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COURSE
B.SC HEALTH AND SOCIAL CARE LEVEL 5

MODULE
INTRODUCTION TO PHYSIOLOGY

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ASSIGNMENT TITLE 1
POSTER PRESENTATION

DIABETES

INTRODUCTION

463 million worldwide aged (20-79 years) have the condition. (IDF Diabetes Atlas 2019)

DIABETES

Diabetes is high amount of glucose in blood stream and other disruption of fat, carbohydrate and protein metabolism .(Abebe and Balch, 2012).

TYPES OF DIABETES

There are two types of diabetes, type1 diabetes and type2 diabetes.

Type 1 diabetes occurs due to the destruction of the pancreatic beta cells by the T cells(Graham.etal.,2012)

Type 2 diabetes occurs due to the inability of the body tissues such as liver , muscles to respond to insulin.(Cantley and Ashcroft, 2015).



PHYSIOLOGY OF DIABETES

Connected to the ability of the body to utilize insulin and the amounts of insulin in the body.

Type 1 this happens when autoimmune destruction of beta cells that produces insulin ,insulin is absent. and patient requires insulin injection

Type 2 when patient have tissues that does not respond to insulin ,pancreas stops producing insulin, making the amount of insulin to drop or decrease.

CASE STUDY AND FINDINGS FROM PATIENT A

Patient a is at risk of developing type 2 diabetes.(Marinho,Vasconcelos,Alencar,Almeida. and Damasceno,2013)

Patient A has a high blood pressure

Patient A smokes a lot of cigarettes

Patient A drinks a lot of alcohol

Lack of exercise

INTERVENTIONS AND MANAGEMENT.

Low calorie diet, vegetables oil, Avocado, fibre such as fruits grains .(Ajala.et.al.,2010) improves treatment for diabetes

Eating grains with a dietary intake of 14g/100kcal and reducing alcohol consumption improves treatment of type 2 diabetes(Evert.et.al.,2014)

Aerobic exercise training enhances VO2max cardiac output
(Sluik et al., 2012)

EXERCISE – The use of resistant training exercise to manage the treatment of type 2 diabetes.(Dunstan,et.al.,2002)

INTRODUCTION

Diabetes is a lifelong disease that poses a public health challenges.(Ramal et al.,2012).The prevalence of diabetes incidences are on a rapid increase 374 million are at a risk of developing type 2 diabetes, over 20 million live births are affected by diabetes during pregnancy, more than 1.1 million children and adolescents are living with type 1 diabetes, diabetes caused around **USD 760 billion dollars** in health expenses in 2019, roughly 463 million adults (20 -79 years) were living with diabetes by 2045 the figure will increase to 700 million. (IDF Diabetes Atlas 2019). Across the U.K there are roughly 3.9 million people who the condition.(Diabetes U.K 2019)

DEFINITION OF DIABETES

Diabetes is high amount of glucose in the blood stream and other disruption of fat, carbohydrate and protein metabolism.(Abebe and Balch, 2012).Diabetes also is a chronic disease that causes, blood sugar level to rise.(NHS, 2019). It is also a lifelong condition that results from the inability of the body to transport glucose from fat ,muscles and liver into the cells in the body for energy consumption.(National Institute of Health 2014). Numerous complications are linked to diabetes including microvascular diseases such as neuropathy ,retinopathy and macrovascular diseases such as coronary artery diseases, stroke and infections.(Gregg et.al.,2014).

PHYSIOLOGY OF DIABETES

The pancreas secretes insulin and glucagon into the blood stream to regulate the amount of glucose in the body . Insulin lowers blood sugar levels in the body by allowing glucose to enter body cells . The pancreas secretes glucagon when the blood sugar level is lower. After food glucose and amino acid is absorbed directly into the blood stream making blood

glucose level to rise , due to this rise beta cells secrete insulin to lower the blood sugar. Insulin enhances glucose to enter cells such as liver , muscles ,adipose tissues which are converted into energy.

TYPE 1 DIABETES

Type 1 diabetes is mostly common in children and young people, they make up to 10% of all diabetes cases. Type 1 diabetes is the inability of the pancreas to produce sufficient insulin , due to autoimmune destruction of the beta cells by the T cells.(Graham et. al.,2012). (pdf)The attributes of type 1 diabetes is the existence of autoantibodies against the pancreatic islets cells. The autoantibodies include glutamic acid, zinc transporter protein, protein tyrosine phosphate, Islet cell autoantibodies, autoantibodies to insulin , they are the attributes of type 1 diabetes. It is also associated with the absence of insulin secretion. Genetic and environmental factors are linked to the causes of type 1 diabetes. The symptoms of type 1 diabetes include blurred vision, weight loss, tiredness, polydipsia.

TYPE 2 DIABETES

Type 2 diabetes is mostly seen in older adult ,type 2 diabetes makes up about 90% of all diabetes cases. It is caused by genetic and environmental factors.(Murea, Ma, and Freedman , 2012). Type 2 diabetes is the inability of the body tissues such as the liver, muscles, adipose tissues to respond to insulin, thus insulin resistant , accompanied with insulin deficiency mainly due to secretory defects with insulin resistance.(Cantley and Ashcroft, 2015).

CASE STUDY OF PATIENT A

Patient A is 48 years old, with a height of 1.70 m and a weight of 70kg. Patient A drinks about 3-6 units of alcohol a day, patient A blood pressure is 140/90mmHg and Patient A eats a lot of frozen meal, red meat as well as a lot of cheap and sugary foods. Patient A exercises once a month and smokes between 1-9 sticks of cigarette a day. Patient A has never had a heart attack before and no disability. Patient A does have a family history where any one has had heart attack, stroke or sister or brother that has had a high cholesterol.

