

# Jolanta Hordor

## Poland

The nature of diabetes is present in internal medicine specialist at the Clinic for Endocrinology and Diabetes at the University Medical Centre, Ljubljana, Slovenia. Iva, a 27-year old student from Ljubljana, has been dealing with diabetes for the past year. If one falls ill with diabetes, they suffer from a progressive chronic disease that has long-term effects and poses high and inevitable risks for numerous complications. Despite medical progress and more effective treatments, these complications are still quite frequent. Slowly developing complications pose greater risks today. A high blood sugar level can lead to damage to blood vessels. With the small vessels of the retina, the nervous system, and damage to the heart, the most frequent cause of diabetic nephropathy or retinal failure can lead to blindness in the world today. Due to the progression of diabetes, people need to be treated with dialysis, which is a lower quality of life. In addition, poorly managed diabetes can cause damage to the legs and feet, which can lead to diabetic gangrene, amputation, and even death.

ed by Andrej Janez, MD, PhD, Endocrinology and Diabetes at the University Medical Centre, Ljubljana, Slovenia, and Tadej Battelino, MD, PhD, Endocrinology, Diabetes and Metabolism at the University Children's Hospital in Ljubljana, who explained ways of treating the disease in Slovenia and the world. In addition, Iva, a 27-year old student from Ljubljana, who has been dealing with diabetes for the past year. If one falls ill with diabetes, they suffer from a progressive chronic disease that has long-term effects and poses high and inevitable risks for numerous complications. Despite medical progress and more effective treatments, these complications are still quite frequent. Slowly developing complications pose greater risks today. A high blood sugar level can lead to damage to blood vessels. With the small vessels of the retina, the nervous system, and damage to the heart, the most frequent cause of diabetic nephropathy or retinal failure can lead to blindness in the world today. Due to the progression of diabetes, people need to be treated with dialysis, which is a lower quality of life. In addition, poorly managed diabetes can cause damage to the legs and feet, which can lead to diabetic gangrene, amputation, and even death.



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Media

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## Poland

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Inhabitants in Poland: 38,000,000

Source: gov web <http://www.poland.gov.pl/Intro,312.html>

People with diabetes in Poland: 1,134,000

Source: WHO website [http://www.who.int/diabetes/facts/world\\_figures/en/index4.html](http://www.who.int/diabetes/facts/world_figures/en/index4.html)

According to estimates, approximately 1.5 million people in Poland have diabetes.

“Another 1.5 million people have undiagnosed diabetes. About 400,000 people with diabetes are treated with insulin. According to World Health Organisation forecasts, the diabetes incident rate will increase – in 20 years the number of people with diabetes in developed countries may exceed 40 per cent, totalling 350 million worldwide,” writes Jolanta Hodor.

# What is DIABETES?

Jolanta Hodor

Diabetes is a chronic disease whose various symptoms result from metabolic disorders as well as their secondary consequences. The body is unable to maintain the proper level of glucose (sugar) in the blood, which entails chronic hyperglycaemia, i.e. high glucose levels in the blood.

## Disease mechanics

Any meal we have supplies our organism with energy. The basic “fuel” is glucose which circulates in the blood.

Cells in the entire body need energy that is generated from the metabolism of glucose. Any energy surpluses are stored in the liver and broken down between meals.

In order to extract glucose from the blood, the cells need insulin, a hormone produced by the pancreas. If not enough insulin is produced, our cells cannot function properly.

Diabetes is a condition in which the pancreas does not produce insulin or produces it when it is not needed, or in which insulin by itself does not function properly.

If it is not metabolised, glucose accumulates in the blood and keeps stocking up after every meal. Excessively high blood sugar levels gradually damage blood vessels and the nervous system, leading to late diabetic complications.

## Types of diabetes

There are two main and most frequent types of the disease: type 1 and type 2.

Type 1, or insulin-dependent diabetes

In this case the pancreas is damaged and does not produce insulin. The disease usually, though not always, manifests itself in young people or children, and develops very quickly

– between two weeks and several months. The likelihood of developing diabetes is genetically conditioned, but some external factors, such as viruses, chemical substances or drugs, may cause a reaction in the body leading to the development of type 1 diabetes.

In type 1 diabetes, in spite of a high concentration of glucose in the blood, the body keeps producing it from proteins and fats, which may lead to acidosis and coma.

