What I tell my patients about diabetes

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People become diabetic when the sugar in their blood is too high. Diabetes often shows itself by the appearance of sugar in the urine. This happens when the sugar level in the blood is so high it spills out through the kidney and passes into the urine. Sugar levels in the blood are controlled by insulin. Insulin is normally made in the pancreas and it allows the body to make use of the food we eat.

There are two types of diabetes. Type 1 diabetes is when the pancreas makes no insulin, or very little, and injections of insulin are required to control it. Type 2 diabetes starts gradually with not enough insulin to keep the blood sugars in the normal range. This is due to a gradual failure of the pancreas to produce insulin and to insulin resistance. Insulin resistance means that the insulin that is produced doesn't work as well as it should. This may be controlled by diet. However, this is not always enough on its own and tablets may be needed.

What are the symptoms of diabetes?

The following are usual, however, some with type 2 diabetes do not experience sypmtoms:

- When the sugar overflows into the urine it takes more water with it, and so more urine is produced, causing frequency in passing urine.
- Taking water from your body makes you thirsty.
- The sugar in the urine also takes more salts, which can cause cramps. Sugar itself is energy and by losing the energy you lose weight.
- If this were to continue unchecked then you could get so dry that you become dehydrated. Those with type 1 diabetes could then become very ill because of the lack of insulin.
- The body's defence system is less able to cope with infections, particularly from yeasts, which can cause irritation of the skin, penis or vulva.
- High and varying glucose levels can cause blurring of eyesight, resulting from changes to the shape of the lens in the eye.

What happens to your own insulin?

In both types of diabetes researchers have been able to find and study people before they develop symptoms. In those with type 1 diabetes, before the onset of symptoms they develop antibodies against the insulin producing cells (islet cells) in their own body. Defence cells also gradually destroy these islet cells. It is possible to have normal glucose levels while this is happening. At a later stage, the glucose levels will be slightly raised and could be controlled with diet. Finally, insulin injections will be needed.

Before type 2 diabetes starts, more insulin than usual is produced because of the insulin resistance. Gradually, the amount of insulin decreases and then the sugar levels increase until diabetes occurs. This decrease in insulin levels continues and treatment with tablets has to be increased until insulin therapy is started – even then the amount of insulin needed will increase with time.

What are the complications?

Either type of diabetes can cause problems if it is not under control. Problems may arise with eyesight, the kidneys and nerves. There are also potential problems with blood vessels which can lead to heart attacks, stroke and poor circulation to the feet. Diabetes increases the chances of these complications by increasing the risks from smoking, hypertension (high blood pressure) and cholesterol. Therefore, it is important to keep these other factors controlled.

Either type of diabetes can cause problems if it is not under control

Your blood pressure should be below 140/80 mmHg. High blood pressure is improved by tablets but also by exercise and diet. Exercise should be vigorous, at least three times a week, lasting each time for half an hour. You should reduce the amount of salt in your diet and take more fruit and vegetables (five portions a day as well as potatoes), and if necessary reduce your weight. If your blood pressure remains high despite these changes you may need to start taking some tablets.

Your cholesterol should be below 5 mmol/l. Cholesterol control is also helped by exercise and diet. By reducing the total amount of fat, and taking more monosaturated fats, such as olive oil, harmful cholesterol can be reduced. If your cholesterol remains high then you should discuss this with your doctor. You may need medication to reduce it.

You should also speak to your GP about taking aspirin – providing that you do not suffer from indigestion or ulcer problems. Most people above

the age of 40 with diabetes benefit from a low dose of aspirin (75 mg daily).

Eye problems

With long-term, poorly controlled diabetes abnormalities of the small blood vessels, which feed the retina, can occur. The retina is situated at the back of the eye and acts as a photographic plate on which images are reflected. If a small blood vessel is blocked and the blood cannot get to a part of the retina, it then dies and images cannot be seen in that area. If a leak develops, the leakage can, in rare cases, include opaque material which stops light reaching the 'photographic plate' and causes blindness of that particular area. In the early stages of deterioration, little abnormality can be found. Later, colour vision is affected, and it becomes difficult to read. If this is left unchecked blindness can follow, but if detected in time treatment prevents any further deterioration. The treatment is called photocoagulation and involves a laser beam.

Glucose levels in the blood can be tested at home using a glucose meter

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Nerve damage

Nerve damage becomes apparent as weakness or a loss of feeling in the feet and occasionally the hands. Sometimes there is dizziness and difficulty in going to the toilet. The feet may suffer 'pins and needles' or 'burning' pains. This can occur in all of us at times if we sit in one position for too long. However, in the diabetic with nerve damage (neuropathy) the tingles are constant. If you suffer from any of these symptoms please let your doctor know, since there are treatments to help you.

