Module 1 - The Nature of Type 1 Diabetes

Introduction

The aim of this module is to allow the learner to have an understanding of type 1 diabetes, how the body is affected by the illness and what can cause diabetes.

Learning outcomes – the learner will:

- Have a knowledge of diabetes, especially type 1 diabetes
- Have an understanding of insulin and how insulin works in the body
- Have a knowledge of the role glucose plays in the body
- Gain a comprehension of the pancreas, where it is situated and its purpose
- Have an understanding of how diabetes affects the young.

What is diabetes?

Diabetes is a serious health condition where the amount of blood glucose in the body is much higher than its requirements. Consequently, the body cannot use it as efficiently as it should do. This is due to the pancreas - a small organ that is situated behind the stomach, either not producing any insulin or it doesn’t produce enough insulin - this all depends on the type of diabetes a person has. Fundamentally, there are two types of diabetes: type 1 and type 2. It is a common degenerative health problem for people all over the world, both male and female.

Although diabetic symptoms and the conditions that are associated with diabetes can be treated to a certain extent, unfortunately there is as yet no known cure. It is crucial to spot the symptoms of diabetes sooner rather than later. This is to prevent any of the many serious complications associated with the condition developing, or progressing further, in service users that already have some of the serious problems linked to diabetes.

Although the name is similar, there are significant differences between the two conditions. Type 1 diabetes is also known as insulin dependent diabetes mellitus. It is very often referred to as juvenile diabetes as it occurs usually at birth, at a young age or before the age of forty. However, there are some exceptions to this. It is a much rarer form of diabetes and the symptoms can develop extremely quickly. The symptoms can present themselves within days or weeks.

Type 2 diabetes occurs in men and women and is known as non insulin dependent diabetes mellitus. The symptoms of type 2 diabetes show in the service user a lot slower than they do in type 1, and in some cases service users don’t know they have the condition. A routine health check often discovers diabetes type 2.

This condition is often found in people who are older than forty and overweight. Nevertheless, with sedentary lifestyles, availability of fast foods 24/7 and lack of physical activity, people are developing diabetes type 2 at a much younger age. Sadly, with the expansion of
technology and computer games and video game consoles people are less active and more immobile than they were. Some children prefer to sit and play a football game on their console rather than actually being outside kicking a football around. This is encouraging an inactive lifestyle for the future. High fat and high calorie snacks have a part to play too in increasing the risk of developing diabetes. As the range of unhealthy snacks increase, so does the waistline.

**Type 1 diabetes**

Type 1 diabetes is a very serious illness and the symptoms can show themselves dramatically. A sudden weight loss is the most commonly noticed symptom of diabetes type 1. This illness is recognised as an auto-immune disease. This is due to the body destroying the cells that produce insulin. As a result, no insulin is being made. Therefore type 1 service users have to inject insulin into themselves to stay alive. Insulin was discovered in 1922. Prior to this children with type 1 diabetes had no chance of survival. Thankfully, with modern technology and research into the condition, people are living longer and with a better quality of life than they did before the discovery of insulin. However, it is still very important for the sufferer not to take this illness lightly and for them to take care of themselves and to understand the severity of their illness.

With this type of diabetes the body needs to rid the excess glucose and does so through the kidneys. It does this by passing lots of urine. This is because the cells will not allow the insulin to enter; therefore the body needs to rid the glucose one way or another. Type 1 diabetes accounts for 15% of all cases and great care has to be taken with type 1 sufferers. If they don’t take their insulin they will be very ill and other serious complications will develop. It isn’t just a case of taking a shot of insulin everyday; there are many other factors to consider to live a healthy life. The diet has to be looked at, eating lots of refined carbohydrates, sugar and fatty foods will increase the risk of heart disease.

The service user has to take regular exercise too and they also have to have frequent checkups with their doctor to ensure that everything in the body is working the way it should be, such as the kidneys. Regular screening eye tests check that diabetes isn’t causing problems with the eyes which can lead to blindness. It is important that the service user attends all of the tests allocated to them. Other tests are usually performed by the diabetic nurse to ensure that the service user’s feet are healthy.

Unhealthy feet in a diabetic is more than just a callus or a corn, it can be life threatening if left untreated. The diabetic care team monitors the blood glucose of the service user and also discusses the service user’s medication to see if it is working correctly or if it needs altering in any way. Service users have numerous areas on the body where they can inject the insulin, which include the buttocks, thighs, stomach and upper arms. Some service users inject in the same place all the time. The problem with this is that it can create bruising. It is also likely that there will be fat deposits under the skin if the injections are inserted in same place all the
time. This makes the skin look lumpy and also delays the absorption of the insulin. There are many forms of injecting the insulin; this can be by a syringe, insulin pump or a pen device. The injection has to be inserted just under the skin so the needle is only a small one. Unfortunately insulin cannot be taken as a tablet form as it is a protein and would be digested in the stomach before it had the chance to do its job. There are other forms of giving insulin being invented but as yet they are not available.

