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ASSESSMENT 2

INTRODUCTION TO PHYSIOLOGY

BMHP 5003

AUGUST, 2021.

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INTRODUCTION

This report is to establish the function of the body in blood glucose level regulation and to highlight causative factors of diabetes as well as present recommendation for managing diabetes in general. This will be accomplished by taking cognisance of Patient A through different analysis of lifestyle and habits as well as a probe into medical history.

CASE STUDY

The case study in this report is a 45 years old female Patient A with details as follows: Height of 5.2ft, 160cm, weight of 80kg, 176lb, BP of 140/90mmHg, with family history of high cholesterol level. She also has a steady consumption of 20 to 39 cigarettes daily, 2 glasses of alcohol, excessive junks and chocolates, chips and fries without any form of exercise.

PATHOPHYSIOLOGY OF DIABETES

In order to properly understand diabetes, it is important to first understand the physiological process that occurs during and after every meal. According to Godoy-Matos, A. F. (2014). In the human system, food goes through the digestive system, where fat and oil, carbohydrates and other nutrients in the food is being absorbed in the systems bloodstream. The presence or intake of sugar or carbohydrate sends a signal to the endocrine pancreas to release hormone insulin. In the body, insulin causes the conversion and storage of sugar by majority of the tissues in the body, particularly the fat tissues, the liver and the musculature.

According to Micheal J. Vieira L (2004), Pancreas happens to be one of the most important organ in the body, and it acts as a digestive system and as an endocrine organ in the body. The digestive enzyme secreted by the exocrine pancreas are 99% and are picked up and circulated by ducts in the pancreatic acini, and then emptied into the small intestine. The 1% is thereby picked up and circulated by clusters of the cells termed as pancreatic islets, which makes up a huge percentage of the endocrine pancreas. The pancreatic islets helps in secreting hormones. These pancreatic islets is made up of four cells which are δ – cells, α -cells, F-cells, and β – cells. Each of these cells generate exclusive hormones, delta cells produce somatostatin or growth hormone- inhibiting hormone (GH-IH), alpha cells produce glucagon, F cells releases pancreatic polypeptide and alpha cells produce glucagon. Pancreatic polypeptide orders and

regulates the secretion of enzymes in the digestive system and it also inhibits gall bladder contraction, GH-IH helps to slow the absorption and secretion process from the GI tract and it also inhibits the secretion of both the glucagon and insulin, typically in reaction to food with high protein value.

According to Matthew H, (2020) Normal blood sugar level is usually within the range of 70-120 mg/dl. Maintaining blood glucose on this strict values/range will always require negative response. This slim line between the high value and of blood glucose reference range is naturally maintained by insulin and glucagon in most cases, there is an expectation of a rise in blood sugar level immediately after a meal, insulin comes in immediately to stabilize the level and does this through pathways signaling. There are two pathways signaled in this case and the first has to do with more glucose absorption by the cell and then activation of glycolytic pathway, after this the final pathway which is conversion to fat of the excess blood sugar. Röder, P et al (2016). On the contrary, according to Godoy-Matos, (2014), glucagon steps in to action when the sugar level in the body falls, it stimulates the gluconeogenesis pathway which breaks down reserved sugar (glycogen) to glucose.

TYPES OF DIABETES

According to Tayde, P (2019) there are two outstanding forms of diabetes and they include type1 and type 2 diabetes. Diabetes can occur during pregnancy and other condition such as genetic disorders, insulin receptor issues, chemical toxicity in the body, as well as endocrinopathies, insulin receptor disorders and accompanied by pancreatic external secretory gland dysfunction.

Diabetes Type 1

This ailment arises due to outcome of complications of different illnesses in which environmental and genetic conditions gives rise to an autoimmune reaction that needs to be fully explained, Davies, J.L. (1994). During the occurrence of diabetes type 1, the pancreatic Beta-cells which are in the Langerhans' islet are damaged, giving rise to individuals with this condition and with total dependency on external administration of insulin to life a seemingly normal life, Keenan, H.A. et al (2010). Generally the onset of this disease begins before 30 years of age. Despite the fact that diabetes type-1 is an insulin-inadequate situation, characteristic insulin-resistance are becoming more frequent because of increased obesity rate amongst the western populace. In

addition to this, the resistance to insulin may be worsen by high intake of external insulin intake (which is taken intravenously) by these patients, Josephine M, Mark E (2013).

