Primary Prevention of Cardiovascular Disease with a Mediterranean Diet

BACKGROUND
Observational cohort studies and secondary prevention trials have shown an inverse association between adherence to the Mediterranean diet and cardiovascular risk. We conducted a randomized trial of this diet pattern for the primary prevention of cardiovascular events.

METHODS
In a multicenter trial in Spain, participants with high cardiovascular risk, but with no cardiovascular disease at enrollment, were randomly assigned to one of three diets: a Mediterranean diet supplemented with extra-virgin olive oil, a Mediterranean diet supplemented with mixed nuts, or a control diet (advice to reduce dietary fat). Participants received quarterly individual and group educational sessions and, depending on group assignment, free provision of extra-virgin olive oil, mixed nuts, or small non-food gifts. The primary end point was the rate of major cardiovascular events (myocardial infarction, stroke, or death from cardiovascular causes). On the basis of the results of an interim analysis, the trial was stopped after a median follow-up of 4.8 years.

RESULTS
A total of 7447 persons were enrolled (age range, 55 to 80 years); 57% were women. The two Mediterranean-diet groups had good adherence to the intervention, according to self-reported intake and biomarker analyses. A primary end-point event occurred in 288 participants. The multivariable-adjusted hazard ratios were 0.70 (95% confidence interval [CI], 0.54 to 0.92) and 0.72 (95% CI, 0.54 to 0.96) for the group assigned to a Mediterranean diet with extra-virgin olive oil (96 events) and the group assigned to a Mediterranean diet with nuts (83 events), respectively, versus the control group (109 events). No diet-related adverse effects were reported.

CONCLUSIONS
Among persons at high cardiovascular risk, a Mediterranean diet supplemented with extra-virgin olive oil or nuts reduced the incidence of major cardiovascular events.

Diabetes Literature Review

Although type 2 diabetes (T2D) is increasingly common in young patients, few studies have addressed its complications. The Australian authors have sought to assess the risk of microvascular complications in T2D and hypertension in comparison with type 1 diabetes (T1D) by performing a meta-analysis.

This meta-analysis included 25 studies involving 3,321 patients who were aged 28 or less. The median age of the patients with T2D was 14.5 years, the median duration of the diabetes was 1.7 years, and the median rate of glycated haemoglobin 7.7 %. The pooled analysis revealed prevalence rates for micro- and macroalbuminuria respectively of 18 % (17-20 %) and 5 % (3-7 %), the prevalence of hypertension was 28 % (26-29 %), that of diabetic retinopathy 2 % (1-3 %), that of peripheral neuropathy 2 % (1-4 %), and that of autonomic neuropathy 43 % (25-63 %).

In comparison with T1D, the analysis shows an increased risk of microalbuminuria (odds ratio = 3.5, confidence interval at 95 % from 1.6 to 7.8) and of hypertension (3.4, 2.4-4.8) in young subjects with T2D.

This meta-analysis shows more than a tripling of the risk of microalbuminuria and hypertension in children and adolescents with T2D for a lesser duration of diabetes than that of T1D. The authors, who were critical of the methodological shortcomings in the studies listed, insist on the need for implementing large-scale prospective studies so as to understand the specific risk factors of complications of T2D in young patients better in order to guide the detection, prevention, and treatment.

Blood test identifies glycoprotein biomarkers for gestational diabetes during the first trimester

Rasanen JP and colleagues, have described a blood test that identifies glycoprotein biomarkers in pregnant women during the first trimester of pregnancy, accurately predicting gestational diabetes (GDM) 92 % of the time. That suggests that doctors may be able to determine a mother’s risk for this condition as early as her first prenatal visit.

The investigators studied fibronectin glycosylation associated with Sambucus nigra lectin binding (FN-SNA), and found that the mean FN-SNA concentration was greater in participants who later developed GDM than in controls (102+30 mg/L vs. 56+15 mg/L; P<0.0001). At a false-positive rate of 4 %, FN-SNA alone detected 84 % of first-trimester GDM cases. The detection rate increased to 92 % with addition of adiponectin and CRP.


Indiana Canine Assistance Network describes training their first hypoglycaemia alert dog

The Indiana Canine Assistance Network in Indianapolis, Indiana, has for the past decade trained dogs for mobility assistance for persons with disabilities. They described the results of training their first hypoglycaemia alert dog.

A two-year-old mobility assistance Labrador/Golden Retriever was trained to recognize hypoglycaemia through exposure to perspiration samples collected from patients during hypoglycaemia (blood glucose <3.6 mmol/L) and normoglycaemia. After the dog was introduced to the potential owner, the owner’s perspiration samples were used to complete training before placement.

The correlation between alerts (nudging the owner’s arm) and hypoglycaemic events (by self-monitored blood glucose) was greater than 98 % by three months post-dog placement.

Several receptors involved in the detection and signal transduction of taste are expressed in the intestinal endocrine cells, where they regulate the chemosensory functions of the intestine such as the incretin effect. Glucose administered orally, but not systemically, results in the secretion of the incretin hormone GLP-1, which regulates insulin secretion and maintains glucose homeostasis.

The intestinal endocrine cells express sweet taste receptors, such as gustducin, a G-protein receptor, and several other elements involved in taste transduction. Knockout mice for gustducin or the T1R3 sub-unit of the sweet taste receptor exhibited a deficiency in secreting GLP-1 and in regulating insulin and glucose in the blood. The intestinal cell lineages which express gustducin and receptors and other taste signals were studied to identify the roles of these taste proteins in the regulation and secretion of GLP-1.

