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To achieve the highest knowledge in a subject and become its master is an herculean task, to achieve the same singlehandedly is almost impossible. To make things possible with a smooth transition from impossible to the successful achievement is the result of encouragement and motivation. It becomes incumbent therefore to reciprocate the same in form of acknowledgement.

Nothing splendid has ever been achieved except by those who dared believe that something inside them was superior to circumstances – Bruce Barton

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Creativity is finding new things .... or expressing old truths in new ways.

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Dr. Seema Hallikerimath

LIST OF ABBREVIATIONS

AAG : Acid Alpha Glucosidase

AGE : Advanced Glycation End products

BMI : Body Mass Index

CAD : Coronary artery disease

CAMP : Cyclic adenosine monophosphate

CVD : Cardiovascular Disease.

DKA : Diabetic ketoacidosis

DRS : Diabetic Retinopathy Study

DSME ; Diabetes self-management education

ETDRS : Early Treatment Diabetic Retinopathy Study

FBS : Fasting Blood Sugar

FFA : Free Fatty Acid

FPG : Fasting Plasma Glucose

F.Sal : Fasting Saliva

GCT : Oral glucose load (glucose challenge test

GDM : Gestational Diabetes Mellitus

GLUT : Glucose transporters

GSD : Glycogen storage disease

IADPSG : International Association of Diabetes and Pregnancy Study Groups

IAPP : Islet amyloid polypeptide

ICMR : Indian Council of Medical Research

IDDM : Insulin Dependent Diabetes Mellitus

IFG : Impaired fasting glucose

IGT : Impaired glucose tolerance

IRS :Insulin Receptor Substrate

JNK : Jun amino-terminal(NH_2) kinase

LADA : Latent Autoimmune diabetes in Adults

MHC : Major Histocompatibility Complex

NGSP : National Glycohemoglobin Standardization Program

PBS : Post Blood Sugar

PP Sal. : Post prandial saliva

PKC : Protein Kinases C

RAGE : Receptors for AGE

RNS : Reactive nitrogen species

ROS : Reactive oxygen species

SAPK : Stress Activated Protein Kinase.

SMBG- : Self Monitoring of Blood Glucose

UKPDS : UK Prospective Diabetes Study

VADT : Veterans Affairs Diabetes Trial

WHO : World Health Organization

MNT : Medical Nutritional Therapy

ABSTRACT

Type-2 diabetes accounts for more than 90% of all diabetes worldwide. Over 100 million people worldwide have type-2 diabetes, and the prevalence is increasing dramatically in both the developed and developing worlds. Type-2 diabetes is a lifelong illness, which generally starts in middle age or later part of life, but can start at any age. It has a different cause than Type-1. Patients with type-2 diabetes do not respond properly to insulin, the hormone that normally allows the body to convert blood glucose into energy or store it in cells to be used later. The problem in type-2 diabetes is not lack of insulin production; most of these patients produce variable, even normal or high, amounts of insulin. The first stage in type-2 diabetes is the condition called insulin resistance. Insulin helps glucose to enter cells, where it is used for energy. In patients with insulin resistance, although insulin can attach normally to receptors on liver and muscle cells, certain mechanisms prevent insulin from moving glucose into these cells where it is utilized. As a result body starts making more and more insulin and in the beginning, this amount is usually sufficient to overcome such resistance, but during the later phases of the disease the insulin resistance increases in severity and, blood glucose increases, but at the same time the body is unable to use it properly, and the bodys cells are actually starving for energy. Even with increased amounts of insulin the insulin demands of the body is not met because of the increasing tissue resistance. Because the body does not use insulin properly, blood glucose rises above the safe level. The initial effect at this stage may be an abnormal rise in blood glucose right after a meal (called postprandial hyperglycemia)

The consequences of sustained poor blood glucose control can be severe in all forms of diabetes and include damage to the eyes, kidneys and nerves, as well as increased risk of complications in the larger blood vessels (leading to heart attacks and strokes). Type-2 diabetes tends to run in families. Though there are many available and effective treatments

for type-2 diabetes, it may be extremely difficult to achieve the desired ultimate target namely, lifelong restoration of normal glucose control. Not everyone with type-2 diabetes needs medicines or insulin replacement therapy and many can be treated with diet modifications and exercise.

These are the classical symptoms of diabetes

- Frequent urination because of large volume of urine (polyuria),
- Excessive thirst (polydipsia),
- Hunger and eating more (polyphagia), and
- Loss of weight despite eating more

Less common symptoms may include:

- Tiredness
- Head aches and pains
- Blurring of vision
- Dry skin
- Dry mouth,
- Impotence (in a male)
- Vaginal yeast infections (in a female)
- Difficulty in healing of cuts and scrapes, or
- Excessive infections or infections with unusual bugs

The goal of diabetes treatment is to keep your blood sugar level as close to normal as possible. Monitoring allows them to make immediate changes in their treatment plan when needed.

As many as 65% of diabetic people (4-5 million people) perform some degree of self-monitoring and approximately 20-30% do so frequently. Most patients consider this the most

onerous part of their diabetes therapy. It requires obtaining blood, frequently in public, and is usually the most painful part of therapy, being significantly more painful than insulin self-administration. Patients therefore are anxious for a less-invasive method for glucose measurement. Methods exist or are being developed for minimally invasive glucose monitoring, which use body fluids other than blood (e.g., sweat and saliva), subcutaneous tissue, or blood measured less invasively.

The highly sensitive test procedures that are now commonplace make it practical to quantitate, despite very low concentrations a large number of hormones and drugs in saliva. Tests based on saliva have already made substantial inroads into diagnosis. For some molecules – for example, antibodies, unconjugated steroids, hormones and certain drugs – the techniques are sufficiently sensitive to reflect blood concentrations of the substance accurately

The following study explores the possibility of using saliva to reflect the glucose concentration in blood, thereby making self-measurement of glucose less invasive.

CONTENTS

LIST OF TABLES

LIST OF GRAPHS