Strange Biology

PHENOMENA PECULIAR TO DIABETES
THAT CAN AFFECT BLOOD SUGAR

The Complete Guide to Achieving Normal Blood Sugars

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Chapter 6

Sometimes, even when you think you're doing everything right, your blood sugars may not respond as you expect. Often this will be due to one or more of the biologic curiosities that affect diabetics. The purpose of this chapter is to acquaint you with some real phenomena that can confound your plans, but which you can frequently circumvent if you are aware of them.

Part 4 of 5

THE CHINESE RESTAURANT EFFECT

Many years ago a patient asked me why her blood sugar went from 90 mg/dl up to 300 mg/dl every afternoon after she went swimming. I asked what she ate before the swim. "Nothing, just a freebie," she replied. As it turned out, the "freebie" was lettuce. When I asked her just how much lettuce she was eating before her swims, she replied, "A head."

A head of lettuce contains about 10 grams of carbohydrate, which can raise a type 1 adult's blood sugar about 50 mg/dl at most. So what accounts for the other 160 mg/dl rise in her blood sugar?

The explanation lies in what I call the Chinese restaurant effect. Often Chinese restaurant meals contain large amounts of protein or slow-acting, low-carbohydrate foods, such as bean sprouts, bok choy, mushrooms, bamboo shoots, and water chestnuts, that can make you feel full.

How can these low-carbohydrate foods affect blood sugar so dramatically?

The upper part of the small intestine contains cells that release hormones into the bloodstream when they are stretched, as after a meal. These hormones signal the pancreas to produce some insulin to prevent the blood sugar rise that might otherwise follow the digestion of a meal. Large meals will cause greater stretching of the intestinal cells, which in turn will secrete proportionately larger amounts of these hormones. Since a very small amount of insulin released by the pancreas can cause a large drop in blood sugar, the pancreas simultaneously produces the less potent hormone glucagon to offset the potential excess effect of the insulin. If you're diabetic and deficient in producing insulin, you might not release insulin, but you will still release glucagon, which will cause gluconeogenesis and glycogenolysis and thereby raise your blood sugar. Thus, if you eat enough to feel stuffed, your blood sugar can go up by a large amount, even if you eat something undigestible, such as sawdust.

The first lesson here is: *Don't stuff yourself*. The second lesson is: *There's no such thing as a freebie.** Any solid food that you eat can raise your blood sugar.

THE EFFECTS OF EXERCISE UPON BLOOD SUGAR

Exercise can have varying effects upon blood sugar, depending upon a number of variables, including the type of exercise, how vigorously it's performed, when it is performed, and what type of medication you are using, if any. These effects are too varied and numerous to discuss in this brief space. Please see Chapter 14,"Using Exercise to Enhance Insulin Sensitivity," if you are embarking on an exercise program or find your blood sugars unpredictably affected by your existing exercise program.

THE HONEYMOON PERIOD

At the time they are diagnosed, type 1 diabetics usually have experienced very high blood sugars that cause a host of unpleasant symptoms, such as weight loss, frequent urination, and severe thirst. These symptoms subside soon after treatment with injected insulin begins. After a few weeks of insulin therapy, many patients experience a dramatic reduction of insulin requirements, almost as if the diabetes were reversing. Blood sugars may become nearly normal, even with low insulin doses. This benign "honeymoon period" may last weeks, months, or even as long as a year. If the medical treatment is conventional, the honeymoon period eventually terminates and the well-known roller coaster of blood sugar swings ensues.

Why doesn't the honeymoon period last forever? My experience with patients indicates that it can, *with proper treatment*. But there are several likely reasons why it does not with conventional treatment. At this writing, however, they still remain speculative.

- The normal human pancreas contains many more insulin producing beta cells than are necessary for maintaining normal blood sugars. For blood sugar to increase abnormally, at least 80 percent of the beta cells must have been destroyed. In early type 1 diabetes, many of the remaining 20 percent have been weakened by glucose toxicity from constant high blood sugars and by overwork.

- These beta cells can recover if they are given a rest with the help of injected insulin. Even if they recover, however, they still must work at least five times as hard to match the job of a normal pancreas working at 100 percent capacity. Eventually, with conventional treatment, this overwork causes them to break down.

- It is now believed that high blood glucose levels are toxic to beta cells. Even a brief blood sugar increase after a high-carbohydrate meal may take a small toll. Over time, the cumulative effect may wipe them out completely.

- The autoimmune attack upon beta cells, the presumed cause of type 1 diabetes, is focused upon several proteins. One is insulin, and another is present on the special vesicles—or bubbles— that are formed at the outer membrane of the beta cell. These vesicles contain insulin. Normally, they burst at the surface of the cell, releasing insulin granules into the bloodstream. The more vesicles created when more insulin is

manufactured, the greater the autoimmune attack upon the beta cell. If less insulin is released, less of this protein is exposed to attack.

Based upon my experience with the fair number of type 1 diabetics I' ve treated from the time of diagnosis, I' m convinced that the honeymoon period can be prolonged indefinitely. The trick is to assist the pancreas and keep it as quiescent as possible. With the meticulous use of small doses of injected insulin and with the essential use of a very low carbohydrate diet, the remaining capacity of the pancreas, I believe, can be preserved.

* Except for noncaloric fluids that flow through the intestines without causing distention.

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Author's Note
This book is not intended as a substitute for professional medical care. The reader should regularly consult a physician for all health-related problems and routine care.
