November 2011

# Steeped!

## Diabetes

November is National Diabetes Awareness Month in Canada, as well as World Diabetes Day on November 14. This month we are looking at Diabetes, and more specifically, prevention of Canada's leading chronic disease.

There are two main categories of Diabetes Mellitus—Type 1 and Type 2. Let's examine the similarities and differences between the two:

| Characteristic | Type 1 Diabetes | Type 2 Diabetes |
|---|---|---|
| **Age of Onset** | Generally before age 30 | Generally past age 30, although it is becoming increasingly more common in children due to childhood obesity |
| **Frequency** | ~10% of Diagnosed Diabetes patients | ~90% of diagnosed diabetes patients |
| **Obesity Associated?** | No— patients can often be quite thin and malnourished prior to diagnosis | Very commonly |
| **Risk Factors** | • Being of Native, Hispanic, Scandinavian or Sardinian descent<br>• Diet —> early exposure to dairy and/or gluten, low vitamin D consumption<br>• Exposure to some viruses (coxsackie, rubella cytomegalovirus, Epstein-Barr, retrovirus) | • Being of Native, Hispanic, Asian, African descent<br>• Obesity<br>• Poor diet (high in fat, refined/processed carbohydrates and food, high in sugar)<br>• Sedentary lifestyle<br>• Hypertension, hypercholesterolemia |
| **Insulin Requirement** | Yes —> the beta cells of the pancreas do not produce insulin | In later stages, although this can be avoided with lifestyle modifications |
| **Prone to Diabetic Complications?** | Yes | Yes, especially if lifestyle modifications are not made |

## The Insulin Connection

Insulin is the hormone that signals the body's cells to open their gates to allow glucose (the fundamental unit of food) into cells to provide them with the nutrients required to function. Without the signal, glucose continues to circulate throughout the bloodstream. The body also has its own mechanisms to protect against starvation: in the absence of glucose in the body's cells, the liver synthesizes glucose out of its own reserves of glycogen (the "stored" form of glucose when the body has more than enough to meet its needs) and secretes this into the bloodstream so cells can uptake this instead of dietary glucose.

The problem in Diabetes is that insulin is not produced so the body's cells cannot uptake glucose (dietary or endogenous). In Type 1 Diabetes, progressive autoimmune destruction of the beta cells that produce insulin means that fewer and fewer cells are able to secrete insulin. Usually someone has enough insulin to function for several years without symptoms, and then they get increasingly ill as insulin levels become insufficient to meet the body's demands as the body's cells are literally starving. At this point one is usually diagnosed with Type 1 Diabetes, and prescribed regular insulin injections.

In contrast, with Type 2 Diabetes the beta cells of the pancreas are able to produce insulin, however the receptors on the cells that would normally respond to the insulin signal have become de-sensitized, usually as a result of

glucose over-exposure from a high-calorie diet. As a result, no glucose is able to enter the cells, the body gets the message that it is starving and signals the liver to produce its own glucose (ie. "Starvation in the midst of plenty"). Thus, the body starts to deplete its stores of glycogen because the cells are not getting nourished, while both dietary and the body's glucose are circulating in the bloodstream to create a state of hyperglycemia (high blood sugar). Prolonged hyperglycemia further damages the body, causing increased urination, excessive thirst, kidney damage, destruction of small blood vessel that causes poor circulation, changes in vision and poor wound healing. The progression of Diabetes can significantly impact quality of life, and is a major factor in risk and complications of other conditions.

## Taking Control of Your Life

Diabetes is *not* a death sentence. It is *not* something that you have fallen prey to, or an illness that you are destined to get just because your father had it. For most cases of Type 2 Diabetes (since it is the most prevalent form), you can do so much to prevent it, and even if you are diagnosed you can significantly improve your health (and actually reverse your diagnosis).

*Stevia rebaudiana* leaf.
Photo originally appears at http://bagbani.yolasite.com/stevia-rebaudiana---the-sweet-plant.php

- Diet - *modifying your diet is the most important factor in the prevention and management of diabetes.* Cutting sugar, refined carbohydrates (like white bread, white rice etc.), lowering saturated fat, eliminating alcohol from your diet will go a long way in preventing blood sugar spikes, and subsequent crashes. Keeping a steady blood sugar will give you more energy and will be less toxic (since prolonged exposure to glucose as in hyperglycemia damages the body). This can be done by eating whole foods (rather than packaged/processed/refined foods), increasing fibre, eating a nutritious diet (complex carbohydrates, fruit and vegetables and dairy if you are not sensitive to it), lean protein, and monounsaturated and polyunsaturated fats (like olive oil and nuts) and having more small, balanced meals more frequently.
- Exercise *breaking a sweat not only reduces your risk for hypertension, obesity, and improves you cardiovascular health, flexibility, strength, endurance and balance, lowers stress and increases your concentration.* The act of exercise (even low intensity exercise in a sedentary individual) actually causes the insulin-mediated uptake of glucose into the cells to be bypassed allowing glucose to enter skeletal muscle cells directly causing a reduction in blood sugar levels without the help of insulin. Furthermore, regular exercise can help to re-sensitize cell receptors to insulin (the main issue with Type 2 Diabetes)
- Weight Loss *obesity, even if you are otherwise healthy, causes insulin de-sensitization which can then lead to Type 2 Diabetes over time.* Weight loss can reverse this, as well as helping to decrease hypertension and hyperlipidemia (often co-morbid with Type 2 Diabetes)
- Natural Products **Stevia** (*Stevia rebaudiana)* is a plant native to South America that is over 250 times sweeter than table sugar and does not raise blood pressure or blood sugar—in fact it may actually help to increase glucose tolerance levels and lower blood sugar! Use in place of sugar in your tea, baking etc. remembering that1 cup of granulated sugar is equivalent to 2 tbsp. of the dried leaf or 1/4 tsp. of the powdered extract.
  **White Mulberry** (*Morus alba)* has long been used by the Chinese as a weight loss agent, and in animal studies where diabetes had been induced in the subjects, it has been shown to help prevent atrophy of beta cells, diminish food cravings, reduce fasting blood glucose, hypertension, lower total cholesterol while increasing HDL cholesterol (the "good cholesterol"), lower triglycerides and improve blood and liver antioxidant levels. Plus, it makes a nice relaxing cup of tea!

Your health is in your hands. Leading a healthy lifestyle is not only the best strategy to manage Diabetes, it is also the best strategy to prevent the onset of many other diseases. In most cases this condition is entirely preventable, and responds very well to committed lifestyle modifications. You can do something about it.

**Keila Roesner, BHSc, ND (candidate)**

*For educational purposes only. This information has not been evaluated by the Canadian Food & Drug Administration.*
*This information is not intended to diagnose, treat, cure or prevent any disease.*

## References

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