

# How sweet it is not

Jennie is a 56 year old stay at home mom, who likely spent more time thinking about her family's health than about her own. It was only after reading a magazine in her doctor's office that Jennie's alarm bells rang; she recognized many of the signs and symptoms that she had been living with for the last couple of years. They sounded just like what the author described as being caused by diabetes: weight gain, thirst at night, and a need to pass lots of pale coloured urine, which was unusual for her. She was also dealing with a yeast infection – something that was also new to her.

A physical examination showed her to be somewhat overweight and, except for a large callus on the base of her left foot, there was little of note. She had been attending the local VON (Victorian Order of Nurses) Foot Clinic at regular intervals to have her nails trimmed and her callus shaved.

After reviewing her signs and symptoms, her physician ordered a fasting blood glucose and a two hour post prandial glucose, as well as a glycated haemoglobin assay. The results were: 8.9 and 17.2 mmol/l and 0.09 respectively. On the basis of these results (which were confirmed), she was prescribed Metformin. The goal was to bring her fasting blood glucose to less than 7, her 2 hour post prandial level to less than 10 mmol/l, and her glycated haemoglobin to less than 0.07. Her family doctor also referred her to the Diabetes Education Unit located at her local hospital. Controlling her diet and taking three Metformin tablets each day (with meals) failed to control her glucose levels and she was put on Lantus® insulin, which brought

her glucose metabolism under control by incrementally increasing the dose. A consultation with an optometrist did not show any evidence of diabetic eye damage, although she did wear bifocal eye glasses.

Recently, as part of her spring cleaning, she decided to wash the windows of her house. This involved the use of a lad-



der. After two days of this work she developed a sharp pain when she walked on the callus. She used an adhesive dressing to cover the area of her foot. This helped relieve the pain but she was concerned that the dressing showed a pale yellow discharge. Accordingly, she went to her local hospital emergency department. A physical examination did not suggest that there was an infection, or if there was, then it seemed to be localized. There was no redness around the callus although it

was cracked – presumably due to the repeated use of the ladder. She had a normal temperature however, since she was an insulin-dependent diabetic, an x-ray was ordered. This showed a bone spur underneath the large callus.

The emergency room (ER) doctor prescribed Cephalexin (Keflex®), 500 mg every 6 hours for 10 days as a precautionary measure, because of her diabetes. She was also referred to a chiropodist to get advice on dealing with her bone spur-callus.

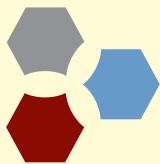
Currently Jennie is doing well and lives a busy life.

### Discussion

The two common types of diabetes are type 1 and type 2. Gestational diabetes, as the name suggests, is a third type that occurs during pregnancy. It usually resolves itself following pregnancy.

Type 1 is usually detected in childhood since the patient is severely deficient of insulin and becomes dependent on daily subcutaneous injection of insulin medication. Type 2 diabetes is also known as adult onset diabetes. Depending on the severity of this type of diabetes, the patient's blood glucose levels may be controlled by weight loss, exercise, and diet control. Failing that, oral medication, such as Metformin, may be prescribed. This drug facilitates the movement of glucose into the person's cells where it is metabolized through the action of their insulin. In some cases, type 2 diabetics require the use of insulin such as Lantus®, which in this case is usually used once a day.

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## Calendar of Events



### The 5th Conference of the Autoantibody Network

September 17 & 18, 2009

Four Points Sheraton Lakeshore  
Toronto, ON

Contact: [www.autoantibodynetwork.com/  
Content/Organizers.aspx](http://www.autoantibodynetwork.com/Content/Organizers.aspx)

### Kenora-Rainy River Laboratory Program Fall Symposium

September 15, 16 & 17, 2009

laPlace RendezVous  
Fort Frances, ON

Contact: Marilyn Rustan  
[mrustan@dh.dryden.on.ca](mailto:mrustan@dh.dryden.on.ca)

### 2009 OSMT Symposium

September 24 - 26, 2009

**“Patient Focused Teamwork –  
Optimizing Your Role in Lab Results  
... an interprofessional symposium”**

Holiday Inn Hotel & Suites  
Sudbury, ON

Contact: [www.osmt.org/conferences](http://www.osmt.org/conferences)

### HealthAchieve2009

(OHA Conference)

November 16, 17 & 18, 2009

Metro Toronto Convention Centre – North Building

Contact: [www.ohahealthachieve.com](http://www.ohahealthachieve.com)

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Diabetics require careful monitoring for complications that may arise, even when their glucose control seems to be satisfactory. Regular measurement of the blood glycated haemoglobin allows the patient's average blood glucose levels to be monitored. Their lipid profile may be measured annually – the low density lipoprotein levels may be high, requiring medication to reduce them. Diabetics tend to have impaired blood circulation and nerve damage.

Eye problems may arise, such as diabetic retinopathy, which, if left untreated, can lead to blindness. People who have diabetes are at increased risk of a myocardial infarction as well as other cardiovascular complications. It has been calculated that about 50% of patients with kidney disease requiring chronic renal dialysis are due to diabetes that has been out of control. A screening test that can detect early damage to the kidneys of a diabetic is called the microglobulinuria test which measures for low levels of albumin in the urine.

Another potentially serious complication of diabetes is the effect that nerve and circulation damage can have on the

feet and skin. As part of the physical examination of a diabetic, special attention may be given to the feet. The doctor may use a pin or feather to look for numbness in the soles of the feet and the toes – a sign of peripheral neuropathy. These patients are susceptible to foot infections caused by bacteria or fungi.

Diabetics are encouraged to monitor their own blood glucose at regular intervals. Too much insulin may cause hypoglycaemia and that could have serious consequences such as seizures and unconsciousness. Conversely, hyperglycaemia can have serious results if not enough insulin is used. In this case a metabolic acidosis may result. This happens when the body is unable to use glucose as a form of energy and instead uses fat reserves. When fatty tissue is metabolized it releases ketones. This is called diabetic ketoacidosis.

Metformin (Glucophage®) is an anti-glycemic agent that is used orally in type 2 diabetes. It works with insulin to control the blood glucose levels. The CPS (Compendium of Pharmaceuticals and Specialties, from the Canadian Pharmacists Association) has two warnings regarding the use of Metformin: Rarely, in about 0.03 cases per 1000 patients, it may cause severe lactic acidosis. The mortal-

ity of this being about 50%. In radiological studies where iodine contrast agents are used, patients are usually advised to withhold Metformin for 48 hours prior to the examination. It has been reported that, in some cases, failure to observe this precaution may result in renal failure and/or lactic acidosis.

Lantus® insulin is an example of DNA technology at work in the pharmaceutical industry. It is genetically engineered in the laboratory using a harmless form of *E.coli*. It differs from human insulin only in a few changes to its amino acid sequences. One advantage of its use is that, in type 2 diabetes it can be limited to only once per day. It is also used in type 1 diabetes. Insulin works by stimulating the peripheral uptake of glucose into fat and muscle tissue. It also inhibits the hepatic production of glucose and inhibits lipolysis.

Cephalexin® is an antibiotic and is one of the first generation of cephalosporins. It is used for a variety of gram positive infections, such as those due to *Staph. aureus* (but not enterococci). The indications for its use include infections of the bone, joints, and soft tissues. About 5% of the population is hypertensive to this drug and severe reactions may occur in a few cases. JLB ❖