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What is Diabetes?

- Diabetes is a chronic illness that affects the immune system of the human body where the body glucose level is affected most (Goldstein and Mueller-Wieland, 2018).
- Due to diabetes, the pancreas of the human body is affected that either stop producing insulin or produce insufficient insulin to control blood glucose level. As a result, when the glucose level increases the body starts to respond negatively including damage to body organs, fatigue, and long-term impact on the body. Based on the characteristics of diabetes, there are two types of diabetes commonly diagnosed in the human body- type 1 diabetes and type 2

- Type 1 diabetes is caused due to an autoimmune reaction when the body starts to treat itself as a treat and attacks it by mistake and as a result, the body stops producing insulin.
- Insulin is produced by the pancreas wherein types 1 diabetes the pancreas stop functioning where the patient with type 1 diabetes needs to intake insulin on regular basis.
- Type 1 diabetes is a genetically carried disease where children, adolescents, and young adults are diagnosed with this type of diabetes where the prevalence rate is 5-10% among the total diabetes patients (Taylor and Olefsky, 2020).



- Type 2 diabetes is caused when the pancreas of the human body starts dysfunctioning where a sufficient level of insulin is not produced or on the other hand, increased insulin is produced that makes it difficult to control blood sugar level.
- Type 2 diabetes is caused due to unhealthy lifestyle, obesity, and genetic factors where people aged 30 years and above are usually diagnosed with this type of diabetes where the prevalence rate in 90-95% among all types of diabetes (Goldstein and Mueller-Wieland, 2018).
- Patients with type 2 diabetes do not need to take insulin compulsorily if they maintain a healthy lifestyle with proper physical activity and diet.

Prevalence of Diabetes

- Diabetes prevalence is high all around the world where the number of people diagnosed and suffering from diabetes was 108 million in 1980 that rose to 422 million in 2014 (WHO, 2020).
- The World Health Organization reported that in 2016, 1.6 million premature deaths were caused due to diabetes and WHO also mentioned diabetes as the 7th leading cause of deaths in the same year (WHO, 2020).
- Focusing on the European region of WHO, it is reported that there are more than 60 million people are suffering from diabetes that equals 10.3% of males and 9.6 females aged 25 years and over (WHO, 2016).
- In the European region, about 634,000 people died because of diabetes where 11% of them belong to the age group of 20-79 years old (WHO, 2016).

Prevalence	2018-19
England	3,319,266
Northern Ireland	99,833
Scotland	301,523
Wales	198,883
UK	3,919,505

- The prevalence of Diabetes is also high in the UK where more than 3.9 million people are suffered from diabetes (Diabetes UK, 2019). On the other hand, according to the "Diabetes Prevalence Model", it is estimated that about 4.8 million people are living with all types of diabetes in the UK and it will be on growing (Diabetes UK, 2019).
- In the UK, the prevalence of Type 1 diabetes is 10% among the people diagnosed with diabetes. It is reported that according to the current estimate the prevalence of type 1 diabetes among children and young people aged 15 years and below is 187.1 per 100,000 and the incidence in the same age group is 22.8 per 100,000 (Diabetes UK, 2017).
- In the UK, the prevalence of Type 2 diabetes is 90% among the people diagnosed with diabetes (Diabetes UK, 2017). Majority of these people aged over 25 years old because of different health issues.

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Impact of Diabetes on Physiology

- Type 1 diabetes is caused by the discontinuity of insulin production in the beta cells by the pancreas. As a result, the immune system of the human body fails to control the blood glucose level that leads to serious organ damage and sudden death.
- As the beta cells remain inactive and do not produce any insulin the body's immune system needs insulin intake on regular basis to maintain the blood glucose level.
- People diagnosed with type 1 diabetes usually suffer from different diseases because of the impact on the body organs and it becomes life-threatening if it remains untreated

- Type 2 diabetes is caused by either poor uptake of glucose or lack of serum insulin into the cells where the pancreas fails to maintain a balanced production of insulin. As a result, it leads to gradual impact and damage of body organs including kidney, liver, heart, and eye.
- As the beta cells in type 2, diabetes fails to produce a sufficient amount of insulin, the patients with type 2 diabetes need to maintain the blood glucose level and insulin production sufficient through a combined approach where medication, physical activities, and diets are maintained.

Causes of Diabetes

- The exact reason for occurring type 1 diabetes is unknown but it is addressed that the majority of the type 1 diabetes patients are children, adolescents, and young adults where the genetic factors are responsible for resulting this type of diabetes.
- Scientists also found that type 1 diabetes occurs because of environmental factors such as some viruses that trigger this disease.
- It is found that if the parent was diagnosed with diabetes before age 11, their child has the changes to get type 1 diabetes by double.
- If it is found that parents were diagnosed with type 1 diabetes, their child has the changes to get type 1 diabetes by 1 in 4.

