

DIABETES

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INTRODUCTION TO PHYSIOLOGY

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Introduction

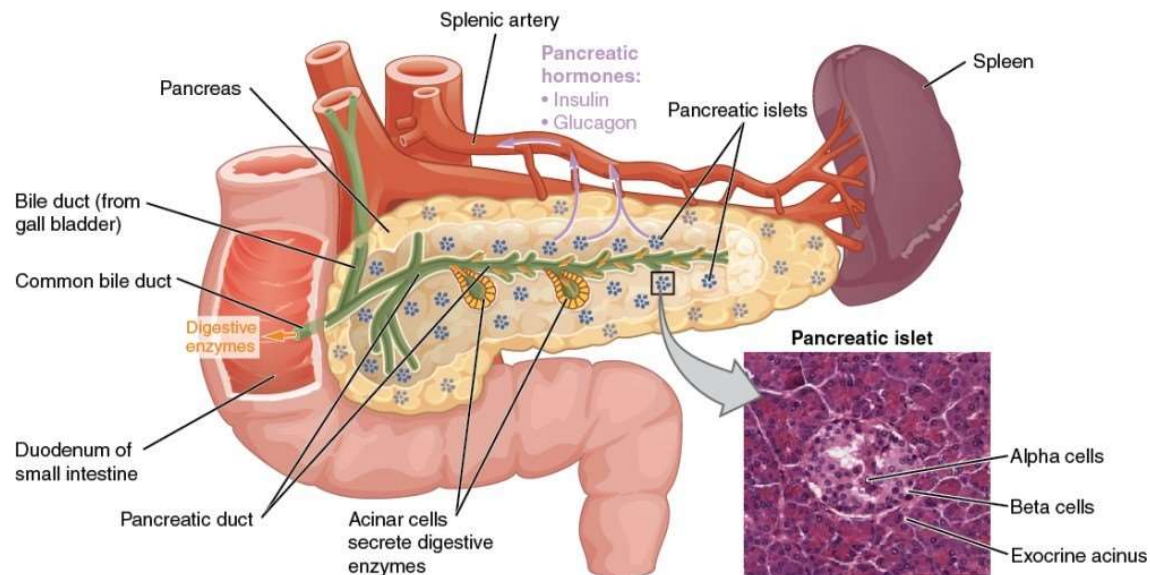
Diabetes mellitus is a metabolic disease, involving, an inappropriately high level of blood glucose. In simple terms, diabetes is a disease you get when your blood sugar or glucose is too high. However, we need blood sugar because it is the main source of energy from the food we eat.

The disease is a disorder of insufficient control of blood sugar. It has many subclassifications, along with types 1 and 2. Type one and two diabetes mellitus are the predominant subtypes, each with different pathophysiology. (Amit and Priyanka, 2021)

In this report, I will be writing about the anatomy, health, and lifestyle routine measures, and how to live with this disease.

We know having diabetes can be stressful, but that should not hold you back from living life. That is why adopting a healthy lifestyle that encourages mental and physical fitness. A healthy lifestyle is important for treating or preventing diabetes. (Ellen et al, 2008)

Anatomy and Physiology of Diabetes.



(Lumen, n.d)

We need to know the body parts involved to understand what diabetes really is. What really happens when a patient is diagnosed with diabetes?

Anatomy

The Pancreas: This is a long and leaf like shaped organ located in the bottom half of the stomach (abdomen). The length is about 6 inches. The pancreas head is located on the right side of the abdomen, and it is connected to the first section of the small intestine through a small tube called the pancreatic duct and the tail extends to the left side of the body. It plays an important in digestion by producing enzymes that help break down the food we eat. It also plays a vital function in the digestive system. (Mathew, 2021)

Each of the pancreatic islets contains four varieties of cells:

The Alpha Cell makes up about 20 percent of each islet and produces the hormone glucagon. Glucagon plays a vital role in blood glucose regulation.

Beta Cell is about 75 percent of each islet and produces the hormone insulin. Higher blood glucose levels stimulate the release of insulin.

