



Introduction to Physiology (BMHP5003_LON)

Assessment Component 1

Poster Presentation

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Learner declaration

This assignment is my own original work. No part of this work has been copied from any other source or person except where due acknowledgement is made, and no part of the work has been previously submitted for assessment at this or any other institution. I have read the Student Academic Integrity Policy and understand its implications.

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What is Diabetes?

- Diabetes is a lifelong medical condition caused by high levels of glucose (sugar) in the blood. (nhs.uk, 2021)

How Does This Happen?

- There are 2 main types of diabetes.
- Although they both ultimately lead to high blood sugar levels, they have different causes.

Type 1 Diabetes:

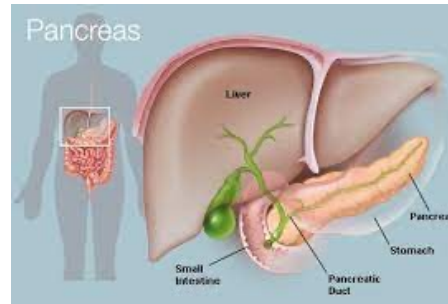
- High blood glucose levels as a result of lack of a hormone called INSULIN which is produced by the pancreas.
- Occurs mostly in younger people and accounts for about 8% of all diabetes cases.
- Genetic and therefore can not be prevented by lifestyle changes. (Diabetes, 2021)

Type 2 Diabetes:

- High blood glucose levels because the body does not make insulin well or does not use the insulin produced.
- Occurs mostly in adults and accounts for 90% of all cases of diabetes.
- Can be prevented by lifestyle changes. (Diabetes, 2021)

What are the symptoms of Diabetes?

- Peeing more frequently especially at night
 - Feeling more thirsty than usual
 - Weight loss despite increased appetite
 - Slow wound healing
 - Feeling tired
- (Diabetes UK, 2021)



Case Study

Some of the risk factors for Type 2 diabetes identified in Patient A include:

- Age - 45
- High blood pressure – 140/90
- Poor diet – Alcohol, foods high in fat and cholesterol
- Smoking – 1 to 9 cigarettes daily
- Inadequate physical activity – Once a month



Beneficial Lifestyle Changes

1. Healthy diet:

- Low carbohydrate and fat.
- Rich in fruits and vegetables. (5 a day)
- Cut down on fast food and consume more home cooked meals
- Portion control
- Low salt diet to control blood pressure

2. Increase physical activity:

- At least 30 minutes of walking, jogging or swimming daily
- Taking the stairs instead of elevator
- Walking instead of driving to run errands.



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SPEAKER NOTE

Introduction

Diabetes mellitus, known as diabetes as its short form, occurs when blood sugar or blood glucose gets too high in the blood. This is because the system that converts glucose to energy no longer functions properly. The food we eat builds up our blood glucose which gives us energy. If the body is unable to make enough insulin or does not make insulin at all, the glucose remains in the blood and does not get to the cells (Diabetes UK, 2021). The pancreas produces the hormone called insulin which helps the glucose from our food to get into our cells to be used for energy. It is when glucose stays in our blood and is unable to reach the cells that diabetes sets in.

Millions of people have diabetes, and many more people are at risk of type 2 diabetes. It is predicted that 5.5 million people will have diabetes in the UK by 2030 (Diabetes UK, 2020)

Type 1 diabetes: This is a condition where the immune system attacks and destroys the beta cells that produce insulin in the pancreas and leads to high blood sugar level. The incidence of type 1 diabetes has increased rapidly in the last quarter of a century leading to wider understanding of the disease. Type one diabetes affects about 400,000 people in the UK, 29,000 of this number are children. Type 1 diabetes accounts for 8% of the people living with diabetes in the UK, (NHS UK, 2021)

Type 2 Diabetes: This happens when the insulin being released by the pancreas is unable to work properly thereby leading to a rise in the blood sugar levels. This condition can be serious and can also be a lifelong illness. Type 2 diabetes accounts for 90% of diabetic cases in the UK (Diabetes UK, 2021)

Many people with type 2 diabetes can manage their blood glucose levels through a change in lifestyle and by taking medicine orally. Insulin could be administered where the medicines being taken do not effectively control the rising blood glucose level.

Effects of diabetes: If uncontrolled, over time, the high sugar levels can damage any or all the following:

- Damage to the macrovascular (large) and microvascular (small) blood vessels.

