

THE DIET-HEART HYPOTHESIS

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There are known knowns—things that we know that we know; there are known unknowns—things that we know that we do not know. But there are also unknown unknowns—things that we don't know we don't know.

- Donald Rumsfeld,

U.S. Secretary of Defense, Feb. 2002

There is another category. The “unknown knowns—the disavowed beliefs, suppositions and . . . practices we pretend not to know about . . .”

- Slavoj Zizek,

Institute of Sociology, University of Ljubljana,
Slovenia, May 2004

Myths: generally accepted ideas unsubstantiated by fact.

- Standard dictionary

Our series on the theme “debunking medical myths” continues in this issue with a provocative analysis of the scientific basis for the *diet-heart hypothesis*, which states that dietary saturated fats and cholesterol cause high blood cholesterol and cardiovascular disease. Though that postulate has been widely accepted since the 1960's, it has been questioned periodically, and—as Dr. Christopher Wenger implies in his article in this issue—it may be just a myth. In terms of what we really know about the diet-heart hypothesis, or what we think we know, or what we don't know, there are probably aspects that fit into each of the categories mentioned in the quotes above.

I became interested in this subject quite a long time ago when I was a Surgical Fellow at the National Heart Institute (NHI) from 1965-1967, during the era when the late Donald Fredrickson was doing his landmark studies that used electrophoresis to identify and classify lipoprotein disorders.

The classification, which was subsequently named for Fredrickson, attracted considerable attention at the time, and as head of the NHI after 1967, Fredrickson had an influential public voice. He and his co-worker

Bob Levy were among those who made a strong case for dietary control of blood lipids, since there were no effective drugs to do so.¹

Though I was in the surgery branch of the NHI, we were all aware of their work, which seemed more objective and therefore persuasive than the oft-criticized epidemiological studies that Ancel Keys was publishing. And so, like many of my colleagues at the NHI, and before Fredrickson's studies had the substantial clinical impact outside the insular world of the NIH that they soon would have, I stopped eating eggs, marbled steaks, and other major dietary sources of saturated fat and cholesterol. We gave our children only skim milk, and they soon grew to dislike the taste of regular milk.

What was cutting-edge at the NIH soon became main stream. By the 1970's, countless epidemiological studies, as well as official pronouncements by the American Heart Association, hammered home the message that dietary saturated fat is the root of all evil. Later, trans fat was also criticized, though with much more scientific proof.

Still, there have always been dissenting voices insisting that the story is not so clear. In fact, as Dr. Wenger points out, the diet-heart hypothesis is more poorly documented than is commonly appreciated.² I urge you to read Dr. Wenger's article carefully and critically, because it will be hard for you to find such a comprehensive and readable overview of the scientific aspects of the controversy in one place. As he explains, abundant data indicate that the actual villain may be carbohydrates. The worst offenders are refined sugars, and carbs with a high glycemic index. Both have substantial effects on blood glucose and insulin levels, and insulin has a profound effect on how we store and metabolize fat.

EVOLUTION AND THE DIET-HEART HYPOTHESIS

Any explanation of a dilemma in medicine, as in any field of biology, should be consistent with modern concepts of evolution, since—as biologist Theodosius Dobzhansky famously observed, “Nothing in biology

makes sense except in the light of evolution.”* For several million years during the Paleolithic Era we were hunter-gatherers, eating whatever animals and seafood we could hunt, trap, or snare, accompanied by fruits, berries, vegetables, roots, and nuts. This era ended when agriculture was invented about 10,000 years ago (“yesterday” in evolutionary time), and grains became a major part of the human diet.

Considerable research has therefore focused on the nutrient content of Paleolithic, pre-agricultural, human diets, on the assumption that we adapted to them over millions of years. Meskin and co-workers studied hunter-gatherer societies that remain today and concluded that “the normal dietary intake of *saturated* fatty acids that conditioned our genome likely fell between 10-15% of total energy.”³ They decided that neither extremely *low* nor *high* lifelong consumption of dietary saturated fatty acids is likely to be suitable for the human genome. Though 10-15% saturated fat might seem a lower number than would be expected among hunters who depend on eating the flesh of animals, this is not the figure for total fats, and most wild animals are quite lean. (An exception, of course, are northern peoples like the Inuit who subsist on fatty seals and oily fish and therefore consume more fat, but those fats are often not saturated.)

Skepticism about the diet-heart hypothesis has prompted a variety of alternative diets, many of which are variants of the so-called “*paleo diet*,” based on the conviction that we are genetically adapted to eat what our ancestors ate during the pre-agricultural Paleolithic Era. The paleo diet includes the hunter-gatherer foods discussed above, and eliminates a lengthy list of foods that includes grains such as oats, wheat, barley, and rice; starchy vegetables such as potatoes and corn; legumes or beans including soy beans; dairy products, high-fat meats, sugar, processed foods, trans fats, and salt.

