Sub Clinical Diabetes - Vascular Threat to Asian Indians

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Diabetes is the commonest metabolic disorder which still in the year 2003 remains incurable. Although defined on the basis of elevated plasma glucose levels, it is clear that diabetes is characterized by many associated abnormalities. More significantly, they predispose affected individuals to severe serious chronic problems. However, it is imperative for physicians to identify ‘subclinical’ diabetes to intercept the disease process. The values of impaired glucose tolerance for subclinical diabetes are likely to emerge due to vascular impact of the disease. Diabetes is now an independent risk factor for future cardiovascular (CV) events in the general population and in people with previous CV disease. The plasma glucose level is a continuous risk factor for CV events in people with Diabetes.

How were the plasma glucose cutoffs that define diabetes chosen?

Chronic hyperglycemia is usually asymptomatic and in fact, the diagnostic plasma glucose cutoffs for diabetes were based on those glucose levels above which various cohorts of people followed prospectively had a high incidence of retinal lesions and albuminuria. The glucose levels that differentiated people at risk from those not at risk were a 2-hour plasma glucose level > 200 mg% (>11.1 mmol/L) following a 75-g oral glucose challenge. Subsequent studies have also established that a fasting plasma glucose indeed, it has almost 100% specificity for a diagnosis of diabetes when diabetes is diagnosed on the basis of a 2-hour glucose tolerance test. It is important to note, however, that the fasting plasma glucose has low sensitivity; lower fasting plasma glucose levels do not rule out diabetes that is defined on the basis of an oral glucose tolerance test, and up to 50% of individuals without previous diabetes who have a fasting plasma glucose level below the diagnostic cutoff of < 126 mg% (7.0 mmol/L) may have 2-hour glucose levels > 200 mg% (>11.1 mmol/L). Therefore, the fasting glucose cannot be used to definitively exclude diabetes unless we lower these values. Thus lower elevated plasma glucose levels below the diabetic range have been clearly shown to be a risk factor for cardiovascular outcomes. Thus lower elevated plasma glucose levels below the diabetic range have been clearly shown to be a risk factor for cardiovascular outcomes. Thus lower elevated plasma glucose levels below the diabetic range have been clearly shown to be a risk factor for cardiovascular outcomes. Thus lower elevated plasma glucose levels below the diabetic range have been clearly shown to be a risk factor for cardiovascular outcomes. Thus lower elevated plasma glucose levels below the diabetic range have been clearly shown to be a risk factor for cardiovascular outcomes. Thus lower elevated plasma glucose levels below the diabetic range have been clearly shown to be a risk factor for cardiovascular outcomes. Thus lower elevated plasma glucose levels below the diabetic range have been clearly shown to be a risk factor for cardiovascular outcomes.
cost effectiveness especially in a resource limited setting like India. One strategy emphasizes a ‘prevalence-based’ approach, because it attempts to find the largest number of individuals with subclinical disease irrespective of their risk for vascular complications. However, the prevalence-based approach may also identify many persons with milder disease who may be less likely to have, or go on to develop, clinically important complications. Thus, a second strategy focuses on finding persons with subclinical Type 2 diabetes who have, or are at higher risk for, those complications. Because their risk is higher, the benefits of finding and treating them may be greater than an approach driven exclusively by disease prevalence.

How Should Individuals Be Tested for Subclinical Type 2 Diabetes

An interesting aspect of testing for subclinical diabetes relative to some other widely endorsed screening strategies is that the existing reference standard test of a 75-g OGGT for diabetes is relatively benign. For example, in the case of early detection for possible colonic neoplasia, the reference standard test is tissue obtained by endoscopic procedures such as colonoscopy etc. These are clearly more invasive procedures than an OGTT and therefore demand that simpler maneuvers such as fecal occult blood testing to be done first. Moreover, because the OGTT is the reference standard for diabetes, it provides, in principle, perfect operating characteristics (100% sensitivity and specificity). One could therefore argue for the OGTT as the screening test of choice. However, this is not feasible because the demands and costs inherent to performing an OGTT in a single individual, although minor, make it an untenable option for screening large numbers of individuals. For this reason, a simpler measure is required, but accepting this strategy also means that one must accept unavoidable losses in sensitivity and specificity relative to that provided by the OGTT. There has been general agreement that screening for diabetes by glycosuria is not a useful alternative because it is too insensitive to detect clinically important hyperglycemia. Random/casual plasma glucose levels are cheap, convenient, and acceptable to patients but have poorer operating characteristics than fasting or postglucose load levels.

Thus options for testing for subclinical Type 2 diabetes include fasting plasma glucose level, 2-hour postload glucose level, or glycosylated hemoglobin (HbA1C) level choosing how to test is best guided by local practice conditions and patient preference. There is strong justification for testing for subclinical Type 2 diabetes in certain high-risk populations like Asian Indians both native and migrant as a routine clinical activity. Subclinical Type 2 diabetes is very common and is associated with complications at the time of diagnosis. Once identified, these persons can receive treatments including tighter glycemic, lipid & blood pressure control. Future Type 1 and Type 2 diabetes can now be reliably predicted in some settings. However, safe, proven ways of preventing both types of diabetes do not exist. Thus, prediction and prevention of diabetes is an experimental activity.

Clinical trials testing preventive therapies for Type 1 and Type 2 diabetes are in progress and should yield information within this decade that can guide clinical practice.

In this issue two premier Chennai centers report results of Subclinical diabetes. Ramchandran’s South Indian cohort is a part of National cohort which shows higher prevalence of IGT in younger age group below age < 40 which is closely associated with BMI. Mohan et al six now famous CUPS cohort links similar high prevalence to family history, life style and obesity (BMI, WHR, WC). Both the elegant Chennai studies and work from Delhi (Misra A) and our group from Mumbai underline a similar common theme. The rising IGT/IFG reflects not only the epidemic in India but its closely links to strong family history, social class and auxology. In fact, positive family history, changing socio-economic class, increasing waist circumference (WC), waist-hip ratio (WHR), weight and BMI are the most crucial drivers to rapidly rising diabetes in India. This group, if picked up early at a ‘subclinical’ stage by simple fasting glucose will lead to better preventive strategy. There is a need to reclassify ‘dysglycemic’ Asian Indian population from the Fasting Plasma Glucose. A classification of Fasting Plasma Glucose (IFG) Grade I: 90 to 100 mg%, Grade II: 101 to 108 mg% and Grade III: 109 to 125 mg% may further amplify the ‘dysglycemic at risk’ Asian Indian. If this IFG with family history, social class and anthropometric parameters (WC, WHR and BMI) are clubbed then the ‘at risk’ Indian can be saved from ravages of vascular endothelial damage. It is time that we identify and aggressively treat subclinical diabetes early to save An Indian from life threatening vascular disease. There is a need to screen for diabetes in high-risk, asymptomatic, undiagnosed adults and children within the health care setting or subclinical in those with pre-diabetes (IFG/IGT) and lifestyle modification should be recommended and be followed by screening at least yearly. It is very necessary to save our children and youth from diabetes by urgently designing life style interventional strategies like “Eat less, Eat on time and Walk more”.

REFERENCES