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Introduction to Physiology

(BMHP5003_LON)

Assessment Component 1

Poster Presentation

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The prevalence of diabetes in England has reached 4 million people [Diabetes U.K, 2019]. By 2030, the diagnosis in the UK is anticipated to be 5.5 million [Diabetes U.K, 2019].

DIABETES

THE SILENT KILLER



The prevalence of diabetes is high, the number of patients diagnosed is estimated at 422 million worldwide [WHO, 2020].

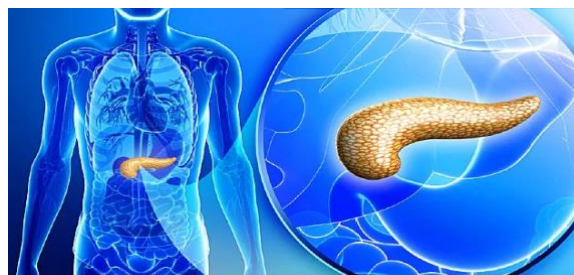


Figure 1. Shows the pancreas [WebMD, 2021].

What is Normal Physiology of the Pancreas?

After a meal blood glucose level rises above the healthy range which is called **hyperglycemia** [Gordon Betts et al., 2013]. Beta cells of the pancreas produce the hormone insulin that acts like a key to let the cells take in the glucose and use it as energy which results in decreased blood glucose level to an optimum value, returning the system to homeostasis [Peate & Nair, 2011]. If food is not consumed for a while, the blood glucose level is decreases below the healthy range which is called **hypoglycemia** [Gordon Betts et al., 2013]. Alpha cells of the pancreas release the hormone glucagon that increases blood glucose level, and the system is returned to the ideal condition [Peate & Nair, 2011].

Analysis of Health and Lifestyle Questionnaire.

The findings revealed a nonmodifiable factor which is age. The patient is 45 years old. In the late 40s blood sugar spike more rapidly and take longer to return to the normal range. The person suffers from hypertension also knows as high blood pressure (140/90 mmHg) and high cholesterol appeared in the family history (sister). It is identified that patient has an unhealthy diet. She is consuming sugary food, chips along with frozen, packed food a few times a week. Often eating carbohydrates is a potential risk because contain glucose that raises blood sugar levels. The patient does not include regular exercises in her daily routine. She is active only once a month. The factors mentioned above contributing to Patient A developing type 2 diabetes mellitus [Nesti et al., 2020]. The patient also smoking and drinking alcohol daily in a higher amount than should be.

What is Diabetes?

It is known as a chronic health condition that causes blood glucose concentration high for a long time after a meal [NHS U.K, 2021; NIDDK, 2021].

In DIABETES TYPE 1 the insulin is not produced, it is caused by an autoimmune reaction where the body attacks itself and destroys beta cells [NIDDK, 2021]. Patients have regular insulin injections to survive. Account for 8% of diagnoses, mainly affects children, teenagers, and young adults [Diabetes U.K, 2021].

In DIABETES TYPE 2 the pancreas does not make enough insulin, or the produced insulin is not used properly by the cells in the human body or cells stop responding to insulin, as a result too much glucose stays in the bloodstream [NIDDK, 2021]. Account for 90% of the total cases, mainly affect the population over 40 years included women and men [Diabetes U.K, 2021].

Common Symptoms include constant hunger, excessive urination, fatigue, slow healing of the wounds, excessive thirst, tingling in the hands [NIDDK, 2021]. **Complications of diabetes** lead to nerve diseases, kidney damage, stroke, blurry vision, blindness, heart attacks, infection [Diabetes U.K., 2019].

Prevention for type 2 mainly includes regular health checkups in a GP practice, control weight in the normal range, also limitations of stressors, salt consumptions, and any type of sugar intake, reduction of the blood pressure along with adopting exercise daily and healthy eating [NIDDK, 2021].



Figure 3. Shows the gangrene, the late stage of diabetes [NHS U.K, 2018].

Know the Risk Factors Contributing to Type 2 Diabetes.

The following are **modifiable** risk factors: lack of physical activities, unhealthy consumption of food such as junk and sugary food, hyperlipidemia, abnormal high BMI of the body, hypertension, alcohol intake, smoking [Nesti et al., 2020].

Risk factors that cannot be changed are called **non-modifiable** and in the case of diabetes type 2, there are as follow: race, ethnicity, the early 50s or late 40s, gestational diabetes in the family, and genetically inherited [Diabetes U.K., 2019].

Blood Glucose Chart			
Mg/DL	Fasting	After Eating	2-3 hours After Eating
Normal	80-100	170-200	120-140
Impaired Glucose	101-125	190-230	140-160
Diabetic	126 +	220-300	200 +

Figure 2. Shows indicator of blood glucose [Catalyst 4 Fitness, 2021].

Interventions to Avoid Disorder

Diabetes mellitus type 2 can be prevented through lifestyle modifications. A healthy balanced diet can really help, eating food, which is rich in whole grains, fruits, vegetables, including fish, egg, and white meat as a source of protein. Sugary food and products from the animals should be reduce to minimum. The patient A should ask GP to refer for a nutrition plan or dietician where actually can have diet balance in professional settings [Diabetes U.K, 2021; NHS U.K, 2021; NIDDK, 2021; Pan et al., 2018]. The patient needs to be mindful and keep active for at least 30 minutes a day, healthy exercises such as cycling, jogging, or tennis etc. must be implemented to daily routine because activity makes the cells become more sensitive to insulin, resulting in lower amount of glucose in bloodstream [Chetty et al., 2019; NIDDK, 2021].

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Speakers Notes

How are the nations affected by the silent killer that is diabetes? In the 21st century diabetes is a serious worldwide crisis and that's why it is necessary to be aware of the seriousness of statistics [WHO, 2020; Diabetes U.K, 2019].

The first figure taken from the WebMD website [2021] present the pancreas, which is a very important gland in human physiology, and the endocrine function takes place in the "islets of Langerhans" where each islet contains 4 different types of cells and each cell produces a different hormone [Tucker, 2015]. Normal pancreas physiology is associated with the regulation of blood glucose metabolism in the healthy range of 70-110 mg / dL involving two hormones known as glucagon and insulin [Gordon Betts et al., 2013].

The food that is consumed needs to be broken down into glucose and released into the circulation system [Tucker, 2015]. However, in diabetes, it is affected how the body turns food into energy because the pancreas does not make any insulin in type 1 or does not secrete enough insulin in type 2 and that's why the abnormal value of the sugar is accumulated in the bloodstream [Gordon Betts et al., 2013].

The differences and similarities between type 1 and type 2 diabetes are presented in the poster to make patient A aware of what a serious and progressive conditions diabetes is and what its final stage may look like in the human body. Furthermore, risk factors for type 2 were highlighted to encourage the person being interviewed to implement a preventive plan before the symptoms are recognized by the health professionals. The second figure taken from the Catalyst 4 fitness [2021] presents the blood glucose index for normal range, pre-diabetes, and finally for diabetics to be aware of what is normal and abnormal blood sugar value.

In-depth analysis of the Lifestyle questionnaire completed on patient A revealed many modifiable factors of type 2 diabetes that put the diagnosed person at high risk of developing chronic diabetes. Only two interventions have been proposed for the purpose of this assessment. Numerous scientific studies have confirmed that a healthy life without type 2 diabetes is associated with a high impact of physical activity and a balanced diet in a person's life. Superfoods to help control diabetes are presented in the form of pictures

on the poster. Lifestyle suggestions for patient A are likely to be affordable, safe, effective, and well-tolerated by most diagnosed diabetic patients [NIDDK, 2021].

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