- **Kidney problems:** Diabetes can destroy the kidney by damaging the blood vessels in it. High glucose level can over time narrow the tiny blood vessels in the kidney therefore making them to clog.
- **Eye problems:** Effects of diabetes on the eye is mainly on the cornea and retina. About seventy percent of diabetics suffer corneal complications and it is called diabetic keratopathy. The other effect on the eye is diabetic retinopathy (DR) and it is the major cause of blindness in people above the age of 50. (Lutty, 2013)
- **Gums:** Uncontrolled blood glucose level damages the blood vessels in the gum which could make more vulnerable to getting infected. High amount of glucose in our blood can also create high amount of glucose in our saliva where bacteria find a good breeding ground. The acid produced by the bacteria attacks the enamel of the tooth and destroys the gum. (Diabetes UK, 2020)
- **Feet:** An elevation of blood glucose can damage the feeling in our feet. It also reduces the blood supply to the feet, which can make it difficult for cuts and sores to heal (Diabetes UK, 2020)
- **Nerves:** High blood glucose level can result in one's hands, legs arms and feet being destroyed. It is called diabetic neuropathy.
- **Heart:** The danger of having cardiovascular disease is much higher in patients with diabetes (type 2) than people without diabetes (Galstyan and Gilyarov, 2016)

Functions of the Pancreas

The pancreas is an organ in the abdomen and can be found behind the stomach and there are other organs surrounding it. Its role is very important in the body. Its head is found at the point where the stomach meets the first part of the small intestine. It has two major functions, they are, 1) It helps in digestion, which is known as exocrine function and secondly, and 2) It regulates blood sugar, known as endocrine function (El Sayed and Mukherjee, 2020).

Exocrine Function: The exocrine glands in the pancreas produce enzymes that aid the digestion of proteins, fats, and carbohydrates in the intestines. When food gets into the stomach, the pancreas releases fluid, known as the pancreatic juice into a system, this fluid is known as enzymes, and they end up in the pancreatic duct.

The pancreatic duct is joined by the common bile duct to form what is known as the ampulla Vater; it is found in a part of the small intestine called duodenum. The pancreatic juice and bile that gets into the duodenum, enables the body to digest food.

Endocrine Function: This part of the pancreas is made up of the islets. They create and release vital hormones into the bloodstream. The main hormones are insulin, and it helps to

decrease the concentration of glucose in blood. Maintaining proper blood sugar levels is very important as to how the main organs of the body function, i.e., brain, liver, and kidney function. It also allows glucose to enter our muscles and other tissues. When the sugar level in the blood is lowered, the body cells can use glucose for energy.

It is worthy of note that being diagnosed with diabetes does not translate to a death sentence. It has been proven with research that, a combination of lifestyle interventions, such as, diet, physical exercises and weight control can help in reducing the risk of type 2 diabetes by about 50% (Diabetes UK, 2020)

Pancreatic hormones

Hormones are in the pancreas are produced by many groups of cells. While enzymes are released into our digestive system, hormones are released into our blood, and they take messages to other areas of the digestive system. They include insulin, glucagon and gastrin amylin.

Insulin: The Pancreas makes the hormone called insulin; it is the insulin that acts on the glucose in our blood stream. It causes the cells in the body to absorb sugar which it converts into energy.

The blood glucose level is kept constant level by insulin. Whenever the glucose level in the blood stream is too high, the insulin in our system triggers the body to store the extra glucose in the liver. This stored glucose is kept until the glucose level goes down before being released before being released to replenish, this happens mainly in between meals or any time the body needs energy.

Insulin cannot be taken orally. It must be taken by injection, through an insulin pen, insulin pump or syringe. It can be injected in different parts of the body such as: buttocks, abdomen, thighs, upper arms

Glucagon: This helps to raise the blood sugar level when it gets too low, it sends a message to the liver to release sugar stored there. Glucagon is produced by the Alpha cells in the pancreas.

Gastrin and amylin: Gastrin helps to stimulate the gastric acid in the stomach. It is made in the G cell in the stomach, while some are made in the pancreas. Amylin helps the control of appetite and the emptying of the stomach.

PATIENT A

Patient A is a 45-year-old lady with a normal BMI of BMI:20.6Kg/m². She is however hypertensive with a blood pressure of 140/90, she has a family history of hyperlipidaemia, smokes 1-9 cigarettes a day over a fifteen-year period. She is not engaging in adequate physical activities, she only exercises once a month, which is inadequate, she is not maintaining a healthy diet, she eats so much of foods high in fats, cholesterol, and carbohydrates, and she drinks well above the recommended quantity of 14 unit of alcohol a week.

RECOMMENDATION:

I would like to recommend the following lifestyle change in patient A because she stands the risk of developing diabetes and its debilitating complications, such as cardiovascular diseases, such as stroke and heart attacks. These recommendations are also to ensure good control of her existing disease of hypertension and to prevent a possible progression.

1. **Stopping smoking:** Though not showing any modifiable risk factors, cigarette smoking can increase the risk of developing type 2 diabetes. The tendency of a smoker developing type 2 diabetes is between 30 to 40 percent more than a non smoker. It makes control of diabetes more complex because nicotine reduces the effectiveness of insulin in the regulation of blood sugar. It is referred to as insulin resistance (NHS, 2021) Cigarette smoking causes a narrowing of the vessels which supply blood and oxygen to the heart, brain, and other vital organs of the body.
2. **Diet:** A healthy diet regimen can help in preventing or controlling diabetes. Fried food and chocolates which are the main components of patient A's diet are rich in cholesterol, fat, and carbohydrate. High amounts of saturated fat can aid the onset of diabetes. There are good and bad cholesterol, these are HDL (good) and LDL (bad). Since Patient A already has a family history of high cholesterol (hyperlipidaemia), this puts her at further risk as the disorder could be genetic.

