

Mediterranean Diet Helps Offset Bad Genes

Study Shows Mediterranean Diet Boosts Heart Health in People Genetically Wired for Poor Heart Health

By Joanna Broder WebMD Health News Reviewed by Laura J. Martin, MD

July 16, 2010 -- A Mediterranean-style diet -- one that is rich in fresh fruits, vegetables, and whole grains and low in saturated fats -- promotes heart function even in men who are genetically predisposed to poor heart health.

That is the finding of a new study of twins published in the July issue of *Circulation: Cardiovascular Quality and Outcomes*, a journal of the American Heart Association.

"This means that the autonomic system controlling someone's heart rate works better in people who eat a diet similar to a Mediterranean diet," study leader Jun Dai, MD, PhD, said in a written statement. Dai is an assistant professor of nutrition and epidemiology in the Applied Health Science Department at Indiana University in Bloomington.

A Mediterranean-style diet refers to the traditional cooking style of countries bordering the Mediterranean Sea. The diet includes: fish, legumes, fruits, vegetables, whole grains, and nuts; spices and herbs to flavor foods rather than salt; and wine in moderation. The diet is known to reduce the risk of coronary disease, but until now the mechanism had been poorly understood, Dai and colleagues say.

In this study, however, researchers showed that a Mediterranean-style diet is related to higher heart rate variability (HRV), a measure of the time interval between a person's heart beats during everyday life.

Lower heart rate variability is a risk factor for coronary artery disease. Higher heart rate variability reflects good autonomic function of the heart and shows that the organ has a higher capacity to adjust to the challenges and variations that come its way, Dai tells WebMD. Such challenges include responding to temperature changes and breaking down nutrients after eating, she says.

In order to conduct their analysis, the researchers administered food frequency questionnaires to 276 middle-aged male twins. Diet can influence heart rate variability, but this association can be confounded by environmental and genetic factors. Using twins enabled researchers to examine the influence of diet on heart rate variability while controlling for genetic and other familial influences.

Using a published algorithm, researchers approximated how closely the men's diets conformed to a Mediterranean-style diet and then scored each participant; the higher the score, the greater the similarity to the Mediterranean-style diet.

To measure heart rate variation, all twins had their heart's electrical activity continuously measured and recorded with a Holter monitor, a portable, battery-operated electrocardiogram device.

Findings showed that the more a person's diet resembled a Mediterranean-style diet, the more variable the heart beat-to-beat time interval -- 10% to 58% (depending on the HRV measure considered) for men in the top Mediterranean diet score quarter compared to those in the lowest quarter; this equates to a 9% to 14 % reduction in heart-related death.

Genetic influence on heart rate variability frequency ranged from 20% to 95%, depending on the heart rate variability measure considered.

<http://www.webmd.com/heart-disease/news/20100616/mediterranean-diet-helps-offset-bad-genes>

Over →

Mediterranean Dietary Pattern Is Associated With Improved Cardiac Autonomic Function Among Middle-Aged Men

A Twin Study Jun Dai, MD, MSc, PhD; Rachel Lampert, MD; Peter W. Wilson, MD; Jack Goldberg, PhD; Thomas R. Ziegler, MD and Viola Vaccarino, MD, PhD

From the Department of Applied Health Science (J.D.), School of Health, Physical Education, and Recreation, Indiana University, Bloomington, Ind; Indiana Center for Vascular Biology and Medicine (J.D.), Indianapolis, Ind; the Section of Cardiovascular Medicine (R.L.), Yale University School of Medicine, New Haven, Conn; the Department of Medicine (P.W.W., V.V.), Division of Cardiology, Emory Program in Cardiovascular Outcomes Research and Epidemiology (EPICORE), Emory University School of Medicine, Atlanta, Ga; the Department of Medicine (T.R.Z.), Division of Endocrinology, Metabolism, and Lipids, Emory University School of Medicine, Atlanta, Ga; Vietnam Era Twin Registry (J.G.), Seattle VA Epidemiologic Research and Information Center and the Department of Epidemiology, School of Public Health, University of Washington, Seattle; the Department of Epidemiology (P.W.W., V.V.), Rollins School of Public Health, Emory University, Atlanta, Ga; the Center of Epidemiology and Genomic Medicine (P.W.W.), Atlanta VA Medical Center, Atlanta, Ga; and the Nutrition and Health Sciences Graduate Program (T.R.Z., V.V.), Emory University, Atlanta, Ga.

Correspondence to Jun Dai, MD, MSc, PhD, 1025 E. 7th St, HPER 116, Indiana University, Bloomington, IN 47405. E-mail jdai@indiana.edu

Background Reduced heart rate variability (HRV), a measure of cardiac autonomic dysfunction, is a risk factor for coronary artery disease. Diet can influence HRV, but this association may be confounded by genetic and environmental factors.

Methods and Results We administered the Willett Food Frequency Questionnaire to 276 middle-aged male twins. We derived a score measuring the extent to which an individual's diet conformed to the Mediterranean diet following a published algorithm. The higher the score, the greater the similarity to the Mediterranean diet. All twins underwent 24-hour ambulatory ECG recording. Time and frequency domain measures of HRV were calculated. Mixed-effects regression was used to partition the association into between- and within-twin pair differences. After adjusting for energy intake, other nutritional factors, shared genes, and common environment, a 1-unit higher score was significantly associated with 3.9% to 13% higher time and frequency domain HRV parameters. Further controlling for known cardiovascular risk factors and use of fish oil supplements and medications did not substantially change the estimates.

Conclusions The Mediterranean dietary pattern is associated with higher HRV.