Type 2 Diabetes

According to Josephine M, Mark E (2013) Diabetes Type 2 (the most prevalent type of diabetes) can be observed in about 85% of the population. In this type of disease, the tissues that obviously shows decreased insulin sensitivity are the adipose tissues, liver and skeletal muscles because of the specific necessity for glucose metabolism as well as uptake at these positions. The upsurge frequency of diabetes type two, mostly in growing economics, accompanies urbanization trends and changes in a persons' lifestyle and activities. Most significantly, "Western-style" feeding habit is related to obesity. All these points to the fact that this particular autoimmune disease is greatly influenced by environmental elements. It is very doubtful that aging or genetic factors alone could pull the occurrence of this disease, on the contrary, it has been established that increase dietary fat intake, high calories consumption, sedentary lifestyle, and increased body mass will ultimately lead to Diabetes type 2.

LIFESTYLE NOTIFICATION

From the questionnaire and information obtained from the case study in this report, Patient A indicated to be well above the age of 40, is obese with BMI of 31.25 , has no record of daily exercise (sedentary lifestyle), she has established high blood pressure and has known family history of high cholesterol level and stroke, she also smokes about 20 to 39 cigarettes per day, and consumes lot of alcohol, junks and chocolates.

According to Bhaskar, (2012). Junk are low in nutritional content but well packed with extremely adverse calories value, therefore, consumption of too many fats and sugar which are found in junk foods/snacks will birth excessive weight gain which is harmful and can in turn lead to diabetes. So is the case of Patient A as she consumes a large amount of these foods. Chocolates and other fat rich junks are non-nutritional food and pose very high level of health threat and damage. Junks here includes already-processed food packs like processed foods, snack foods, and fast foods. All these and more can has left Patient A at high risk of the

development of diabetes since sugar levels will be increased in the blood, triglyceride levels will be elevated, and weight gained. Asif, M. (2014).

Moreover, Patient A has high BMI of 31.25 which is considered as obese value, entail increase in body mass and can be associated with elevation of occurrences of diseases like diabetes mellitus, dyslipidaemia, and hypertension. Bay, Grandy, Chapman, (2007, pp. 737–747). BMI also known as Body Mass Index is precisely associated with diabetes and insulin resistance in obese persons. Patient A BMI was estimated as her how much she weighs in Kg divided by the square her measured height (tallness) in meters. In people with high body mass index, substances responsible for the development of insulin resistance are elevated, these substances include: proinflammatory substances, cytokines, glycerol, NEFA, and hormones. Insulin resistance accompanied by impairment of Beta-cell function precedes the progress of diabetes, this is further explained in Figure 1 in the Appendix section. Weight gain at an early age is undoubtedly associated with the occurrences of diabetes type-1 Abdullah, S. et al (2014).

Furthermore, Patient A is given to a constant habit of consuming 20 to 39 cigarettes per day which is a risk factor of diabetes as it is not hidden that cigarettes increases one's exposure to cancer, disorders in body parts like lungs, kidney and heart but a majority of the worldwide population are not fully aware of the fact that smoking is a confirmed risk factor of diabetes type 2. In addition, according to Pan et al (2015), steady cigarette intake is one of the most topmost rated risk factor for diabetes mellitus and there has been several establishments that smoking noticeably upraise experience to micro and macro vascular disorders in type 2 diabetic patients. Conclusively, researches have undoubtedly established that intense consumption of alcohol is a permanent pointer for various chronic ailments, with Type-2 diabetes and its impairments inclusive, Volaco, (2018).

RECOMMENDATION AND CONCLUSION

From the accessed case study it is established that Patient A is mostly affected by Diabetes mellitus (diabetes type-2). Controlling blood sugar is main aim for treatment of both Diabetes type-1 as well as type-2 and treatment of diabetes type-1 implies: insulin use, exercise, and type 1 regulatory food menu. On the other hand, treatment of diabetes type 2 will involve reduction in

weight, active lifestyle, and type 2 regulator diet- diabetes drugs are prescribed and if for any case, the drugs becomes ineffective, insulin will be immediately used as a treatment.

