The Killer Lie: Pre-Diabetes

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A metabolic condition affecting chronically wherein blood glucose levels are above the threshold levels considered to be normal and well below the threshold levels for conformation of diabetes (Colberg et al., 2016). It is thought to be a metabolic syndrome; which can affect endless number of people creating a burden on economy of country. A physiological state of human body which causes altered fasting glucose levels (100-125 mg/dl), impaired glucose tolerance (blood glucose level 140-199 mg/dl on a 75gm oral glucose tolerance test) and elevated HBA1c levels which can range in-between 5.7% and 6.4% (Screening & Intervention, 1999). The up-said screening criteria has been documented by both WHO and ADA (Screening & Intervention, 1999).

Following table demonstrates the diagnostic levels of blood sugar from normal to pre-diabetes and diabetes.

<table>
<thead>
<tr>
<th>Diabetic test</th>
<th>Normal</th>
<th>Prediabetes</th>
<th>Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemoglobin A1c, %</td>
<td>&lt; 5.7</td>
<td>5.7–6.4</td>
<td>≥ 6.5</td>
</tr>
<tr>
<td>Fasting blood glucose, mg/dL</td>
<td>&lt; 100</td>
<td>100–125</td>
<td>&gt; 125</td>
</tr>
<tr>
<td>Oral glucose tolerance, mg/dL</td>
<td>&lt; 140</td>
<td>140–199</td>
<td>&gt; 199</td>
</tr>
</tbody>
</table>

Table 1: ADA Diagnostic criteria for Normal, Prediabetes, Diabetes.

Symptoms

The following symptoms are prevalent in prediabetics. Any increase in one or all of the them can lead to full blown diabetes

a) Unusual frequency of urination
b) Feeling very thirsty even after drinking adequate water
c) Excessive fatigue
d) Blurry vision
e) Slow healing
f) Tingling sensation in feet and hands.

Diagnosis:

ADA Risk Test could be used as a standard format for assessing the individuals already suffering from Prediabetes; on higher risk for developing pre-diabetes. Following the test; decision pathway can be followed for patients identified at high risk of conversion of prediabetes to type 2 diabetes.
Care about Pre-diabetes: Should we?

Pre-diabetes if not treated well, leads to full blown diabetes thereby causing its burden on patient in form of complications. Some of them to name are:

a. Diabetic ocular diseases
b. Depression
c. Alzheimer’s disease
d. Cardiovascular diseases
e. Diabetic nephropathy
f. Diabetic neuropathy
g. Skin troubles
h. Pancreatic cancer
i. Sexual dysfunction (R. M. M. Khan et al., 2019)

There is an established link between cardiovascular comorbidity and Pre-diabetes commonly appearing as coronary artery disease and diastolic heart failure (Zand, Ibrahim, & Patham, 2018). Patients with pre-diabetes can be classified as per following criteria for risk of cardiovascular disease; one of the most life threatening comorbidity.
**Very high risk**
Patients with DM and established CVD and/or target organ damage or presence of 3–4 major risk factors or early onset of type 1 DM of duration >20 years.

**High risk**
Patients with DM; duration > 10 years without any target organ damage along with any other additional risk factors.

**Moderate risk**
Young patients with T1DM aged <35 years or T2DM aged <50 years) with DM duration <10 years without other risk factors.

<table>
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<tr>
<th>Table 2: Cardiovascular risk categories of patient with pre-diabetes progressing to diabetes. (Cosentino et al., 2020)</th>
</tr>
</thead>
</table>

**Treatment strategies**

Pre-diabetes is a condition which can be adequately reversed thereby saving patients from diabetes and its long term complications.

Exercise, lifestyle modifications along with dietary regulations has been sought after as the most viable concept of prevention of pre-diabetes turning into diabetes and reversal of diabetes too (Zand et al., 2018). All the patients with pre-diabetics should undergo one or all of the following (Tuso, 2014):

1. **Life style modification training/ behaviour modification strategies**

2. **Physical activity:**
   a. Moderate intensity aerobic activity like brisk walking ranging up to ≥ 150 min/week. Patient can be advised to start at 10 min/day progressing on to 30 min/day and then at last finally ≥ 150 min/week. Frequency of exercise can be kept 3 to 5 days a week.
   b. HIIT and continuous exercise training can be inculcated as type of exercise along with using aerobic exercise intervention.
   c. Resisted exercises can also be used as a type of the exercise intervention. Patient should be made to do 8–10 different types of exercises with 1–3 sets of those exercises done for 10 –15 repetitions, till patient presents with symptoms of near fatigue (early in training) can be used as a protocol.
   d. Flexibility and balance training: Static or dynamic stretch, wherein hold is of 20-30 sec and up to 5 repetitions /set is given initially. Both these Interventions are given 2 to 3 days/week (Colberg et al., 2016)
   e. Decreasing excessive sedentary time in day to day life can also be equally effective for pre-diabetics.

3. **Daily calorie intake of 1200-1800kcal/day** (Zand et al., 2018)

4. **7% weight loss is required if BMI exceeds 25 kg/m².**

5. **Diabetes self-management and support:** Diabetes self-management protocols consisting of education and support programs can be good arenas for the patients with pre-diabetes to get educated and have support for development and maintenance of behaviours that can reverse pre-diabetes or delay onset of type 2 DM.

With an increasing number of pre-diabetics worldwide, there is a dire need for multidimensional treatment strategies for patients with pre-diabetics. Referring patients to endocrinologists could also be helpful in
providing complete care for pre-diabetics. An intelligent approach towards pre-diabetics management can help in reversal of disease thereby decreasing the disease quotient.

Bibliography


