoking was associated with a reduced risk of autoimmune diabetes. The risk of autoimmune diabetes was reduced by 48% in current smokers and 58% in heavy smokers, and risk reductions applied to both normal-weight and obese participants. Further, smokers had decreased GADA and increased C-peptide. The authors suggest that these data are consistent with the idea that smoking inhibits autoimmune activity. — *Shulamit Babitz*

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Rasouli et al. Smoking is associated with reduced risk of autoimmune diabetes in adults contrasting with increased risk in overweight men with type 2 diabetes: a 22-year follow-up of the HUNT study. *Diabetes Care* 2013;36:604–610

## Adenovirus Infection Linked With Obesity and Glycemic Control in Humans

New data suggest that although people with a common adenovirus infection are heavier, they have less deterioration in glucose control over time. This issue of *Diabetes Care* (p. 701) presents a study exploring the longitudinal relationship of Ad36, a human adenovirus with a prevalence of ~15% in the U.S., and measures of adiposity and glycemic control. In animal studies, Ad36 increases adiposity, but, paradoxically, it has been associated with improved glycemic control. Cross-sectional studies in humans have also shown that greater adiposity and more favorable glycemic control are associated with Ad36 seropositivity. The new study by Lin et al. uses data from the San Antonio Family Heart Study to examine these factors in 1,400 Hispanic adults with and without Ad36 infection. The investigators contrasted baseline data on body weight, body fat, fasting glucose, and insulin levels with similar information collected 10 years later. A variety of cross-sectional and longitudinal analyses were conducted that yielded a general conclusion that Ad36 seropositivity was associated with greater adiposity and less deterioration in glycemic control during the follow-up period. The report showed that seropositive individuals had higher percentages of body fat, coupled with lower fasting insulin. Importantly, when the data were analyzed according to BMI category, a number of strata-specific differences emerged that suggested the need for additional study. Nonetheless, taken together, these data build on a body of evidence suggesting that Ad36 infection may interact with various metabolic pathways in a manner that impacts the risk for obesity and diabetes. If this is the case, these findings may lead the way to developing new approaches for prevention and treatment. — *Shulamit Babitz*

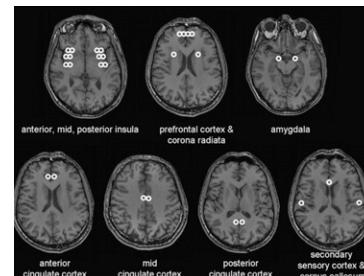
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Lin et al. Long-term changes in adiposity and glycemic control are associated with past adenovirus infection. *Diabetes Care* 2013;36:701–707

### Brain Microstructure May Influence Gastrointestinal Symptoms in Diabetic Autonomic Neuropathy

The organization of tissue in key areas of the brain may be related to bloating, gastroparesis, and other symptoms that are common among people with diabetic autonomic neuropathy. A new study in this issue of *Diabetes Care* (p. 662) explores the connection between gastrointestinal symptoms and microstructural changes in areas of the brain related to visceral sensory processing. Using MRI and diffusion tensor imaging, Frøkjær et al. assessed brain microstructure in 26 patients with both longstanding diabetes and gastrointestinal symptoms and contrasted these data with information from 23 control subjects. Several parameters, including the organization of fibers, were measured in the sensory matrix and in the corpus callosum section of the brain. The authors found reduced microstructural tissue organization in numerous regions. These changes were associated with a variety of clinical characteristics in the diabetic group, including bloating and subjective well-being. Similar associations were noted for gastroparesis and autonomic dysfunction. The investigators speculate that changes in the brain may contribute to development of the gastrointestinal symptoms that are commonly observed in diabetes, although they acknowledge that these observations may also be partly due to generalized changes that occur in the brain in response to diabetes. The potential functional significance of these microstructural changes suggests that this line of investigation may lead to improved understanding of the origins of common gastrointestinal symptoms and perhaps development of novel treatments.

— Shulamit Babitz



Anatomical magnetic resonance images illustrating the analyzed areas involved in the visceral sensory processing and in corpus callosum

Frøkjær et al. Altered brain microstructure assessed by diffusion tensor imaging in patients with diabetes and gastrointestinal symptoms. *Diabetes Care* 2013;36:662–668

### Selective Screening for Gestational Diabetes Mellitus May Miss One-Third of Patients

New research suggests that selective screening for gestational diabetes mellitus (GDM) may fail to identify more than one-third of women with GDM. Using data from nearly 19,000 deliveries, a study in this issue of *Diabetes Care* (p. 598) evaluated GDM screening recommendations that were recently published by a GDM consensus panel. These recommendations suggest limiting universal screening for GDM in favor of selectively screening only those women with at least one GDM risk factor. These risk factors include maternal age of  $\geq 35$  years, BMI  $\geq 25$  kg/m<sup>2</sup>, family history of diabetes, GDM in a previous pregnancy, or delivery of a newborn with macrosomia. Cosson et al. showed that compliance with the selective screening recommendations missed about one-third of the GDM cases in their study population. They demonstrated that of the 18,775 nondiabetic women with complete risk factor information, 10,975 had one or more risk factors and 2,710 had GDM. Of the women with GDM, only 1,170 (65.3%) had one of the risk factors that the consensus panel recommended should indicate the need for screening. Although the study confirmed that a large proportion of women with at least one risk factor will screen positive for GDM under the selective screening recommendation, 34.7%—about one-third—of women with GDM did not have any of the risk factors that would have resulted in GDM screening. As a result, these women would not have been identified under the selective screening approach, and their GDM would not have been identified. This study also showed that women with GDM but no risk factors—those who would not have been identified under selective screening—had more GDM-related events than their non-GDM counterparts. This suggested that identification of these patients would facilitate opportunities to intervene and prevent unfavorable outcomes. Although the authors acknowledge that the high prevalence of GDM may be related to the populations evaluated in their study, they argue that universal screening is preferable to selective screening because of the less favorable prognosis among women with GDM, including those with no risk factors. — Shulamit Babitz

Cosson et al. Diagnostic and prognostic performances over 9 years of a selective screening strategy for gestational diabetes mellitus in a cohort of 18,775 subjects. *Diabetes Care* 2013;36:598–603

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