



## Are There Advantages to Having Diabetes?

**T**he question in my title may strike many of you as ludicrous in the extreme. How could there possibly be any advantages to having a devastating disease such as diabetes? Diabetes is a lifelong problem, requiring eternal diligence to achieve even a semblance of blood sugar control. A continual effort is needed to balance caloric intake with antidiabetic medications and to factor in the often-unpredictable effects of variations in the amount of exercise and stress. Even with the best efforts of the most conscientious patients, diabetes is a disease that can have devastating consequences. We all know of the multitude of vascular complications that come with long-standing diabetes, which are divided into microvascular (small vessel) and macrovascular (large vessel) pathologies. The microvascular complications are retinopathy, neuropathy, and nephropathy, any of which can be totally devastating to an individual patient. The macrovascular complications include a markedly increased risk of cardiac disease, cerebrovascular disease, and peripheral artery disease (PAD). PAD alone accounts for a 20-fold increase in the risk of losing an extremity compared with the risk of such a disastrous fate in a person without diabetes.

Let's pause, and stop to think for a moment. If the disease is so devastating and does such bad things to its victims, why does it survive in the gene pool? Indeed, why has it grown even more common in our modern world even as it destroys lives and wreaks havoc with blood vessels, large and small? Is it possible, just possible, that there are some potential advan-

tages (gasp!) to having this awful metabolic disorder?

Let me approach this question in a roundabout manner by telling you about a case that one of our more conscientious residents presented at morning report. The case was not from our medical center, but rather from our affiliate where the housestaff spend half their time and receive half their training. The case was presented as one of elder abuse, which

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it indeed was. An elderly woman in her mid-70s was feeble and housebound, in part due to her long-standing diabetes, which had already led to a below-the-knee amputation. She was supposedly under the care of her daughter and her boyfriend, but both were alcoholics who routinely abused the woman, both verbally and physically. Indeed, one of their special ways of tormenting her was to deny her access to both her diabetic medications and to any food or nourishment. The woman was a bit more self-sufficient than they realized, though, because when they would routinely pass out after excessive indulgence in alcoholic delights, she would use a stepladder to get to the secret stash of oatmeal

cookies that they deliberately hid from her. She was losing weight, predictably enough, but she was somehow able to hang on long enough until an old friend tracked her down and discovered the pitiful conditions she was living under. The resident presenting the case rightfully emphasized the shameful nature of this obvious case of elder abuse and also the semiheroic role of the concerned friend who ultimately came to her rescue.

After the appropriate discussion of elder abuse and its prevention had ensued, I decided to point out to the morning report audience that there was one other important aspect to this case that had not yet been discussed. A number of the trainees and faculty in attendance were very surprised when I pointed out how lucky this patient had been that she had type 2 diabetes. I observed that she might have not survived her ordeal of abuse and chronic food deprivation had she not had diabetes. I explained that this case demonstrated quite nicely the survival advantages that occur from having diabetes. When the food supply is erratic and unpredictable, having diabetes affords a tremendous advantage: It allows one to maintain one's blood sugar in spite of an unreliable food supply.

There are multiple historical examples that illustrate this point. During World War II, the Nazis subjected occupied Holland to starvation conditions, because they were angry over resistance activities. At the end of the war, the percentage of the population with diabetes increased because of preferential survival due to the ability to maintain blood sugar in the face of an inadequate food supply. A similar phenomenon occurred

in areas of the Soviet Union in the 1930s, when Stalin decided to overcome resistance to his domination through brutal starvation tactics. Here at home there is another probable example right in my backyard. The Pima Indians of Arizona have the world's highest prevalence of type 2 diabetes, with devastating vascular consequences. They blame the white man for their sorry state, and they may be

right. In the late 19th century, white settlers came to Arizona and altered the course of the Gila River, thus, causing massive crop failures and resulting in famine in the Indians' territory. The theory is that those without genetic diabetes died out, while those with diabetes were able to hang on, reproduce, and perpetuate the diabetic genes in the overall gene pool. This is not positively established, of

course, but the theory illustrates again how diabetes can perversely be an advantage in times of an unreliable food supply.

So, the scourge of diabetes is something we know to be an awful thing. Yet, the harsh realities of genetic selection seem to have left us in a situation where a very sizable fraction of our population is genetically susceptible to this disease. A frustrating situation, no? ●