### Symptoms observed in type 1 diabetes:

- increased thirst
- frequent and profuse urination
- weight loss in spite of increased appetite
- sleepiness (but excitement and concentration difficulties may be experienced as well)
- recurrent skin and oral cavity infections
- impaired visual acuity

Type 2 diabetes

This is the most common type of the disease (it is called insulin-independent), accounting for 80-90 per cent of all cases. It usually manifests itself at an older age.

Also in this case the pancreas is damaged, but the disease develops at a much slower rate than with type 1 diabetes. Insulin is produced, but it is not secreted in sufficient amounts while glucose levels in the blood increase. It may also be less effective, and consequently blood cells may not get enough glucose.

In type 2 diabetes, insulin deficiency is not total, however. The concentration of glucose in the blood increases slowly and the body can, to a certain extent, become adjusted. The symptoms may therefore be similar, but experienced with much less intensity than in type 1 diabetes.

### Main contributing factors to type 2 diabetes:

- obesity – the incidence of diabetes in obese persons is four times as high as in persons with normal weight
- sedentary lifestyle
- poor diet – especially excessive consumption of high-energy foods, animal fats, carbohydrates and refined sugar
- arterial hypertension
- inflammation of the pancreas

Type 2 diabetes is, to a certain extent, also hereditary – vulnerability to the disease is genetically conditioned.

### Most dangerous – complications

When not treated or improperly treated, diabetes can lead to very serious complications. Excess sugar levels damage blood vessels and nerves.

### Check your sugar level

#### Healthy person

PANCREAS production of insulin

#### Type 1 diabetes

PANCREAS no insulin

#### Type 2 diabetes

PANCREAS insufficient production of insulin or abnormal insulin activity

### Blood sugar levels in a healthy person:

- In a fasting state and before going to bed 70-90mg/dl
- After meals 70-135mg/dl



#### Novo Nordisk Youth Panel

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Novo Nordisk Youth Panel is a part of the Novo Nordisk Young Voices Changing Diabetes Programme. It consists of a group of young people that advise Novo Nordisk on how to communicate health awareness messages to children and young people.

### The most serious (late) complications of diabetes are as follows:

- diabetic nephropathy, or kidney damage
- diabetic retinopathy, or damage to small vessels in the eye, which can lead to sight loss
- circulatory diseases
- myocardial infarction
- cerebral stroke
- diabetic foot – which if not treated properly may end in limb amputation
- neuropathy – damage to the nerves, which results in painful sensory and motor disorders

Diabetes should be suspected in, among others, persons experiencing an intense increase in thirst and increased daily urine volume.

### How can it be treated?

Type 1 diabetes cannot be completely cured. What can be done is only to treat its symptoms by supplying insulin which the pancreas does not produce at all.

With type 2 diabetes, on the other hand, treatment usually begins with changing the diet. If this is not enough, an oral therapy is implemented – the patient takes drugs that improve the function of the pancreas. If this does not work either, insulin is introduced. Frequently, however, with type 2 diabetes a changed diet and loss of weight are enough to avoid insulin therapy. On the other hand, a delay in introducing it may lead to complications. With type 1 diabetes, insulin must be administered from the very beginning.

### Insulin therapy

The physician may prescribe insulin or insulin preparations that are identical to the insulin produced by the pancreas of a healthy person. The therapy is adjusted to the needs, lifestyle and expectations of the relevant patient. Insulin therapy may be combined, conventional or intense. There are several types of insulin preparations, differing in the rate of absorption and activity.

### Insulin is a ...

hormone produced by the pancreas, responsible for glucose levels in the body. It was discovered in 1922, and soon afterwards it was introduced as a therapy; initially, animal insulin was used. In 1979, synthetic human insulin was obtained as a result of genetic engineering from bacteria with the addition of human genes (at present, only human insulin is used). Studies used to focus on finding a method of making the insulin release resemble

the natural process as much as possible. Long-acting insulins were first manufactured in the beginning of the 1980s. The latest step in the treatment of diabetes is the introduction of insulin analogues.

The appearance of individual glucometers at the end of the 1980s was immensely important for the safety of people with diabetes. The effectiveness of treatment increased with the introduction of more advanced techniques for administering insulin – today it is not only simple and extremely precise, but even pleasing to the eye.