Impotence

This is a problem that some men with diabetes develop. Mention this to your doctor, since there are various causes, and treatments are available.

Nephropathy (kidney problems)

Kidney damage from diabetes is the most common cause of renal failure that requires dialysis in England and the USA. In order to detect any problems early your urine will be regularly checked for protein.

Diabetes needs a team to manage it

You should be the team leader! There are specialist nurses based in most hospitals or in community centres to help you understand how to treat your diabetes. Specialist dietitians will either help you directly or through reaching other team members. You may also meet podiatrists and chiropodists who will help you to care for your feet. You will probably see more of your GP and practice nurse than the specialist team. They will help you to monitor and adjust treatment and perform an annual 'MOT' to make sure that you have no complications.

How do you know that your diabetes is controlled?

We measure diabetes control in a blood test called haemoglobin A1c (HbA1c). The result is given as a percentage and is an average of your own tests over three months. It is an important measure because if your result is higher than normal then the chances of developing complications are increased. This increase can be quite marked. For example, a 1% increase in HbA1c increases your risk of kidney disease by 30–50%. Any lowering of HbA1c lessens the chance of complications. If your HbA1c is too high you probably need more treatment for your diabetes – although you should always take care with your food, both the amount of food and when you eat it.

In the bloodstream glucose sticks onto the haemoglobin pigment in the red blood cells which then forms HbA1c. Since each red blood cell normally lasts for eight to 12 weeks, a blood sample will show what your average is for about this time. There are two methods that you can use yourself to check that your treatment is working. Each has advantages and disadvantages.

Urine testing for glucose

A plastic stick can be dipped into a sample of of urine. It is then left for the correct time, and the colour on the stick compared with that on the container. It should be negative nearly all the time.

Blood testing for glucose

There are a series of strips for testing blood, and a variety of meters. You should talk to your doctor or nurse before you buy a meter, and it may be best to see all the range that is available. The principle is that the glucose in the blood reacts with chemicals on a plastic strip to make a colour change.

You should write down the result of either of these tests in relationship to the time that you last ate. If the tests following any one meal are too high or too low, then you can alter the amount you eat, or adjust your treatment to improve the levels.

People sometimes argue about which test is best. Remember that the most important test is how you feel, followed by your HbA1c result.

Diet and diabetes

You should try to eat the kind of healthy diet recommended for everyone. You should have good amounts of high fibre, starchy foods, fruit and vegetables and be careful about fat and sugar. You should also eat regular, small meals – breakfast, mid-morning snack, lunch, mid-afternoon snack, evening meal and bedtime snack. It may be necessary for you to cut down on the amount eaten at main meals to allow you to eat the between-meal snacks to stay a healthy weight. To make sure you get enough of the necessary nutrients choose foods from each of the following groups every day:

- Dairy produce – milk, cheese, yogurt
- Meat, fish, eggs and pulses
- Bread, breakfast cereals, rice, pasta, potatoes and chapatis
- Fruit, vegetables and salad.

Not all people with diabetes will need the same diet, so it is important that you listen to the individual dietary advice that you are given – remember to ask if you are not sure. Special diabetic foods are not necessary – just try to be sure that they are low in sugar, low in fat and high in fibre.

If your weight is in the ideal weight range then diabetes is easier to control. If you need to lose weight then lowering fat and sugar helps, but it may be necessary to reduce the size of the portions of starchy foods. If your weight remains a problem, you can get help from a dietitian. If you are above your ideal weight your long-term health could suffer.

So, what about the tablets?

If your diabetes cannot be controlled with diet alone, then you will need treatment with tablets. There are several different types of tablets and your doctor will prescribe one suitable for you:

- Sulphonylureas and other tablets which encourage insulin secretion such as gliclazide, tolbutamide, glipizide, glimepiride and repaglinide may be prescribed. These tablets are taken before meals (between 15 and 30 minutes beforehand). They work by encouraging your pancreas to make more insulin. They can only work if your pancreas is able to make insulin. You usually start on a low dose (one tablet a day) and then gradually increase the dose. If you take your tablet but do not eat, then you could become too low in glucose (hypoglycaemic), so always carry some sugar with you.
- Metformin works in a different way from the sulphonylureas. These tablets are taken with food and do not cause hypoglycaemia if taken alone. Some people experience side-effects such as feeling sick or diarrhoea. If you gradually increase your dose this lessens the chance of these side-effects. If you have problems with diarrhoea go back to the dose of metformin that you could manage.
- Acarbose alone also does not cause hypoglycaemia. The dose is gradually increased in a similar way to metformin until the diabetes control is good (up to a maximum of 200 mg three times a day). Some people cannot take acarbose because of side-effects. These include wind and stomach upsets. These tablets need to be taken with the first bite of food.

