

## JOURNAL WATCH

Our panel of experts highlight the most important research articles across the spectrum of topics relevant to the field of diabetes management

**Expert panel:** Dominique Hansen, Hasselt University, Faculty of Medicine, Belgium; Preethi Yerram, University of Missouri, Columbia, MO, USA; Pranav Dalal, University of Missouri, Columbia, MO, USA; Adam Whaley-Connell, University of Missouri, Columbia, MO, USA

**Djoussé L, Driver JA, Gaziano JM, Buring JE, Lee IM. Association between modifiable lifestyle factors and residual lifetime risk of diabetes. *Nutr. Metab. Cardiovasc. Dis.* doi:10.1016/j.numecd.2011.08.002 (2011) (Epub ahead of print).**

While clinical trials have reported beneficial effects of diet, exercise and body weight loss on the risk for developing type 2 diabetes in subjects with obesity and/or glucose intolerance, little is known about the incremental benefit of not smoking and moderate drinking on diabetes risk. In prospective cohorts involving 20,915 men (1982–2008) and 36,594 women (1992–2008) modifiable lifestyle factors and adiposity were ascertained at baseline in each cohort and incident diabetes was ascertained during follow-up. During an average follow-up of 22.6 years in men and 13.0 years in women, 2096 men and 2390 women developed diabetes. At 45 years of age, the residual lifetime risk of diabetes for men with 0, 1, 2, 3 and 4 plus healthy lifestyle factors was 30.5 (95% CI: 27.3–33.7); 21.5 (95% CI: 19.9–23.0); 15.1 (95% CI: 13.9–16.3); 10.3 (95% CI: 9.1–11.5); and 7.3 (95% CI: 5.7–8.9), respectively. Corresponding values for women were 31.4 (95% CI: 28.3–34.5); 24.1 (95% CI: 21.8–26.5); 14.2 (95% CI: 12.7–15.7); 11.6 (95% CI: 9.7–13.5); and 6.4 (95% CI: 4.2–8.6), respectively. These data show an inverse and graded relationship between desirable lifestyle factors and residual lifetime risk of diabetes in men and women. Not smoking and moderate

drinking may have additional benefits when added to exercise, weight control and diet.

By Dominique Hansen

**Mason C, Foster-Schubert KE, Imayama I et al. Dietary weight loss and exercise effects on insulin resistance in postmenopausal women. *Am. J. Prev. Med.* 41(4), 366–375 (2011).**

Comprehensive lifestyle interventions are effective in preventing diabetes and restoring glucose regulation. However, the key stimulus for change has not been identified and effects in older individuals are not established. The aim of the study was to investigate the independent and combined effects of dietary weight loss and exercise on insulin sensitivity and restoration of normal fasting glucose in middle-aged and older women. A total of 439 inactive, overweight/obese postmenopausal women were assigned to dietary weight loss (n = 118); exercise (n = 117); exercise plus diet (n = 117) or control (n = 87). The diet intervention was a group-based reduced-calorie program with a 10% weight-loss goal. The exercise intervention was 45 min/day, 5 days/week of aerobic activity of moderate-to-vigorous intensity. The 12-month change in serum insulin, C-peptide, fasting glucose and whole-body insulin resistance (HOMA-IR) were assessed. A significant improvement in HOMA-IR was detected in the diet (-24%; p < 0.001) and exercise plus diet (-26%; p < 0.001) groups but not in the exercise (-9%; p = 0.22) group compared with



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controls (-2%); these effects were similar in middle-aged (50–60 years) and older women (aged 60–75 years). Among those with impaired fasting glucose (5.6–6.9 mmol/l) at baseline (n = 143; 33%), the odds of regressing to normal fasting glucose after adjusting for weight loss and baseline levels were 2.5 (95% CI: 0.8–8.4); 2.76 (95% CI: 0.8–10.0); and 3.1 (95% CI: 1.0–9.9) in the diet, exercise plus diet, and exercise group, respectively, compared with controls. Dietary weight loss, with or without exercise, significantly improved insulin resistance. Older women derived as much benefit as the younger postmenopausal women.

By Dominique Hansen

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**Barakat R, Cordero Y, Coteron J, Luaces M, Montejo R. Exercise during pregnancy improves maternal glucose screen at 24–28 weeks: a randomised controlled trial. *Br. J. Sports Med.* doi:bjsports-2011-090009 (2011) (Epub ahead of print).**

The influence of an exercise program performed by healthy pregnant women on maternal glucose tolerance was studied. A physical activity (land/aquatic activities) program during the entire pregnancy (three sessions per week) was conducted by a qualified instructor. Eighty three healthy pregnant women were randomly assigned to either an exercise group (EG; n = 40) or a control (CG; n = 43) group. Maternal tolerance to a 50 g oral glucose load, maternal bodyweight gain and several pregnancy outcomes (such as adverse events) were recorded. Significant differences were found between study groups on the 50 g maternal glucose screen. Values corresponding to the EG (103.8 ± 20.4 mg/dl) were better than those of the CG (126.9 ± 29.5 mg/dl), p = 0.000. In addition, no differences in maternal weight gain and no cases of

gestational diabetes in EG versus three in CG (7%; p > 0.05) were found. A moderate physical activity program performed during pregnancy improves levels of maternal glucose tolerance.