Delta Cell secretes the peptide hormone somatostatin and accounts for 4 percent of islet cells. Pancreatic somatostatin inhibits the release of both insulin and glucagon.

PP Cell secretes the pancreatic polypeptide hormone and accounts for approximately 1 percent of islet cells.

Physiology

Diabetes takes place when there is a dis-balance between the demand and the production of the hormone insulin. Pathophysiology of type 1 diabetes is that in this scenario the immune system assaults and destroys the insulin-producing beta cells of the pancreas. There is a beta cellular deficiency predominant to total insulin deficiency. Whereas in diabetes type 2 there is a relative deficiency of insulin and no longer an absolute deficiency. This means that the body is unable to produce enough insulin to meet the needs.

Glucagon – during fasting, period, exercise, or pro-long labour, the receptors in the pancreas can sense the reduction of blood sugar levels. Glucagon is a hormone produced in the cell of the pancreatic islets. Encoded by the proglucagon gene the neuroendocrine convertase-2 processes the proglucagon peptide to produce the 29-amino acid native glucagon peptide. (Kirk et al, 2010)

Insulin – This is a hormone created by the pancreas that allows cells to absorb glucose, and sugar from the blood. The pancreas is an organ behind the belly that is the most important source of insulin in the body. Clusters of cells in the pancreas known as islets produce the hormone and determine the quantity based totally on blood glucose levels in the blood.

Insulin also helps in breaking down fat or protein for energy. Refined balance insulin regulates blood sugar and many processes in the body. If insulin levels are too low or high, excessive, or low blood sugar can start to cause symptoms. Serious health might start to develop if a state of high or low blood sugar continues. (Adam, 2018)

Health and Lifestyle Routine Measures

If you follow the below six changes in your lifestyle, you can manage your diabetes.

Healthy diet - If you have diabetes, it is very important that you look after what you eat. Because what you eat can affect your blood sugar levels. Ensure that you eat non-fat dairy and lean meat. Eat plenty of fruits, vegetables, and whole grains. Try to avoid too much carbohydrate food.

Physical exercise – With diabetes, you need to be active and do a lot of exercises. You may join a gym if you can, or can-do simple exercises like running, walking, riding a bike, climbing stairs, fasting, swimming, and doing strenuous stuff like cleaning your home or gardening. You exercise for at least 30 minutes to make you breathe faster or sweat. An active lifestyle can help decrease glucose levels and reduces the risk of heart disease. Regular physical exercise can help you stay active. You should be doing at least two and half hours of exercise a week. climbing stairs, fasting, swimming, and doing strenuous stuff like cleaning your home or gardening.

Stop Smoking – If you have diabetes and smoking it increases the risk of stroke, heart disease, vessel disease, kidney disease, eye disease, nerve damage, and foot problems. If you smoke, it makes it harder for you to exercise. So, avoiding smoking altogether comes with useful health benefits and can help you live better with diabetes.

Reduce or stop alcohol – Alcohol like beer, wine, or liquor to control your blood sugar. Do not overdrink if you choose to continue drinking (one a day for ladies, and not more than two for men). Excessive alcohol is not only bad for people with diabetes but also bad for everyone because it increases blood sugar levels.

Manage your stress – Stress can increase your blood sugar levels. You may not be able to manage your diabetes well when you are anxious. For example, you may forget to exercise. Stress stimulates the release of various hormones, which can crease blood sugar levels. (Richard et al, 1992)

Do check-ups – Ensure you see your doctor at least twice a year to check cholesterol levels, blood pressure, and eye examination, and your foot should be checked for foot ulcers and nerve damage. (Mary, 2021)

Health and Social Care Practice

There are over 4.7 million people with the condition in the UK and it is expected to increase substantially by 2030. Diabetes is a major condition and a growing source of admission in the National Health Service.