Another example of gastrointestinal chemosensory regulation is that of the pancreatic endocrine cells that express numerous taste proteins, also being involved in the regulation of insulin secretion.

Furthermore, the taste cells in the mouth express GLP-1, other intestinal hormones, and the insulin receptor. More recently, intestinal-type glucose transporters and pancreatic ATP-type potassium channels (K-ATP metabolic sensors) were identified as being present in taste cells and potentially functioning as sweet-taste detectors of sugars.

To sum up, these studies highlight the similarities between taste and intestinal chemosensory control and show the importance of the "intestinal taste cells" and the "tongue endocrine cells" in co-ordinating the hormonal response to maintain glucose homeostasis.

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Intensive lifestyle intervention helps women with impaired glucose tolerance live longer

Researchers from China, Switzerland, and the United States measured mortality rates among men and women 23 years after a six-year intervention period. In 1986, 576 adults with impaired glucose tolerance (IGT) were randomly assigned to control or one of three lifestyle intervention groups (diet, exercise, and diet plus exercise). The intervention took place from 1986 to 1992. In 2009, 23 years after randomization, study participants were traced to determine the long-term effects of the intervention on all-cause and CVD mortality, using intent-to-treat analysis.

Forty-seven women and 127 men had died. In women, the intervention reduced all-cause mortality by 53 % (hazard rate ratio [HRR] 0.47; 95 % confidence interval [CI], 0.25 to 0.86) with a cumulative all-cause mortality of 29.3 % (CI, 17.5 to 48.0) in the control arm and 16.2 % (CI, 11.2 to 21.2) in the intervention arm (P=0.02). According to the researchers, the reduction in all-cause mortality in women was mainly due to differences in CVD mortality (heart disease and stroke) (HRR 0.30; CI, 0.12 to 0.68) with a 23-year cumulative mortality of 18.8 % (CI, 8.8 to 28.8) in the control and 6.8 % (CI, 3.4 to 10.2) in the intervention arm (P=0.006).

Among men, there was no significant difference between the intervention and control groups in cumulative all-cause mortality (41.1 % vs. 46.7 %, P=0.41) or CVD mortality (26.4 % vs. 27.4 %, P=0.47).

Children diagnosed with type 2 may have faster disease progression than people diagnosed as adults

According to data from the TODAY study of children (10-17 years) with diabetes, those diagnosed with type 2 diabetes appear to experience more rapid disease progression than people diagnosed as adults. They have a higher rate of early complications and a relatively early need for combination therapy or insulin.

The trial was designed to test the efficacy and safety of diabetes medications for young people, but also was able to identify which children would have faster progression based on their initial response to treatment (with metformin). Those with good glycaemic control (normal A1C) after two to four months on metformin during the pre-randomization period, were more likely to maintain that control for at least 48 months than those whose A1C levels were greater than 6.1 % after the first few months of metformin.

But a high rate of co-morbidities was manifest within a relatively short time. Nearly one-third of the children in the study exhibited high blood pressure by the end of the study's mean follow-up of just under four years (compared to just 12 % at the beginning of the study); and nearly 17 % exhibited elevated urinary albumin levels, up from 6 % at the beginning of the study). Roughly 13 % of those in the study exhibited signs of eye disease.


Both type 1 and type 2 diabetes increased substantially among young over past decade

The prevalence of both type 1 and type 2 diabetes increased substantially among young people over the past decade, according to the first analysis of diabetes trends among American youth.

Investigators for the SEARCH for Diabetes in Youth study, funded by the Centers for Disease Control and Prevention (CDC) and the NIH found that, overall, the prevalence of type 2 diabetes had increased 21 % among American youth from 2001 to 2009, while type 1 diabetes rose 23 %. The data suggest that there were nearly 189,000 Americans under the age of 20 with diabetes; of those, 168,000 had type 1 and more than 19,000 had type 2.

As known, children and adolescents with diabetes are at risk for complications such as peripheral neuropathy. Say the researchers, many already show measurable signs of it. This could increase their future risk of lower limb amputations. Further, youth with type 2 diabetes are more likely to have proteinuria than youth with type 1, suggesting they may have a greater risk for kidney disease later in life.

According to G, Medical Epidemiologist with the Division of Diabetes Translation at the CDC, “We’ve known this was happening for a while, but now we have data that tell us just how big a problem it has become.”


Analysis shows most with T1D fail to meet treatment targets

Most people with type 1 diabetes fail to meet treatment targets, are more often overweight or obese as adults, and have difficulty reaching target A1C levels as youth, according to the most comprehensive analysis of T1D ever undertaken in the United States.

A majority of adults with T1D were overweight/obese, with A1C from 7.5 %-8.0 %). While adults over age 50 had the lowest average A1C of all age groups (7.6 %), they also had a surprising 14-20 % risk per year of severe hypoglycaemia. In those over age 40, 20-30 % had diabetes complications.

The findings were from five separate analyses, which examined data from the T1D Exchange Clinic Registry. That is a collection of data from more than 25,000 volunteer participants of all ages from 67 clinics nationwide. “This is the first time we’ve ever been able to get a really clear picture of how people with type 1 diabetes are faring in the United States,” said R M Bergenstal, MD, from the International Diabetes Center and Vice-Chair of the T1D Exchange.