- The reason for occurring type 2 diabetes is various where the unhealthy lifestyle, overweight or obesity, and genetics are the key causes for resulting type 2 diabetes.
- World Health Organization stated that the prevalence of diabetes in the European region is increasing day by day because of overweight or obesity, physical inactivity, and unhealthy diet (WHO, 2016).
- Due to overweight and obesity, the insulin produced inside the body can be effective to cover the entire body to control glucose and it leads to type 2 diabetes

- Taking insulin on daily basis is essential for type 1 diabetes patients where it is important to monitor the level of glucose in the blood. For this purpose, automatic medical tools are used on type 1 diabetes patients body that reminds the insulin taking time.
- A balanced diet with carbohydrate, fat, and protein is essential to continue for a type 1 diabetes patient which is an important part of the treatment.
- Regular exercise and maintaining a healthy weight are important where the type 1 diabetes patients must be under the monitoring of a GP or specialized doctor.

Case Study

Mrs. Julia is a woman diagnosed with multiple health issues including seronegative rheumatoid arthritis that is one of two types of rheumatoid arthritis. She was prescribed hydroxychloroquine tablets for her seronegative rheumatoid arthritis where hydroxychloroquine usually impacts the heart and lung. It was addressed that she did not smoke ever that is good for her arthritis because smoking can worsen arthritis. She has hypertension but no medication is followed by her. She is obese with BMI of 40.5 though her cholesterol level is normal and she has no sign of frequent urination. It was also identified that her obesity was removed because of medical issues. The important factor is that her mother had high blood pressure and cholesterol that may increase her risk of causing cardiovascular diseases in future. She needs to continue regular exercise to reduce her obesity that will be essential for reducing the risk of type 2 diabetes.

Health Consequences

- A significant number of type 2 diabetes patients experience foot ulcers that can lead to foot loss due to infection in the feet.
- Patients with type 1 diabetes can experience Hypoglycemia when the blood sugar level reduces below the dangerous level and lack of quick medical response can lead to serious internal organ damage or death.
- Hyperglycemia is also experienced by type 1 diabetes patients where a sudden rise of blood sugar can cause organ damage and deaths as well.
- Sudden weight loss can be experienced by type 1 diabetes patients.
- Kidney damage or failure can be caused to type 1 diabetes patients in case of strict control of lifestyle and medication.
- Microvascular complications inducing kidney damage, eyesight damage, and nerve damage can be experienced by type 1 diabetes patients that reduce that life expectancy.
- Macrovascular complications can be experienced by type 1 diabetes patients where heart diseases and stroke can lead to immature deaths.

- People who are diagnosed with type 2 diabetes will be facing some health consequences that are related to both physical and mental health.
- Disability and premature death are the common health consequences where people with type 2 diabetes face fatalities of 44% and people with type 1 diabetes face fatalities of 52%. So, the risk of premature death and disability of type 2 diabetes patients is higher (Diabetes UK, 2017).
- Individuals with type 2 diabetes have an increased risk of stroke within the first 5 years of diagnosis (Diabetes UK, 2017).
- People with type 2 diabetes also have the risk of different types of cardiovascular diseases as 50% of the people with type 2 diabetes die suffering from any cardiovascular disease including heart attack, stroke, and hypertension, etc.
- Kidney failure is a common physical health consequence among type 2 diabetes patients that can be faced by type 2 diabetes patients.
- Nerve damage issues can be experienced by type 2 diabetes patients where the common symptoms are numbness, pain, tingling, and weakness in the hands and feet.
- Eyesight can be reduced or damaged that can lead to partial or complete blindness of type 2 diabetes patients.

- Maintaining a proper diet is the key treatment for type 2 diabetes patients where they need to eat food that is rich in fiber and healthy carbohydrates. The need to eat at regular intervals to maintain a suggested quantity. Foods that are rich in oils, fats, and unhealthy carbohydrates must be avoided and sugary drinks and foods must be avoided as well. The patients with type 2 diabetes need to include more vegetables and fruits in their diet.
- Remain physically active is another key treatment for type 2 diabetes patients where daily physical activities must be maintained. Regular exercises such as walking, running, swimming, yoga, and aerobics can be effective to reduce overweight and help to control blood glucose levels.
- Medication is another part of the treatment of type 2 diabetes through a healthy diet and physical activities can help type 2 diabetes patients to control their diabetes effectively. Still, some medications are provided by doctors to establish effective control on type 2 diabetes including metformin for lowering the increased blood glucose level. Sulfonylureas are prescribed to increase insulin production where meglitinides are also prescribed to help the pancreas to produce insulin for short-term impact (Croniger, 2015). On the other hand, in the case of managing increased blood glucose, insulin intake is prescribed to type 2 patients.

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