By Dominique Hansen

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**Aouadi R, Khalifa R, Aouidet A et al. Aerobic training programs and glycemic control in diabetic children in relation to exercise frequency. *J. Sports Med. Phys. Fitness* 51(3), 393–400 (2011).**

The aim of this study was to assess the effect of aerobic training on glycemic control and lipid profile in diabetic children. Thirty three children with Type 1 diabetes mellitus were equally divided into three groups. The CG did not perform any training intervention during the period of the investigation and the subjects were instructed to continue with their daily lifestyle patterns. The second group (G1) and the third group (G2) completed a 6-month aerobic training program. During the period of the investigation, G1 participated in one daily session (~60 min) of aerobic exercise twice weekly, while G2 performed in the form of a daily session four-times a week (~60 min). Glycated hemoglobin (HbA1c) and lipid profile were measured before training intervention, and after 3 and 6 months. The 3-month periods was without significant changes of HbA1c in the two groups but significantly increased high-density lipoprotein cholesterol (HDL-C) in G1 (p < 0.05). In G2, an increase of HDL-C was accompanied by a decrease of serum triglyceride (TG) (p < 0.05). After 6 months, only HDL-C and TG levels were significantly lower in G1 (p < 0.01), while in G2 HDL-C increased (68.8 ± 5.7 vs 56.7 ± 7.2 mg/dl; p < 0.01), low-density lipoprotein cholesterol (69.2 ± 8.5 vs 81.6 ± 11.8 mg/dl; p < 0.01), TG concentrations decreased (60.7 ± 6.9 vs 77.4 ± 9.3 mg/dl; p < 0.01) and HbA1c was significantly lower (6.8 ± 1.1 vs 8.2 ± 1.5%;

Journal Watch highlights some of the most important papers recently published in the field of diabetes management and research. The editorial team welcomes recommendations for relevant papers for inclusion in future issues.

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$p < 0.05$ ), comparatively to those before training. The 6-month periods showed that children exercising more than two-times weekly significantly improved HbA1c and lipid profile. These results must encourage children with Type 1 diabetes mellitus to regularly practice sporty activities for long periods.

By Dominique Hansen

**Thorand B, Zierer A, Huth C, Linseisen J et al. Effect of serum 25-hydroxy vitamin D on risk for Type 2 diabetes may be partially mediated by subclinical inflammation. *Diabetes Care* 34(10), 2320–2322 (2011).**

In this case-cohort study, baseline levels of 25-hydroxy vitamin D (25[OH]D) were measured in 416 incident Type 2 diabetes case subjects and 1267 noncase subjects from a source population of 7936 middle-aged participants in the population-based Monitoring of Trends and Determinants in Cardiovascular Disease (MONICA)/Cooperative Health Research in the Region of Augsburg (KORA) study. After adjustment for diabetes risk factors, serum 25(OH)D and incident Type 2 diabetes showed significant inverse association. Adjustment for inflammatory markers like C-reactive protein, IL-6, soluble ICAM1 and IFN- $\gamma$  inducible protein 10, further attenuated this association by 16% (hazard ratio: 0.73;  $p = 0.090$ ).

By Pranav Dalal, Preethi Yerram and Adam Whaley-Connell

**Grimnes G, Figenschau Y, Almås B, Jorde R. Vitamin D, insulin secretion, sensitivity, and lipids: results from a case-control study and a randomized controlled trial using hyperglycemic clamp technique. *Diabetes* 60(11), 2748–2757 (2011).**

Participants from a large population-based study (the Tromsø Study) were recruited based on their serum 25(OH)D measurements. The 52 participants with high serum 25(OH)D levels ( $85.6 \pm 13.5$  nmol/l) had higher insulin sensitivity index, lower HbA1c and triglycerides than the 108 participants with low serum 25(OH)D ( $40.3 \pm 12.8$  nmol/l). The participants with low serum 25(OH)D were randomized to receive vitamin D supplement versus placebo. Correction of insufficient serum 25(OH)D levels did not improve insulin sensitivity and secretion or serum lipid profile.

By Pranav Dalal, Preethi Yerram and Adam Whaley-Connell

#### **Financial & competing interests disclosure**

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