

Short Communication

A Lifestyle Risk Factors for Prediabetes and Diagnosis and Treatment

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Keywords: blood glucose levels, prediabetes, hyperglycemia, idiopathic polyneuropathy

Abstract

Prediabetes is an intermediate state of hyperglycemia with glycemic parameters above normal but below the diabetes threshold. While, the diagnostic criteria of prediabetes are not uniform across various international professional organizations, it remains a state of high risk for developing diabetes with yearly conversion rate of 5%-10%. Observational evidence suggests an association between prediabetes and complications of diabetes such as early nephropathy, small fiber neuropathy, early retinopathy and risk of macrovascular disease. Several studies have shown efficacy of lifestyle interventions with regards to diabetes prevention with a relative risk reduction of 40%-70% in adults with prediabetes.

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Introduction

Prediabetes is increasingly recognised as an important metabolic state; as well as predisposing individuals to a high probability of future progression to diabetes, individuals with prediabetes are at increased risk of developing many of the pathologies normally associated with that disease, such as diabetic retinopathy, neuropathy, nephropathy and macrovascular complications. In a cohort of individuals from the Diabetes Prevention Program (DPP), who were at high risk for developing diabetes, the prevalence of diabetic retinopathy was 7.9%. In a different study, the prevalence of peripheral neuropathy was higher in those with prediabetes than in those with normal glucose tolerance, and was similar to that in participants with recently diagnosed diabetes.

Prevalence of prediabetes

Prevalence estimates of prediabetes reported in the literature vary greatly, due to the diagnostic criteria used, the choice of test and due to the populations being studied. The lower cut-off defined by the ADA guidelines lead to much higher prevalence rates compared with those defined by WHO guidelines; in a cohort of 1547 American adults without diabetes, changing the lower IFG threshold from 110 mg/dL to 100 mg/dL resulted in an increase in prediabetes prevalence from 19.8 to 34.6%. A large meta-analysis of studies that reported prevalence in Caucasian and Asian cohorts estimated IFG prevalence at 36.0% using WHO guidelines and 53.1% using ADA guidelines.

Global variability in prediabetes prevalence

The complexities of prediabetes identification, described above, can make it challenging to gain an overview of relative prediabetes prevalence from the literature. However, the IDF have published a comprehensive picture of the current and future trends of prediabetes prevalence based on IGT in individuals aged 20–79 years. The global prevalence of IGT was estimated at 7.3% of the adult population in 2017, equivalent to 352.1 million individuals. By 2045 the prevalence is anticipated to increase to 8.3% of the global adult population, equivalent to an estimated 587 million individuals. There is no significant difference of prevalence in men and women, and around half of all individuals with IGT are aged under 50 years. Unadjusted regional prevalence is currently highest in the North America and Caribbean (15.4%) and Central and South America (10.0%) IDF regions, and lowest in the South East Asia (3.0%) and European (5.5%) regions.

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Pharmacotherapy

Several groups of antidiabetic drugs such as Biguanides, Thiazolidinediones, α -Glucosidase Inhibitors, GLP-1 analogies and non-antidiabetic drugs and therapies such as anti-obesity drugs, and bariatric surgery have been studied in context of prediabetes.

Metformin has been used for several decades for treatment of diabetes and has been noted to have additional favorable outcomes such as body mass index (BMI) reduction and improved cholesterol profile. The collective evidence of trials among subjects with IGT, suggests a 45% risk reduction for development of type 2 diabetes.

Anti-obesity drugs Orlistat has also been studied in context of prediabetes. Orlistat is a gastrointestinal lipase inhibitor used for treatment of obesity that acts by inhibiting the absorption of dietary fats by approximately 30%. Research has shown that over a 1.5 year follow-up period, use of Orlistat in conjunction with low energy diet is associated with greater weight loss as compared to placebo (6.7 kg vs 3.8 kg) and a decrease in conversion rate from IGT to overt diabetes (7.6% vs 3.0%) in obese adults.

Factors that affect prevalence rates of prediabetes

A complex interaction of further factors that include life expectancy, socioeconomic status, wealth, access to healthcare services, levels of education, exposure to disease/public health awareness initiatives, and regional levels of obesity influence prevalence rates. As populations become more urbanised, become wealthier, gain better access to nutrition, healthcare and education, and live longer, rates of prediabetes are expected to increase.

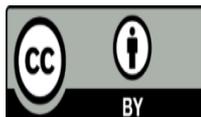
Conclusion

Prediabetes is common and a major public health issue globally. Individuals with prediabetes have a high risk of progression to diabetes and elevated risks of cardiovascular disease, kidney disease, and death. Lifestyle modification is the first-line therapeutic approach to prediabetes but is often difficult to sustain in practice. A lifestyle approach has a number of advantages, including potential cost-effectiveness and the adaptability to various settings worldwide. However, several challenges have limited cogent prediabetes treatment strategies, including the lack of a standardized clinical and public health approach for individuals with prediabetes as well as issues related to cost and reimbursement.

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