Diabetes mellitus is a metabolic disorder defined by chronic hyperglycemia with deranged fat, carbohydrate and protein metabolism that results from improper secretion or action of insulin\textsuperscript{1}. It is a modern day epidemic. The WHO Global Report on Diabetes has revealed that the number of adult diabetics in the world was 422 million in 2014 in comparison to 108 million in 1980\textsuperscript{2}. The age standardized prevalence of diabetes has become 8.5% in the adult population, almost double that of the 4.7% in 1980. More than 80% of deaths due to diabetes occur in middle and low income countries\textsuperscript{3,4}. WHO estimates that diabetes will become the seventh most common cause of mortality, worldwide, in the year 2030\textsuperscript{5}. India is the diabetes capital of the world because there are around 41 million Indians suffering from diabetes till date and every fifth person in world, having diabetes, is an Indian\textsuperscript{6,7}. Affecting 30+ million Americans and growing at an alarming rate. Recent studies have revealed that the occurrence of diabetes mellitus is increasing among children and adolescents in India\textsuperscript{8,9,10}.

Screening for glucose intolerance in all children and adolescents is not recommended in the current scenario, however it is recommended in high-risk populations\textsuperscript{11}. There are two main types of diabetes mellitus (DM): Type 1 DM results from the inability of the pancreas to produce enough insulin. Its cause is unknown\textsuperscript{12}. Type 2 DM occurs due to insulin resistance, in which the peripheral cells fail to respond to insulin properly. As the disease progresses, failure to produce insulin may also occur. The most common risk factor of type 2 DM is excessive body weight and sedentary lifestyle. Type 2 DM accounts for more than 90% of the diabetes cases worldwide. It is difficult to diagnose early, as it is mostly asymptomatic and usually presents with complications like nephropathy, cardiovascular disease, retinopathy, neuropathy, cerebrovascular disease and peripheral vascular disease\textsuperscript{12}. It can go undetected for 9–12 years and, consequently, present with complications\textsuperscript{13}. 
Recent studies have revealed that around half of the diabetics in the world are undiagnosed. American Diabetic Association has introduced a new category of blood glucose levels, preceding the onset of diabetes, known as prediabetes. Individuals with prediabetes, have a higher risk of development of diabetes in the future. American Diabetic Association has defined prediabetes as Impaired Fasting Glucose, when fasting plasma glucose level ranges from 100 to 125 mg/dl and Impaired Glucose Tolerance, when plasma glucose level 2-h after an oral glucose tolerance test ranges from 140 to 199 mg/dl.

**Prediabetes as per American diabetes association:**

**A1C:**

The A1C test measures your average blood glucose for the past 2 to 3 months. The advantages of being diagnosed this way are that you don't have to fast or drink anything. Diabetes is diagnosed at an A1C of greater than or equal to 6.5%.

**Fasting Plasma Glucose (FPG):**

This test checks your fasting blood glucose levels. Fasting means after not having anything to eat or drink (except water) for at least 8 hours before the test. This test is usually done first thing in the morning, before breakfast. Diabetes is diagnosed at fasting blood glucose of greater than or equal to 126 mg/dl.

**Oral Glucose Tolerance Test (also called the OGTT):**

The OGTT is a two-hour test that checks your blood glucose levels before and 2 hours after you drink a special sweet drink. It tells the doctor how your body processes glucose. Diabetes is diagnosed at 2 hour blood glucose of greater than or equal to 200 mg/dl.
Screening for prediabetes can lead to early diagnosis and treatment and prevention of complications\textsuperscript{16}. Keeping in view that the onset of glucose intolerance can occur in the adolescent age group and that early diagnosis can prevent grave complications of diabetes, it is the need of the hour to identify those adolescents who are at risk. Since very few studies have been conducted among Indian adolescents, this study was planned to find out the cut-off values of BMI and waist circumference for predicting pre-diabetes in adolescents in the Indian population.

### Criteria for Testing for Diabetes or Prediabetes in Asymptomatic Adults

- Testing should be considered in adults who are overweight (BMI ≥25 kg/m\textsuperscript{2} or ≥23 kg/m\textsuperscript{2} in Asian Americans) and have additional risk factors:
  - Physical inactivity.
  - First-degree relative with diabetes. High-risk race/ethnicity (e.g., African American, Latino, Native American, Asian American, Pacific Islander).
  - Women who delivered a baby weighing >9 lb or were diagnosed with GDM.
✓ Hypertension (≥140/90 mmHg or on therapy for hypertension).
✓ HDL cholesterol level <35 mg/dL (0.90 mmol/L) and/or a triglyceride level >250 mg/dL (2.82 mmol/L).
✓ Women with polycystic ovary syndrome.
✓ A1C ≥5.7%, IGT, or IFG on previous testing.
✓ Other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans).
✓ History of CVD.

FENUGREK:

Fenugreek is a plant that grows in parts of Europe and western Asia. The leaves are edible, but the small brown seeds are famous for their use in medicine. Fenugreek seeds may be helpful to people with diabetes. The seeds contain fiber and other chemicals that slow digestion and the body’s absorption of carbohydrates and sugar. The seeds may also help improve how the body uses sugar and increases the amount of insulin released. Few studies support fenugreek as an effective treatment for certain conditions. Many of these studies focus on the seed’s ability to lower blood sugar in people with diabetes. One study\textsuperscript{17} found that a daily dose of 10 grams of fenugreek seeds soaked in hot water may help control type 2 diabetes. Another study\textsuperscript{18} suggests that eating baked goods, such as bread, made with fenugreek flour may reduce insulin resistance in people with type 2 diabetes. An additional study showed that taking high doses of fenugreek every day for several weeks causes noticeable improvements in plasma glucose levels. But long-term plasma glucose levels weren’t measured in this study.
The amounts of fenugreek used in cooking are generally considered safe. When taken in large doses, side effects can include gas and bloating. Fenugreek seeds have a bitter, nutty taste. They’re often used in spice blends. Indian recipes use them in curries, pickles, and other sauces. You can also drink fenugreek tea or sprinkle powdered fenugreek over yogurt. Dietitian will help us for adding of fenugreek into our current diabetes meal.

There have not been any serious or life-threatening side effects or complications connected with fenugreek. One study even found that fenugreek can actually protect your liver from the effects of toxins. One study also suggests that fenugreek can stop the growth of cancer cells and act as an anticancer herb. Fenugreek can also help alleviate the symptoms of dysmenorrhea. This condition causes severe pain during menstrual cycles.

**TRADITIONAL TREATMENTS FOR DIABETES**

Along with fenugreek, we have other options for treating diabetes. Keeping blood sugar at normal levels is essential to maintaining a high quality of life with a diagnosis of prediabetes. We can help our body maintain healthy blood glucose levels by making lifestyle changes, including:

- Sticking to a diet of foods with little processed foods and high amounts of fiber, such as whole grains, vegetables, and fruits
- Choosing lean protein sources and healthy fats, and avoiding excessive processed meat, boxed and processed foods, and sweetened beverages
- Being active at least half an hour a day, at least five days a week