Diabetes evolves through prediabetes, defined as impaired fasting glucose (IFG) and/or impaired glucose tolerance (IGT). Subjects with IFG/IGT have an increased risk of developing diabetes and a higher prevalence of cardiovascular disease than normoglycemic individuals. However, there is considerable evidence that glucose levels lower than those meeting the current definition of prediabetes may also be associated with similar concerns, particularly in high-risk individuals in accordance with a continuous glycemic risk perspective. Therefore, an absolute definition of prediabetes may underestimate the implications and vastness of this disorder. Research should focus on these aspects to minimize the risk of developing a preventable condition.

Identifying individuals at increased risk of developing diabetes has assumed increasing importance with the expansion of the evidence from clinical trials on the prevention or delay of type 2 diabetes using lifestyle modification and medication. The epidemiology of prediabetes depends on the diagnostic method used. Glucose measures defining impaired glucose tolerance and impaired fasting glucose levels identify about 10% of the adults to have prediabetes, whereas glycated hemoglobin–based criteria identify a significantly lower proportion of the population. Increasingly, multifactorial risk tools are being used and cut-points set to identify approximately 15% of the population as being at high risk.

Although the state of prediabetes is defined by its role as a diabetes risk factor, it also carries a significant risk of cardiovascular disease, independent of progression to diabetes. Typical diabetic microvascular complications also occur, albeit at low rates, in prediabetes. There is evidence that both glucose-related and glucose-independent mechanisms contribute to these vascular complications. Effective preventive strategies will likely require control of glycemia, as well as other metabolic risk factors. This article reviews some of the proposed mechanisms for the vascular complications of the prediabetic state.

Prediabetes encompasses conventional diagnostic categories of impaired fasting glucose and impaired glucose tolerance but is a band of glucose...
concentrations and a temporal phase over a continuum extending from conventional normal glucose tolerance to overt type 2 diabetes. Insulin resistance and defective glucose sensing at the β-cell are the central pathophysiologic determinants that together cause hyperglycemia. Regardless of the cellular origin of insulin resistance, excessive tissue fat utilization is a consistent metabolic mechanism. Although genetic influences affect β-cell function, becoming overweight is the main acquired challenge to insulin action. The phenotype of prediabetes includes dyslipidemia and higher arterial blood pressure.

Diagnosis of Prediabetes
Jonathan Shaw

A rational approach to diagnosing prediabetes is essential to identify those who would benefit from entering diabetes prevention programs. Impaired fasting glucose and impaired glucose tolerance are similar in relation to their ability to identify those at risk of diabetes or cardiovascular disease; however, because they identify different segments of the at-risk population, there is value in undertaking glucose tolerance testing to ensure that both conditions can be diagnosed. Simple noninvasive diabetes risk scores offer a valuable entry point in the diagnosis of prediabetes, enabling the identification of those who need blood testing.

Diabetes Prevention Programs
A. Ramachandran and C. Snehalatha

Primary prevention of type 2 diabetes is effective for curbing its epidemic. Lifestyle intervention has been found to be a highly effective, safe, and cost-effective method for the prevention of diabetes in high-risk persons, the benefit of which can extend for many years. Among the pharmacologic agents studied for prevention of diabetes, metformin has been found to be the safest. Interventions using drugs are less preferred because the drugs' effects tend to dissipate after their use is stopped and adverse effects may also result. The major challenge is to translate current knowledge into prevention programs at the national level.

The Economics of Diabetes Prevention
William H. Herman

In the United States, the costs associated with diabetes mellitus are increasing. Although people with diabetes comprise less than 6% of the US population, approximately 1 in 5 health care dollars is spent caring for people with diabetes. Healthy lifestyle interventions for the general population and intensive lifestyle and medication interventions for high-risk individuals present opportunities for diabetes prevention. This article describes the costs associated with glucose intolerance and diabetes, the effect of glucose intolerance and diabetes on the quality of life, and the cost-effectiveness of screening and primary prevention interventions for diabetes prevention.

Treatment Recommendations for Prediabetes
Robert E. Ratner and Anpalakan Sathasivam

A variety of definitions and diagnostic cutpoints have been promulgated for prediabetes without universal agreement. Professional organizations
agree that current scientific evidence justifies intervention in high-risk populations for the delay or prevention of progression to diabetes. Lifestyle intervention is universally accepted as the primary intervention strategy. Secondary intervention is advocated in high-risk individuals or in the absence of a clinical response to lifestyle modification.

Public Health Implications: Translation into Diabetes Prevention Initiatives—Four-Level Public Health Concept

Peter E.H. Schwarz

Many countries are struggling to meet the health care needs of a rapidly growing number of individuals with common chronic illnesses, especially diabetes mellitus. Incorporating the evidence from prevention trials into clinical practice represents one of the major challenges for public health, and the medical community is still learning how this can best be achieved at a population level. A 4-level public health initiative has been initiated that provides guidance for establishing milestones and strategies for such a program.

Glycemic Status, Metabolic Syndrome, and Cardiovascular Risk in Children

Gerald S. Berenson, Mehmet Agirbasli, Quoc Manh Nguyen, Wei Chen, and Sathanur R. Srinivasan

The metabolic syndrome and adult manifestation of prediabetes and diabetes are major public health problems that begin in childhood. Prevention must be considered as a serious public health issue. Health education and health promotion of school children needs incorporation as a community effort.

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