

Dakota Diabetes Coalition is proud to offer this column on diabetes and related concerns every other Friday.



Dr. Johnson is a family practice doctor in Grand Forks with a special interest in diabetes -- and a special knack for writing. As a member of the Dakota Diabetes Coalition, he has generously made himself available to answer questions through our listserv. If you have comments, or questions for Dr. Johnson to address in future columns, please contact gailhand@q.com

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Pathway to complications

Inflammation underlies Diabetes

We often discuss diabetes as a disorder of blood sugar metabolism. Maybe we should concentrate on inflammation instead.

Total insulin deficiency from auto-immune beta-cell destruction in type 1 diabetes and insulin resistance -- and eventual beta-cell decline in type 2 diabetes -- cause elevated blood sugars. These changes explain what diabetes is. But the true common **pathway for most diabetes complications is inflammation**. High blood pressure and cholesterol disease, common in adults with diabetes, are also part of this inflammatory process.

Disordered blood sugar metabolism, especially in obesity, results in the increase of inflammatory chemicals in the body, including interleukins, leptin, CRP, and tumor necrosis factor. If we think of diabetes as a disease of large and small blood vessels "behaving badly," it's easier to understand the mechanism underlying many diabetes complications.

- When small arteries are damaged, the results are a variety of microvascular diseases; these include retinopathy (eyes), nephropathy (kidneys) and neuropathy (nerves).
- A similar process results in disease of larger arteries, or macrovascular disease. These include heart attack, stroke, and peripheral arterial disease (PAD) of the legs.

Most diabetes therapies target the inflammation that is the final common pathway for many diabetes complications. Aspirin, usually prescribed daily in adults over age 35 with diabetes, is an obvious anti-inflammatory, but other medications used for diabetes, such as **metformin, also have some anti-inflammatory** properties. Likewise, some **blood pressure medications** used in diabetes as well as some medications used for **cholesterol disease** have some anti-inflammatory effect.

The concept of inflammation as a cause of diabetes complications is both the current focus for some new therapies and the consideration of one old medication as well. These could represent novel ways to help manage diabetes to help reduce the risk of complications.

Salsalate, an old, inexpensive medication, is in early trials considered for this use. It was previously used as a pain medication, including for people with arthritis. A 3-month pilot study involving the use of this drug in adults with type 2 diabetes showed positive impact on blood sugar management. If this pans out in larger, longer trials, salsalate would be a potentially effective and inexpensive addition to the treatment options for type 2 diabetes.

Other novel-action therapies are being developed along this line of inflammation treatment in type 2 diabetes. Anti-interleukin-1beta antibody (XOMA 052) **improves insulin secretion** and A1C in type 2 diabetes, the drug is given as IV infusion.

The concept of directly treating the inflammatory process in type 2 diabetes to improve outcomes is interesting, and would certainly complement current treatments. Although these therapies are still only in trials, early results are promising.

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