It’s important to distinguish between adhering to a rigid diet because it promotes weight loss, and doing so because it promotes good health. One can lose weight with a variety of diets, but most people have difficulty maintaining major weight loss without bariatric surgery. The principle of the low carb diet for weight loss is that it fundamentally alters the body’s metabolism by reducing insulin surges and promoting utilization of fat for energy. Dr. Robert Atkins promoted a high fat diet for weight loss in the 1970s, but it was criticized on the presumption that it would have a deleterious effect on blood lipids. A recent randomized trial suggests that is not necessarily the case.⁴

Before committing to a lifetime of abstinence from all carbohydrate pleasures, those of us who don’t need to lose weight might wish to know if refusing tasty sweets provides enough health benefits to justify our masochism. Evolution’s most powerful selection pressure is through the effect of various characteristics on reproductive success. As long as an individual can produce a normal number of healthy offspring, its genes will be passed on regardless of the late-onset diseases that lurk within its DNA. Since arteriosclerosis is generally late-onset, Darwinian selection pressure from diet was probably exerted on evolving pre-humans and early humans via health issues other than heart disease, such as resistance to infection. A paleo diet virtually eliminates gluten, which may have important effects on the immune system, particularly in sensitive individuals, as pointed out in Dr. Shih’s recent article on gut flora in this journal.⁵ These extra-vascular effects have not been well assessed with respect to dietary fats.

Finally, it is worth noting that late-onset diseases might exert negative selection pressure indirectly. In paleolithic societies, for example, the men usually hunted and the women usually gathered, so

NOTE

* The “modern evolutionary synthesis,” a term originated by Julian Huxley, is the current paradigm in evolutionary biology that combines Darwin’s original concept of natural selection with the modern understanding of genes (which Darwin knew nothing about), inheritance, and “systematics.” The latter term includes the mechanisms by which speciation occurs (such as geographic isolation), and how changes seen in local populations (‘microevolution’) can gradually bring about the broad-scale changes (‘macroevolution’) seen by paleontologists.

Although Dobzhansky’s statement is often mistakenly thought to be anti-creationism, nothing could be farther from the truth. Dobzhansky was

a Russian Orthodox Christian, and this statement was the title of a 1973 essay in which he argued that Christianity and evolutionary biology are compatible. He said “I am a creationist and an evolutionist. Evolution is God’s, or Nature’s method of creation. Creation is not an event that happened in 4004 BC; it is a process that began some 10 billion years ago and is still under way.” The phrase “light of evolution” came from the Jesuit priest Teilhard de Chardin, who said: (Evolution is a) “general condition to which all theories, all hypotheses, all systems must bow. . . . if they are to be thinkable and true. Evolution is a light which illuminates all facts . . .” (p. 219 of *Phenomenon of Man*).

grandparents might have had primary responsibility for child care. In family groups where the elders were sick or dead, infant and child mortality might have been higher, thus providing a mechanism for even late-onset diseases to influence reproductive success.

ALSO IN THIS ISSUE

The article on Medical Marijuana by Dr. Scott Paist is particularly timely and no longer hypothetical, as passage of a medical marijuana law in Pennsylvania is becoming a distinct possibility.⁶ A February 2013 Franklin & Marshall College Poll indicated that 82 percent of Pennsylvanians favored allowing adults to use marijuana for medical purposes if recommended by a doctor. Physicians are also supportive.⁷

Dr. Lisa Ruth-Sahd, a regular contributor to this *Journal* on issues in nursing education, discusses the impact of the Summer Nursing Externships at LGH on the nursing students whom we regularly encounter. We physicians who had sub-internships as medical students

will notice many parallels to the experiences of these nursing students in their externships.

Even if you have no interest in cardiology, take note of Dr. Matthew Bernabei's article on the Micra Transcatheter Pacing Study. It is one of those advances that prompts the reaction: "What will they think of next!" He is not exaggerating when he calls it a "revolution in pacemaking." You must read the article and look at the figures to see the revolutionary engineering advances that have permitted an entire pacemaker to be contained within a capsule so small that it can be delivered into the heart via a catheter, thus eliminating the transvenous lead.

Another remarkable technological advance in an entirely different direction is described by Drs. Ochalski and Filer. Oocyte cryopreservation enables women to set aside viable ova (not embryos) even if they are not ready to have them fertilized.

Finally, as always, Dr. Alan Peterson rounds out the issue with his update on Choosing Wisely issues, and his habitual Top Tips.

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