FINDINGS FROM CASE STUDY OF PATIENT A.

Findings from the case study reveals that patient A has a high blood pressure, has a poor diet, Age, drinks lots of alcohol, inactivity or lack of exercise smokes lots of cigarette a day. Findings reveals that patient A has the risk factors of developing Type 2 diabetes. Patient A dietary and behavioural lifestyle will increase the risk factors of developing type 2 diabetes, which include age, obesity, high blood pressure, physical inactivity and family history. (Marinho, Vasconcelos, Alencar, Almeida and Damasceno, 2013).

Patient A smokes 1-9 cigarettes a day, many studies have shown that smoking increases the risk of developing type 2 diabetes and aggravates the micro and macro vascular complications. Smoking increases the risk of type 2 diabetes by 30 - 40% compared to non-smokers. (Surgeon General Report 2014). According to Cho. et.al., (2009). Smoking increases the risk of developing type 2 diabetes. Smoking also increases insulin resistance in patients with type 2 diabetes. (Attvall S. et.al., 1993). Various studies have revealed that smoking enhances diabetic neuropathy, as well as a risk factor for diabetic kidney diseases and HbA1c levels.

Patient A exercise once a month, which is very poor, studies have shown that adults that maintain regular physical active lifestyle can reduce the risk of developing impaired glucose tolerance, insulin resistance and type 2 diabetes. Increased

haemoglobin A1c (HbA1c) are predictive of vascular complications in patients with diabetes and frequent exercise reduces HbA1c.

INTERVENTIONS AND MANAGEMENT.

Physical activities or exercise and diet are the most components of the management and treatment techniques for patients with type2 diabetes

HEALTHY DIET(NUTRITION)

Healthy diet is an essential part of diabetes management. The type of food we eat affects blood glucose level differently. People with diabetes need a diet with low number of calories if they are overweight ,substituting saturated fats such as butter, cream with unsaturated fats such as vegetable oils, avocado, and eating dietary fibre such as fruits and grains and vegetables. According to (Ajala et al.,2013), researchers discovered that dietary actions such as low carbohydrate diet high protein diets ,Mediterranean are helpful in improving the treatment of type 2 diabetes. People with type 2 diabetes that are nonobese are encouraged to consume calories consistent with their optimal weight and personal activities.(Evert et al.,2014)

Personalized dietary plans for controlling and prevention type 2 diabetes should involve reduction in carbohydrate and fat intake, these measures can be achieved by carbohydrate counting or glycemic index can be used to control the intake of carbohydrate. Saturated fat intake of less than 7% of total calories and reduction of trans fat intake. Eating foods that contain whole grains with the aim of accomplishing a dietary intake of 14g/100 kcal and reducing alcohol consumption to one drink per day.(Evert et al.,2014)Source go to desk top pdf, definition

AEROBIC EXERCISE

Aerobic exercise are sort of cardiovascular conditioning , they comprise activities such as cycling, running, walking swimming. This exercises has to with our breathing .Aerobic exercises help in the management and treatment of type 2 diabetes. Aerobic exercises comprise of frequent rhythmic movement of huge muscle groups such as cycling ,walking , jogging. Adults that maintain regular physical active lifestyles can reduce the risk of developing impaired glucose tolerance ,insulin resistance and type 2 diabetes.(Zanuso S. et. al., 2010). Increased Hamoglobin Alc (HbAlc) are predictive of vascular complications in patients with diabetes, and frequent exercises has revealed that exercises reduces HbAlc.(Baule et. al.2003). current American Diabetes Association guidelines states that singular individual period of aerobic activity should last at least 30 minutes per day and be carried out 3 to7 days of the week. Aerobic exercises training enhances Vo2max cardiac output which are related with reduction of vascular and mortality risk in patient with type 2 diabetes .(Sluik et. al.,2012). . Aerobic activities have an effect on weight loss and improved regulation of lipid and lipoprotein metabolism . Aerobic exercise training of 60 adults with type 2 diabetes that lasted for 6 months in a report in 2007 shows a reduction in HbA1c, fasting plasma glucose, insulin resistance and systolic blood pressure .

RESISTANCE EXERCISE

Resistance training are associated with movement using elastic resistance bands., body weight exercise, weight making . Studies have shown that resistant exercises in type 2 diabetes enhanced from 10-15% in muscle mass, insulin sensitivity , cardiovascular health , blood pressure , lipid profiles and strength. . In another report carried out studies shows a three-fold greater reduction in HbAlc in patients with type 2 diabetes ages from 60-80 compared with non-exercising patient in control group. Report shows an increase in lean body mass in the resistance training group , whereas those in the non-

excising control group lost lean mass after 6 months .(Dunstan, et.al.,2002).These findings agrees to the use of resistance training in diabetes management plan.

COMBINED AEROBIC AND RESISTANCE TRAINING.

Combined training program could improve insulin sensitivity beyond that of aerobic exercise alone ,in 28 postmenopausal women with type 2 diabetes . After 16 weeks of combined training to substantial increase in insulin mediated glucose uptake compared with a group performing only aerobic exercise, revealing greater insulin sensitivity.

CONCLUSIONS

The prevalence incidence of diabetes is rising at an alarming rate, the rise on the incidences of diabetes has made it to be a global health crisis, that requires health urgent attention. The risk factors associated with the development of diabetes and recommendations on prevention and management of diabetes , requires modification on our dietary and behavioural lifestyles . Healthy diet and regular exercise have been suggested.

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