Unlike other diseases, diabetes requires continuous attention and care. It is very important that care workers and the community are involved in integrated diabetes care. To improve the care of diabetic patients in care homes, the following guideline should be followed:

1. There should be a person's centered diabetes care plan, where diabetic residents are cared for based on their individual circumstances or condition
2. CQC should develop a policy of diabetes care in the UK, encouraging every care home to follow the required guidelines to improve quality and support for their patients
3. Screening for diabetes during admission and every two years within care homes should be embedded in the policy.
4. Ensure the development of an audit tool to be able to assess the quality provided for diabetes care are up to standard.
5. There should be a template that can be used or adapted to oversee the initiation of insulin in care homes and community settings.
6. One diabetes specialist should be appointed for older adults in each district to ensure requirements are met for residents in care homes.
7. Care home staff should be given the opportunity to attend a diabetes training or educational program within each district.

An individual care plan is expected to be put in place for each resident to ensure that care for older people is tailored according to their needs. Care plans are very important for people with diabetes. There should be an agreement between patients, family members, carers, general practitioners, and care home staff about the individual care plan. To also ensure that all necessary information about the patient will be available when they go to the hospital or clinic for admission. This will guarantee the fear of poor communication issues. These care plans should take into consideration the different conditions that an older person may have, for example, in the case of those with diabetes, their nutritional, retinopathy podiatry, and medication needs.

Normally, there should be an individual care plan for all residents. But research shows that 11 percent of care homes did not have a care plan in place, and some residents are not getting the care support they need. There is a significant number of people with diabetes in a nursing home who have not been diagnosed which is why existing care plans for people in nursing homes are not tailored or fit for purpose. In order for people's care plans to meet their needs, residents should be screened at regular intervals and at admission, this would ensure residents' care plans reflect their needs.

Diabetes Training in Care Homes

The quality of diabetes training for care staff can significantly improve the level of care residents receive. There should be both internal and external training for staff, for example, use of television and online sources, getting information from third parties such as pharmaceutical companies, and completion of internal handbooks. (Diabetes UK, 2010)

Recommendation

You will be advised to keep your HbA1c values below 6.5%. Setting your target for daily activities is very important to avoid complications and the risk presented by hypoglycaemia.

The lower the HbA1c value you can achieve without increasing instances or severity of hypoglycaemia, the better.

Blood pressure targets for type 1 diabetes should be below 135/85 mmHg and blood pressure targets for type 2 diabetes, should be below 140/80 mmHg or 130/80 mmHg if the person has kidney disease, cerebrovascular disease, retinopathy, or stroke.

If you have diabetes with complications such as retinopathy and nephropathy, the target level is lower than people without diabetes.

Ensuring that cholesterol levels are measured each year to assess the long-term diabetes complications or risk of heart disease. A risk assessment should be done on people with type two diabetes for stroke or heart disease.

Charity Diabetes UK has set out the following list of blood lipid or cholesterol targets as a guide for people with the condition:

Cholesterol – Should be under 4.0 mmol/l. Cholesterol is not a bad substance in your body but too much of it can negatively impact your health. (Camille, 2021)

LDL levels – Should be 2.0 mmol/l

High Density-Lipoprotein – at least 1.0 mmol/l for men and 1.2 mmol/l for women

Triglyceride levels – less than or equal to 1.7 mmol/l

Kidney – A study shows that 40 percent of patients who are diabetic can develop kidney disease. Kidney guidelines for people with diabetes are as follows: (Radica et al, 2017)

Albumin/ creatinine ratio should be less than or equal to 2.5 mg/mmol for men and 3.5 mg/mmol for women. (Diabetes UK, 2019)

Your weight: ensure that your body weight is controlled because reducing your weight can help decrease your blood sugar level as well. (NHS, 2020)

All overweight patients should be encouraged by their physicians to lose weight because it has a significant impact when choosing the right therapies or reducing blood sugar. Weight loss can decrease or delay the risk of T2DM and has been proven to improve glycaemic control. (John, 2014)

Conclusion

Diabetes is a serious disease that is life-threatening, it should be constantly monitored and effectively subdued with the right medical attention and ensure that you adapt to the required lifestyle. If you eat healthy diets like fruit and vegetables, do regular exercise, and ensure your blood sugar level stays balanced by doing a regular blood test, you are guaranteed of long life. (NHS, 2019)

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