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ACCESS TO DIABETES CARE: IF NOT NOW, WHEN?

BY: PRAFULLATA S

Assistant Professor, SDM College of Nursing University, Dharwad, Karnataka, India

*Corresponding Author: prafulns@gmail.com

Leonard Thompson received the first successful injection of insulin.

The year 2021 marks 100 years since the discovery of a treatment that saved millions of lives around the world– insulin.

Key facts

•**D**iabetes has been increasing in prevalence over the last few years. By 2025, it is estimated there will be 422 million people suffering from the condition worldwide – an increase of more than 40% on current figures! (Source: International Diabetes Federation)

•Close to half a billion people live with diabetes worldwide.

•Prevalence has been accelerating more in low- and middle-income countries than in high-income countries.

•Diabetes is a major cause of many serious diseases such as blindness, kidney failure, heart attacks, stroke and lower limb amputation.

•Diabetes and its consequences can be treated and can be avoided or delayed with lifestyle modification such as proper diet, physical activity, medication and regular screening and treatment for complications.

WORLD DIABETES DAY: Access to Diabetes Care is the theme for World Diabetes Day 2021-23.

It was in 1991 World Diabetes Day was first observed by International Diabetes Federation {IDF} and the World Health Organization in order to respond to growing concerns over an alarming rise of

diabetes cases. The purpose of the day was to create awareness of Diabetes that millions of people all around the world lived with every day.

World Diabetes Day falls on Sunday 14th November. This date was picked as it's also marks the birthday of Sir Frederick Banting – the medical scientist who discovered insulin along with Charles Best.

Diabetes is a serious, potentially debilitating and life-threatening non-communicable disease that imposes a heavy impact not only individuals but their families as well as , and also impacts the healthcare systems and national economies. Especially in low and middle-income countries.

Diabetes is a chronic disease that occurs when either the pancreas do not produce enough insulin or when the body is unable to effectively use the insulin it produces. The body 's blood sugar level is regulated by the hormone called Insulin secreted by the pancreas.. Hyperglycemia, or raised blood sugar, is a common effect of uncontrolled diabetes which leads to various complications involving variuos body's systems.

Types of diabetes:

1. Type 1 diabetes formerly known as insulin-dependent, juvenile or childhood-onset is characterized by deficient insulin production and requires daily administration of insulin .Symptoms occur suddenly which includes polyuria, polydipsia, constant hunger, weight loss, vision changes, and fatigue. Approximately half of people are estimated to be living with diabetes remain undiagnosed. Type 1 diabetes if left untreated can turn out to be fatal.

2. Type 2 diabetes it was formerly known as non-insulin-dependent or adult-onset results from the body's ineffective use of insulin. More than 95% of people with diabetes suffer from type 2 diabetes. It is largely the result of excess body weight and sedentary lifestyle. Symptoms may be similar to those as in type 1 diabetes but are often less significant . Resulting in delayed diagnosis after the onset and arising of complication. But recent studies have showed that type 2 diabetes which once was seen in adults has become increasingly in children.

3. Gestational diabetes occurs during pregnancy ,it is hyperglycemia with blood glucose values above normal but below those diagnostic of diabetes. Women with gestational diabetes are at an increased risk of complications during pregnancy and during delivery. they don't carry the risk of developing type 2 diabetes but also their children in future. Gestational diabetes is diagnosed during prenatal screening, rather than through reported symptoms.

Prevention: Simple lifestyle modification measures have proved to be very effective in preventing or delaying the onset of type 2 diabetes

1.Maintain a healthy body weight;

2.being physically active – at least 30 minutes of regular, moderate-intensity activity. More activity aids in for weight control;

3.Eat a healthy diet, avoid sugar and saturated fats

4.Avoid smoking and tobacco use as it increases the risk of diabetes and cardiovascular disease.

INCREDIBLE DISCOVERY OF INSULIN

Insulin was discovered by Sir Frederick G Banting ,Charles H Best and JJR Macleod at the University of Toronto in 1921 and it was eventually purified by James B Collip.