All of these tablets can be taken together if necessary and sometimes are taken in combination with insulin treatment.

Someone with type 2 diabetes which is not controlled by diet and is overweight is usually asked to start metformin. If weight is not a problem then a sulphonylurea is usually best.

Insulin treatment

Some people with diabetes need insulin to control their diabetes and without insulin quickly become ill (type 1 diabetes). If you belong to this group of patients it is important to be aware that you could become ill very quickly without your insulin injections. Others need insulin because the diet and tablets are no longer working well enough. These people may not notice any immediate change in how they feel if they stop insulin injections (type 2 diabetes). Finally, some people who are usually controlled with diet or tablets may require insulin if they become ill or pregnant or need surgery. This is usually only temporary and the tablets can be restarted when their condition has changed.

Insulin can be obtained from cows (beef insulin); pigs (porcine); or synthetically made into human insulin either from pigs (empirical) or artificial genetically engineered (GE); or made from yeast (PYR). Finally, new very quick acting insulins have been engineered.

What is a hypo?

Insulin works by lowering the level of glucose in the blood. If you take too much insulin the blood glucose falls too low, producing hypoglycaemia (this is often abbreviated to hypo or called a reaction) – in extreme cases this can lead to unconciousness if left untreated. This needs to be treated with sugar or glucose urgently. With time your body breaks down the injected insulin and glucose levels will gradually be restored, allowing you to wake up.

Common warnings of a hypo are:

- Headache
- Sweating or feeling hot
- Trembling
- Tingling around the lips and tongue
- Weakness
- Palpitations

Are you having problems coming to terms with your diabetes?

Initial reactions may include:

Shock
Relief
Denial
Grief
Problems with acceptance.

Possible longer term problems are:

Anxiety
Depression
Anger
Restrictions from treatment
Problems taking the treatment
Sexual difficulties.

- Tiredness
- Hunger
- Feeling sick
- Anger/bad temper
- Slurred speech
- Staggering walk
- Blurred or double vision.

Carry sugar or glucose tablets (which you can buy at a chemist) with you, so that you can give yourself treatment if you feel that a hypo is coming on. If you feel hypo take three glucose tablets – do this straight away rather than waiting for food or checking blood tests. If it does get worse and you become unconscious, then people must not try to force sugar into your mouth because you may choke. You will need medical attention. Carry an identity card with you so that other people can treat you if a hypo has occurred.

After you have taken your sugar tablets you must also remember to eat something like a sandwich because the effect of the sugar will not last long.

Key points

- **There are two types of diabetes. Type 1 diabetes is when the pancreas makes no insulin, or very little, and injections of insulin are required to control it. Type 2 diabetes starts gradually with not enough insulin to keep the blood sugar in the normal range.**
- **There are a number of possible complications with diabetes including problems with eyesight, the kidneys, nerves and blood vessels.**

What happens if you need insulin?

You will be given lots of support: but first you must learn how to inject yourself. This is important so that you can overcome your worries about injections. Often I show my patients how to do it by injecting myself, then ask them to copy me.

Once you have given yourself an injection you can settle down to learning how to adjust your treatment yourself.

Coming to terms with your diabetes

There are several psychological responses to the diagnosis of a chronic disease. If these become unmanageable despite help from family friends and healthcare workers, then you may possibly experience longer term problems. These can include continuing anxiety, depression, anger, sexual difficulties, self imposed life restrictions, self imposed problems with compliance with treatment and monitoring. If these affect your life then you may find it helpful to consider coping methods. You may be able to do this on your own but you may need to discuss this with a psychologist.

How can you adjust to diabetes?

Useful ideas include the following:

- Seek out more information: but remember to discuss this with your team
- Set yourself achievable goals: perfect HbA1c is not always realistic for everyone – take your lifestyle into consideration
- Start activities that you find give you pleasure: you may have thought that you should stop something you like. Discuss it with your team.
- Learn to relax
- Keep talking, particularly to friends and family
- Think positively
- Give yourself time to adjust to the changes needed
- Expect bad days – and good ones
- Ask for help – from friends, family, the team or clinical psychologists.

There is a lot to learn to help you manage your diabetes. Take time to ask questions and you will find that you are controlling your diabetes rather than letting your diabetes control you! ■

For further advice about diabetes and membership details for Diabetes UK contact:

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