As a social worker, it is recommended that Patient A sees a doctor who might prescribe and administer drugs if appropriate in order to get an healthy lifestyle and gain back health, she should also keep a close eye on blood sugar level by daily monitoring with any device recommended by the doctor. Furthermore, I recommend that Patient A works towards losing reasonable amount of weight by avoiding sedentary lifestyles, junks consumption and excess alcohol intake and should practice daily simple exercise in order to run smooth health, she can also employ the NHS lose-weight formula which entails not skipping breakfast, eating regular meals, eat mostly vegetables and fruits, getting more involved in activities that requires movement, consume lots of water, eating food with high fiber content, reading food labels to avoid ignorantly taking some harmful ingredients, using smaller plates, avoiding junks stock up, cutting down on alcohol or stopping totally, and planning meals.

Patient A should also research on, build knowledge, and get pamphlets and magazines speaking about healthy dieting habits in order to ascertain the exact food to eat and those to avoid- she can maintain a diet with more fruits and vegetables rather than carbohydrates and junks. She should practice drinking water mostly at night in order to clear off toxins. Since most valid results in diabetic control is owed to lifestyle and environmental changes, this should be cultivated. Lastly, Patient A should keep up with all doctor's appointments and checkup and hold up a mindset to change habits in order to get a hold on her health.

Patient A should quit smoking, either by consciously making a plan to and using family members or friends to monitor her progress until he get to her fixed day and attitude. If the smoking had become an habit over time, she could sort the help of counselors to help her through the process.

From this report I have been able ascertain the risks factors of diabetes thereby being able to figure out lifestyles I should avoid and would love to recommend anyone to avoid, I have also for the first time done a clear research on BMI and known that obesity is not only dependent on weight. I can now tell the differences between type 1 and 2 diabetes and have established how my system works to balance my sugar intake and blood sugar level in general.

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APPENDIX

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

Date of Birth

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 []

(hyperlipidaemia)

.....

Practice Use Only

Health Education Smoking

BP /

Height

Weight

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 ☐

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, 1/2 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 []

I drink between 7 and 9 units a day []

I drink more than 9 units a day on average []

.....

Practice Use Only

Health Education Alcohol []

Alcohol Brief Intervention []

Images

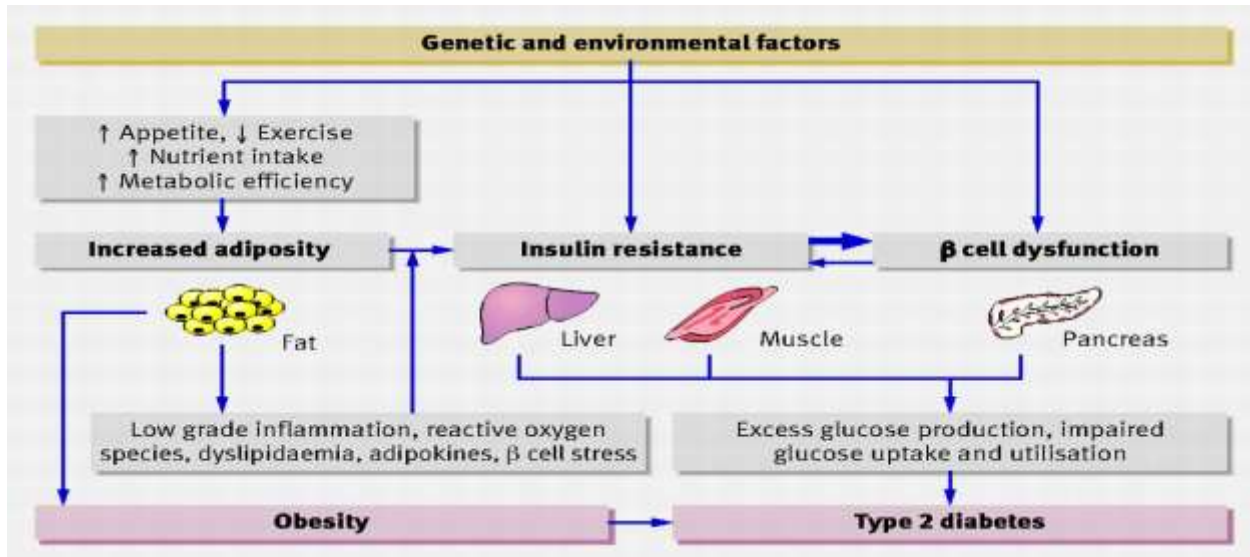


Figure 1: <https://doi.org/10.1136/bmj.d1996>