<http://circoutcomes.ahajournals.org/cgi/content/abstract/CIRCOUTCOMES.109.905810v1>

Your Diet Could be More Important Than Your Genes

Mercola.com July 08 2010

A Mediterranean-style diet promotes heart function—even in men who are normally genetically predisposed to poor heart health. This means that the autonomic system controlling your heart rate works better if you eat a Mediterranean or similar diet, no matter what your genes. In a study, researchers showed that a Mediterranean-style diet is related to higher heart rate variability (HRV), a measure of the time interval between a person's heart beats. Low heart rate variability is a risk factor for coronary artery disease.

WebMD reports:

"In order to conduct their analysis, the researchers administered food frequency questionnaires to 276 middle-aged male twins. Diet can influence heart rate variability, but this association can be

confounded by environmental and genetic factors. Using twins enabled researchers to examine the influence of diet on heart rate variability while controlling for genetic and other familial influences.”

Sources: WebMD June 16, 2010; Circulation: Cardiovascular Quality and Outcomes June 15, 2010 [Epub ahead of print]

Over →

Page 3

Dr. Mercola's Comments:

You may think you've inherited a "bad heart" or are prone to breast cancer (or any disease for that matter) because a close family member had it. But please toss these thoughts from your mind right now, because you, and you alone, are in control of your health destiny. This study on identical twins is just the latest to show that your lifestyle, in this case your diet, trumps your genes in terms of how your health pans out. Identical twins really give a unique and valuable opportunity to see just how big an influence your habits have on your health, as of course identical twins start out exactly the same, genetically speaking. However, as this new study shows, they often don't end up the same. Among men who ate a healthful Mediterranean-style diet, heart rate variability was higher, which reflects good autonomic function of the heart. For those who scored in the top quarter for eating a Mediterranean-style diet, the benefits to heart rate variability equated to a 9-14 percent lower risk of heart-related death. Even among identical twins who have the exact same DNA, dietary choices influence the health of their heart come middle age.

Great News: Your Genes Can Be Influenced!

Epigenetic "malleability" helps to explain why identical twins become distinct as they age, health-wise, and it explains how you can actually tweak your genes for better or worse, too. In fact, you ARE changing your genetics daily and perhaps even hourly from the foods you eat, the air you breathe, and even by the thoughts you think. You are the "caretaker" of your genetic roadmap. As you age, your genome does not change but your epigenome changes dramatically, especially during critical periods of life, such as adolescence. It is influenced by physical and emotional stresses -- how you respond to everything that happens in your environment, from climate change to childhood abuse. The secret is in the methyl groups that overlie the DNA molecule, which is the realm of the epigenome. When a gene is turned off epigenetically, the DNA has usually been "methylated." When methyl groups adhere to a segment of DNA, they inhibit the gene from being expressed. For the most part you do not manifest disease merely by a defective gene, but by the regulation or expression of your gene by epigenetic influences. This is good news as scientists have discovered it is easier to make epigenetic changes than to fix damaged genes. Your epigenome becomes dysfunctional easier -- but it's also easier to fix.

How Genetic Expression Works

In his book, *The Biology of Belief*, Dr. Lipton explains the foundation of epigenetics, and how the true secret to life does not lie within your DNA, but rather within the mechanisms of the cell membrane. In this way -- which is contrary to conventional medical science -- it is actually the cell's membrane -- operating in response to environmental signals picked up by the membrane's receptors -- that control the "reading" or "expression" of the genes inside. For instance, researchers from the Linus Pauling Institute at Oregon State University recently explained at *Experimental Biology 2010* how altered "histone modifications" can impact the expression of many degenerative diseases, ranging from cancer and heart disease to bipolar disorder and even aging itself. As Dr. Jean-Pierre Issa at the M.D. Anderson Cancer Center explains, histones can essentially "hug" DNA so tightly that it becomes "hidden from view for the cell." So while you have tumor suppressor genes in your body right now in ALL of your cells, you also have proteins called histones. If a tumor suppressor gene is hidden, it cannot be utilized, and in this way too much histone deacetylases, or HDACs, will "turn off" these cancer suppressors. Now here's where epigenetics comes in ... there are many HDAC inhibitors out there that will essentially

block the HDAC, allowing your tumor suppressor genes to activate and fight cancer. These HDAC inhibitors exist, at least in part, in common foods like broccoli and other cruciferous vegetables, garlic and onions. By adding these foods to your diet, you are supporting your body's ability to fight tumors. And this is only one example of many.

How to "Remind" Your Cells to be Healthy

Ideally you're already leading a healthy lifestyle, eating right, exercising and managing stress, but if you're not it's never too late to start. Each tissue only uses about 10 percent to 20 percent of its gene complement, and you want to be sure that those genes are the most advantageous ones possible for your health. You can begin to "remind" your cells to express in a healthful way, long before you manifest a disease, by encouraging your genes to express positive, disease-fighting behaviors by leading a healthy lifestyle. When it comes to epigenetic expression, keep in mind that diet is only part of the equation. You can also turn your genes on and off with your emotions. Most people have emotional traumas that can adversely affect their health, but using techniques like energy psychology you can go in and correct the trauma and actually regulate the expression of your genes. My favorite technique for this is Meridian Tapping Technique/Emotional Freedom Technique (MTT/EFT). And remember, it's never too late to start "training" your genes to express in a positive way. Whether you have hereditary health problems you're trying to circumvent or not, everyone's genes can benefit from good nutrition and attention to stress management.

<http://articles.mercola.com/sites/articles/archive/2010/07/08/your-diet-could-be-more-important-than-your-genes.aspx>

Dr John G. Schoenenberger
1215 Blackbridge Rd
Janesville WI 53545
608-754-4216