### Human insulins

- short-acting insulins, with peak activity between 1 and 3 hours after being administered; active for up to 8 hours;
- medium-acting insulins, with peak activity between 4 and 12 hours after being administered; active for up to 24 hours;
- insulin mixes, including short and medium-acting insulins in a variety of combinations

### Human insulin analogues

They have the biological properties of insulin, and owing to their modified particle structure, their activity profile is more physiological. They are obtained through genetic engineering. They can also be broken down into short and long-acting insulins and analogue mixes. The advantage of analogues over conventional insulins is that they can be administered immediately before or after eating, without the need for snacks.

In conventional insulin therapy, a strict regime must be observed – insulin is injected 30 minutes before the main meal. And it is better to pre-plan its composition and amount, so that the dose can be adjusted properly. Analogues may be used after meals.

Analogues are more expensive than conventional insulin, but they are also reimbursed. They are therefore recommended especially to people who work and lead active lifestyles, to people who find it difficult to maintain a regular diet and to children, whose appetites can be difficult to know and foresee.

### Can it be avoided?

Dr Agnieszka Petrulewicz, diabetes specialist

We do not know exactly what causes diabetes, in fact – the mechanism has not been fully understood, the direct relation between a specific gene or set of genes and the disease has not been discovered. Some people do have a congenital susceptibility to diabetes.

Type 1 diabetes, which is an autoimmune disease, cannot be avoided. This type of diabetes is much less frequent, however, than type 2, which can largely be prevented. All studies show that the most effective form of prophylactics in the case of type 2 diabetes is changing the lifestyle, which means eating fewer calories and maintaining a healthy weight. Plus plenty of physical activity – 30 minutes of intense activity three times a week is the recommended standard. It has been demonstrated that this helps reduce the risk of developing type 2 diabetes by half. Moreover, with reduced weight, a healthy diet and physical exercise, persons already taking antidiabetic drugs are often able to reduce the amount of drugs they take, or even discontinue them completely. Unfortunately, what seems so easy to be done turns out to be the most difficult for us.

### Reflections on the glucometer

6 a.m. I wish I could sleep some more, but I have so much to do. First, the glucometer – a prick, a drop of blood on the strip. OK, it's normal.

Now the injector. A shot of insulin – quickly, breakfast not sooner than in half an hour, I cannot be late for work today...

On the go all day long. I forgot about a snack. Something must be wrong with the sugar, I am breaking out in a cold sweat. The glucometer confirms that. Maybe I should have a sweet? It will absorb fast. And the doctor has told me so many times I should be careful.

Another shot of insulin. Now I must have lunch. I'm eating out today, unfortunately. How many calories are there in this soup? What was it made from? We'll see. I will take my sugar level in two hours. And it will go on like that all day long. The last shot in the evening, the last measurement before going to bed.

I must see a doctor, I am not sure if all things are adjusted properly. I am not going to take any chances, as I did last time. I thought I would die of thirst and that my heart would jump out of my chest. Maybe I will be lucky enough to get an appointment this month. I hope the doctor will not prescribe too many drugs, though, I now spend 200 zlotys a month. You never know which prices will go up, how much I will have to pay for the glucometer strips, how much for the insulin, not to mention other drugs.

I am so glad Gosia has told me about that new pharmacy. Everything is cheaper there. I will never be able to understand how the same drug can cost 10 zlotys in one pharmacy, and 30 zlotys in another. I think that is possible only in Poland. And then they are surprised that some people reduce their doses of insulin to save money, even though they know they will end up in hospital or with a severe handicap.

It is not their fault, though, that the decision-makers cannot see what pays more – to provide more help today, or to spend several times as much later...

### Tables on the plate

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Every person requires a certain daily dose of insulin, depending on their weight, food intake, and physical effort. A person with diabetes needs to know how much energy, carbohydrates, proteins and calories a product contains.

Carbohydrates, however, divide into simple and compound sugars. Simple sugars, contained for example in sweets, honey, juices or milk, cause a fast increase in blood sugar level. Compound sugars (such as bread, vegetables, rice, potatoes) are safer, as they are absorbed at a slower rate. To facilitate the control of carbohydrate intake, the notion of carbohydrate exchanges is applied – these are portions of food (in grams) containing 10 grams of assimilable carbohydrates.