Many efforts were put in to discover Insulin .initially the progress was slow and many a times many of their experiments failed, but Banting and the team saw regular drops in blood sugar levels as a result of their extract, and were confident they were on to something big and incredible . Finally in November, they were successful in treating a dog with diabetes with their insulin extract for 70 days.

•17 May 1921 – Experiments started

Banting, Best and Macleod first got together to begin their research and set out about figuring how to extract insulin from the dog's pancreas. The method involved tying off the pancreatic duct to destroy other substances in the pancreas that would destroy insulin, but leave the islets intact. The remaining extract would then be given to other dogs who didn't produce any of their own insulin because their pancreases had been removed to work out the effects on their blood sugar levels.

It was Macleod who provided Banting with the lab needed to conduct their experiments and brought in a research student to help called Charles Best, Best specialized in testing blood to check glucose level,this way they would know whether their insulin extracts were having any benefit.

•In May 1921, the synthesis commercially available insulin first began in Toronto, Canada.Frederick Banting and Charles best experimented on a number of diabetes-induced dogs with very limited success. A major breakthrough came when a dog, named Marjorie by the Toronto team, survived for 70 days with injections of the pancreatic extract, or 'Isletin' as the team called it.

•11 January 1922: – insulin was first used on human to treat diabetes

Banting and Best took a vial of the pancreatic extract to Toronto General Hospital and administered it to a 14 year-old Leonard Thompson.

•In January 1922, Leonard Thompson, a 14-year-old boy dying from type 1 diabetes, became the first person to receive insulin injection. The dangerously high blood sugar levels dropped down within 24 hrs, unfortunately he developed an abscess at the site of the injection and still had high levels of ketones.

Collip worked day and night on purifying the extract furthermore, and a second shot of insulin was administered to Leonard on 23 January 1922. It was a complete success as Leonard's blood sugar levels dropped to near-normal, with no side effects. In history for the first time type 1 diabetes was not a death sentence.

•25 October 1923 – Nobel Prize award , Banting and Macleod were jointly awarded the 1923 Nobel Prize in Physiology or Medicine in recognition of their life-saving discovery

The WHO Global Diabetes Compact

Global Diabetes Compact was launched at Global Diabetes Summit, co-hosted by the World Health Organization, the Government of Canada along with the support of the University of Toronto,on 14 April 2021,responding to the increasing burden of diabetes around the world. The launch coincided with the landmark of celebrating 100th anniversary for the discovery of insulin since 1921.

It is a global initiative aiming for sustained improvements in diabetes prevention and care, with a particular focus on supporting low- and middle-income countries.

Its aims in bringing together the national governments, UN organizations, nongovernmental organizations, private sector entities, academic institutions, and philanthropic foundations, people living with diabetes, and international donors to work on a shared vision of reducing the risk of diabetes and ensuring all people who are diagnosed with diabetes have access to equitable, comprehensive, affordable and quality treatment and care.

It will also support the prevention of type 2 diabetes from risk factors such as obesity, unhealthy diet and physical inactivity.

As per WHO ,as the world continues to live through the Covid-19 pandemic, this year World Diabetes Day "comes at a time which results in a high proportion of people with diabetes with serious manifestations of Covid-19 and those who have succumbed to the virus and has also led to severe disruption of diabetes services."

Therefore once diabetes is diagnosed, treatment should be immediately started in consultation with the doctor and the lifestyle changes mentioned above should be incorporated along with other pharmacological interventions

CONCLUSION

Universal access to insulin for all who require it remains a global challenge.Being complex and myriad the access and affordability are really complex and myriad , reflecting the multiple steps involved in the business namely production, distribution and pricing, as well as the infrastructure required to ensure the correct and safe use of insulin.

The numbers, the influence and the strong will to bring about meaningful change unitedly the global diabetes community has it all. We deeply owe it to all the millions of families affected by diabetes and also to the legacy of Banting and Best. Collectively, we must encounter the burning question on the lips of many who may not be able to ask it for themselves: "how much longer?"

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