I recommend an increase in her consumption of healthy meals with low fat and high fibre, and rich in fruits and vegetables Patient A may also benefit from seeing a dietician to create a meal plan that suits her cultural, professional, personal, or religious standards as well as maintaining health and fitness standards. I also recommend a doctor's appointment to check his blood sugar levels as she may have type 2 diabetes as he may need medication in addition to lifestyle change.

3. **Physical activity (exercises):**
Patient A only exercises once a month. Regular exercises help in decreasing the risk of developing diabetes, cardiovascular disease, obesity, and cancer. She can indulge in physical activities such as walking, cycling, and climbing stairs instead of lifts and elevators.
4. **Alcohol:** NHS recommends a maximum of 14 units a week, spread across three or more days. Patient A drinks three to six units a day, this sums up to 21 to 42 units a week.

Alcohol increases the risk of developing diabetes, liver disease and cardiovascular disease.

I recommend that she cuts down on her consumption of alcohol and this may be understandably so.

Conclusion

From all available records the incidence of diabetes has been on the rise in the UK and across the globe. Since records have shown that 90% of diabetic cases in the UK are type 2 diabetes and about a million other people who are unaware, they have diabetes.

From my review of patient A, I can rightly advice every person based on my recommendations to patient A to have a healthy lifestyle by eating healthy which will involve eating foods with high fruits and vegetable contents, exercising regularly and abstaining from smoking and alcohol. They could also engage the services of dieticians to help plan and regulate their dietary habits. The fight against diabetes is a continuous battle that has no end at sight.

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LIFESTYLE QUESTIONNAIRE

Introduction: In order to help us focus our Health Promotion activities in the practice, we would be grateful if you could fill in this short questionnaire. If you have already completed one on a previous visit, please return this questionnaire to the receptionist.

Name : Patient A Date of Birth : 1st January 1976

Do you smoke? Yes ☒ [] No ☐ []

If Yes, do you – smoke less than 1 cigarette/day ☐ []

1- 9 cigarettes/day ☒ []

10-19 cigarettes/day ☐ []

20-39 cigarettes/day ☐ []

more than 40 cigarettes/day ☐ []

smoke a pipe ☐ []

smoke cigars ☐ []

If No, have you – never ever smoked ☐ []

given up smoking in the last year ☐ []

not smoked for more than 1 year ☐ []

Do you have high blood pressure? Yes ☒ [] No ☐ []

Have you ever had a heart attack or suffered from angina? Yes ☐ [] No ☒ []

Have you ever had a stroke, “shock” or any weakness down one side? Yes ☐ [] No ☒ []

Have any of the following – mother, father, brothers or sisters had – a heart attack below the age of 60 Yes ☐ [] No ☒ []

a heart attack above the age of 60 Yes ☐ [] No ☒ []

a stroke Yes ☐ [] No ☒ []

trouble with very high cholesterol Yes ☒ [] No ☐ [] (Her sister)

(hyperlipidaemia)

..... Practice Use Only

Health Education Smoking

BP: 140 / 90

Height 170

Weight 70

EXERCISE Healthy exercise usually involves activity that lasts for at least 20 minutes, raises your pulse and produces hard breathing. In younger people this might be running, cycling or sport, or brisk walking for older people.

Do you take this type of exercise – daily ☐

3 times weekly ☐

once weekly ☐

once monthly ☒

seldom ☐

I cannot take exercise because of disability ☐

DIET, Please tick the one category which is closest to your usual eating pattern.

I eat no meat, fish or dairy produce ☐

I eat no meat ☐

I eat a mixture including daily fruit and vegetables ☐

I eat a mixture including regular chips and fries ☒ (And sugary things like chocolate at nights)

I eat frozen meals (eg TV dinners) 3 or 4 times/week ☒

I eat mainly snacks ☐

I eat a special medical diet ☐ Please specify

.....

ALCOHOL

Please tick the statement which most closely describes your usual average alcohol intake.

(1 unit is 1 glass wine, ½ pint beer or a single measure of spirit.)

I never drink alcohol ☐

I drink less than 1 unit per day ☐

I drink between 1 and 2 units a day ☐

I drink between 3 and 6 units a day ☒ (Drinks 3 to 4 glasses of beer a day)

I drink between 7 and 9 units a day ☐

I drink more than 9 units a day on average ☐

- She has no disabilities.

Practice Use Only Health Education

Alcohol []

Alcohol Brief Intervention []