At first, people with diabetes must weigh all their food – they receive special tables with the

nutritional value of all food products. Regular training improves your accuracy, however – eventually even without the tables they know how many calories are contained in a slice of bread or a serving of roast chicken. It is difficult, however, to avoid problems with new dishes.

People with diabetes should eat regularly, so that their blood sugar levels are not disturbed. If they are taking insulin analogues they do not need to have snacks between meals. Everyone should have three main meals a day, according to the old principle – huge breakfast, light supper. ■

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## This is my story: I live with diabetes

Edyta is 29. she has had diabetes for 18 years.

"I was diagnosed with diabetes when I was still a child, and I thought it was the end of the world, that I would not have a chance to live like other children."

Edyta got ill when she was 11. She was terrified of syringes.

Insulin therapy was very different then from what it is now. I was terrified with the very look of syringes. I did not want to accept the whole situation, but my parents did everything they could to teach me how to live with diabetes.

Today I am grateful they put all the burden of the treatment on me, although at that time it was all scary and very difficult.

Considering the level of healthcare provided 18 years ago, people with diabetes were not safe. There was no education either. Old insulin injectors were very imprecise, and a child, after all, needs small doses.

Blood levels were measured back then once a week, there were no individual glucometers. No matter what I did and how much I ate, the dose was the same, so there were always problems, I felt unwell very often. Then came the time of rebellion. I wanted to go to the discos, have fun and not think it was time for another injection or that I had to eat something or I would faint. I wanted to live a normal life – without the huge bag full of needles and ampoules at my side.

My friends at school did not even know I had diabetes. I was perfect at hiding it. I did not want to be treated differently. I did not go on any trips or to summer camps. In fact, I never went anywhere – I always needed a hospital

nearby, because something could happen at any time. Finally, at one point, I stopped taking insulin altogether.

I ended up in hospital, and that was a turning point in my life. I stood face to face with death – doctors said if my parents had brought me in a few hours later, I might not have been saved.

When I saw the fear in the eyes of my near and dear ones, I thought: "The only person who can help me is myself. If I do not get a grip on myself, I will not get anywhere in my life." And I did get a grip on myself. I finished high school, a nursing school, and then college – healthcare education.

My life is not any different from the lives of my peers – I have a job I like very much, I travel a lot, I have a boyfriend and I will surely have children, one day. My schoolmates did not know about my disease until recently, after a couple of interviews I gave to help other people with diabetes. I do not let everyone know I have diabetes, though – this is my private stuff. I have diabetes, other people have other diseases, and we all have to deal with it somehow. That's life – easier for some, harder for others.

Hanna was less lucky. She has also suffered from diabetes since her childhood, but in her case it is not a dozen or so, but 40 years. She has not been able to avoid the most serious complications: The treatment that was available then only prevented death. There were no possibilities like those offered today. This simply cannot be compared.

After all, the first individual glucometers appeared in Poland at the end of 1980s, and even then they were imported from abroad.

Anyway, for me the progress in medicine

came too late, though I am happy to have had the longest experience in fighting the disease in Poland.

Due to diabetes I have lost my sight, and my body is so ruined that I no longer feel the regular complications of unstable sugar levels, like glycaemia. I do not experience rapid fits of thirst, which are typical in diabetes.

In the past, however, when there were no glucometers, I had such fits – I could drink an ocean of sweet water and even that would not quench my thirst. I do not experience trembling hands, vertigo, or perspiration.

If any alarming changes happen in my appearance or behaviour, my family or friends tell me. And then I quickly check my sugar level. I cannot check it every hour, after all.

I do have a glucometer for the blind. After 40 years, my skin is so pricked, though, that every new prick is a serious problem, even though in healthy people modern glucometers would not even leave a sign on the skin.

And this is just one of many problems. The most important thing for a person with diabetes is support. Before I lost my sight, I worked as an assistant at Warsaw Agricultural University. And when that happened, my superiors asked me if I wanted to continue working. For a sick person, work is something really important, not only because they need a lot of money to be able to fight the disease on a day to day basis, but primarily because it gives meaning to your life. I was offered a new position, created especially for me, I received a speaking computer so I could continue my academic work... Such help from the outside is very important, few employers, however, do for their employees what the University has done for me. ■