It can be a very anxious time for the service user who has been informed that they have diabetes, so to be told that they have got to give themselves injections every day can be particularly distressing. Nevertheless, over time the procedure becomes straightforward and a part of their daily life. Plus many service users say how much better they feel since they have been taking insulin as now their blood sugar levels are more controlled.

The exact cause of type 1 diabetes is not known, however it is thought to run in families, be triggered by a virus such as rubella, mumps, measles, polio, encephalitis, Epstein Barr virus, or some other auto-immune disease. Unlike type 2, type 1 is not at all due to the lifestyle of the service user.

Type 2 diabetes

Around 85% of the diabetic population has type 2 diabetes. Many people don’t even know they have the condition, as in some cases the symptoms are not severe enough for the person to think that there is a problem. What happens with this condition is that either the insulin that is produced by type 2 diabetics is not working properly or the body isn’t producing enough of it. Diabetes is more common in the Native Americans, the Hispanic, Latino population and people of the Asian community.

Unlike type 1, type 2 diabetes can, for some service users, be treated with diet and lifestyle change alone. Other service users have to take tablets to reduce their blood sugar level as well as eating a healthy diet and taking regular exercise. A number of service users find that this just isn’t enough to control their blood sugar level, and insulin has to be administered. It is possible to be a type 2 diabetic and have to take daily insulin injections. This is usually due to the fact that with diet, exercise and tablets the blood sugar level still cannot be controlled.

Understanding the pancreas

The pancreas is a small organ that sits just behind the stomach. It is sandwiched between the stomach and the spine and sits close to the gallbladder and the liver. It is an organ of the digestive and the endocrine systems. It lies in the upper part of the abdomen and consists of a tail, body and head and is approximately six inches long. This yellowish coloured organ makes insulin and secretes digestive juices into the small intestines. This helps to break down food that has left the stomach.
What is insulin?

Insulin is a hormone that is produced by the pancreas. It allows the glucose to enter the body's cells. These cells are called the islet cells. This is where it is used as a fuel to give energy. Insulin regulates the amount of glucose that enters the blood. If the body didn’t have any insulin at all, you could eat lots and lots of food but still be in a state of starvation. This is why people with undiagnosed type 1 diabetes lose so much weight.

What is glucose?

Glucose is a form of sugar that is found in the blood. All the cells and organs within the body need this energy source. The glucose in the blood comes from the foods we eat, mainly carbohydrates such as bread, pasta, fruits and vegetables. Once eaten the digestive system breaks the foods down, which then travel to the liver. The liver then turns the consumed carbohydrates into glucose. The glucose is stored in the liver and the muscles as glycogen. This is then carried throughout the body providing the cells with the fuel. This process stops the body from using fat as an energy source. To explain in more detail; when we place certain foods such as bread, beans, potatoes, sweets, pasta, rice, biscuits, cookies or sugar into our mouth, these foods, which are either sugary or starchy, are chewed and then passed through the oesophagus. The oesophagus is the tube that lies from the throat down to the stomach. This chewed up food has already begun the digestive process as the digestive enzymes in the saliva have started to break it down.

The next stage of digestion is when the food reaches the stomach and is then churned up and mixed with juices from the stomach and the stomach acid. Due to the acid in the stomach a lot of bacteria are now killed off. This process also helps to break down the food even further. The subsequent stage of digestion is when the food is pushed into the duodenum. The duodenum is a short but thick portion of the small intestines. The bile that is produced by the gallbladder is now mixed in with the food. As the food progresses through the jejunum and the ileum it resembles a thin soup. The jejunum and ileum are also parts of the small intestines. They are the longest section of the small intestines. As this process continues the glucose is then absorbed through the bowel wall and into the bloodstream.
Module 1 – The Nature of Type 1 Diabetes

ACTIVITY 1

Explain your understanding of the word 'degenerative'.


ACTIVITY 2

Why do you think that complications should be prevented in sufferers? Wouldn't it be better to treat the problems as they occur?
**ACTIVITY 3**

In your own words, explain how type 1 diabetes can be prevented and how it should be done.

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**ACTIVITY 4**

In your own words explain your understanding of why diabetes occurs.

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