RESEARCH ARTICLE

DIABETES – A THERAPEUTIC ROADMAP

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ABSTRACT

Diabetes is a condition in which the body does not make enough insulin or the body cells cannot use insulin properly. Insulin is a hormone that helps the body use glucose (sugar) for energy. Without insulin, glucose (the body's main energy source) builds up in the blood, resulting in high blood sugar. There were an estimated 40 million persons with diabetes in India in 2007 and this is no is predicated to rise to 70 million people in 2025.Due to this sheer number economic burden due to diabetes in India is amongst highest in the world. Type 2 diabetes is due to progressive insulin resistance is increase in insulin secretion by pancreatic cell causing hyperinsulinaemia. Insulin resistance is a characteristic feature of most of patients with type 2 diabetes mellitus. The complications of diabetes are preliminary due to high level of blood glucose and also poor glycemic control. Short terms complications happen very quickly and long term complications are comprises of microvascular and macrovascular complications. Prediabetes is most important term and it provides information of those metabolic states that occurs when blood glucose levels are high but remain below level that is established for clinical diagnosis. Prediabetes is the term which includes impaired fasting glucose or impaired glucose intolerance. The therapeutic consequences to treat T1DM and T2DM are proper nutrition, exercise, education and proper pharmacological therapy. In pharmacological therapy many of drugs or medications includes such as Secretagogues, Metformin Thiazolidinediones, alpha glycosidase inhibitor.

INTRODUCTION

Epidemiology of diabetes in India has a long history; Charak Samhita the ancient Indian medical treatise describes this contribution succinctly and suggests that being a obese was a major risk factor. It was recommended that fat asymmetry impairs the strength and shortens lifespan, this may have an indication of increase incidence of diabetes among asymmetrically obsess. Epidemiological studies shows a significant and escalating burden of type 2 diabetes in India. In India prevalence diabetes is high in urban subjects Diabetes is more prevalent in southern rejoin compared to northern and eastern part of country. There is evidence of high burden of impaired glucose tolerance in rural population Diabetes is chronic illness requires continuing medical care and patient self management education to prevent acute complications and to reduce the risk of long term complications.

Diabetes Classification

Type 1 diabetes deficiency	lResult from B-cell destruction, usually leading to absolute insulin
Type 2 diabetes	from progressive insulin secretory defect on the background of insulin resistance
Gastrointestinal diabetes mellitus (GDM)	Diabetes diagnosed during pregnancy
Other specific types Types of diabetes	Due to other causes e.g. Genetic defects in cell functions or in insulin action diseases of exocrine pancreas or drug or chemical induced

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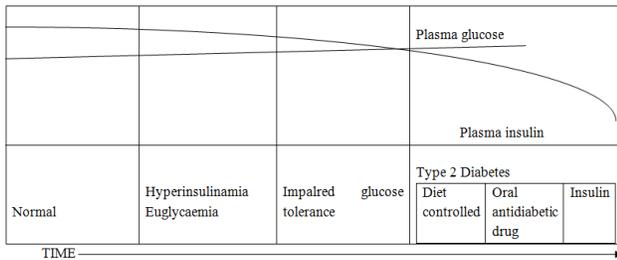
Type 2 Diabetes Mellitus

Accounts for 90% to 95% of all Diabetes Mellitus cases. It is mainly by combination of complex metabolic disorders that results from coexisting defects of multiple organ sites such as insulin resistance in muscle and adipose tissues, progressive decline in pancreatic insulin secretion, unrestrained hepatic glucose production, other hormonal deficiencies. Before the appearance of clinical symptoms, a degree of hypoglycemia may present, can causing pathologic and functional changes in various target tissues. The other risk factors include increasing age and sedentary lifestyle. I t is occur more frequently in women with previous gastrointestinal diabetes and in individuals with hypertension. It is associated with strong genetic predisposition. The type 2 Diabetes is more complex condition than type 1 Diabetes because there is combination of resistance to action of insulin in liver and muscle together with impaired pancreatic Beta cell function leading to "relative" insulin deficiencies.

Natural history of type 2 Diabetes

In early stage of the disorder response to progressive insulin resistance is an increasing in insulin secretion by the pancreatic cell causing hyperinsulinamia. Eventually the beta cells are unable to compensate adequately and blood glucose level raises producing hyperglycemia. With further beta cell failure glycemic control deteriorates and treatment requirements escalate.

- Increased fibrinogen
- Increased plasminogen activator inhibitor-1
- Elevated plasma uric acid
- Increased sympathetic neural activity

Indian diabetic risk score calculation: Do we really need a score for a India

We have 32 million Indians with diabetes and have a largest diabetic pool in world. The problem is further compounded by

Particulars	Score
Age (years)	
< 35	0
35-49	20
> 50	30
Abdominal Obesity	
Waist < 80 cm (female), < 90 (female)	0
Waist > 80-89 cm (female), >90-99 cm (female)	10
Waist >90 cm(female), > 100cm (male)	20
Physical activity	
Exercise (regular) + strenuous work	2
Exercise (regular) or strenuous work	20
No Exercise and sedentary work	30
Family history	
No family history	0
Either parent	10
Both parents	20
Minimum score	0
Maximum score	100

Diabetes: Insulin resistance

Insulin resistance is a characteristic feature of most patients with type 2 diabetes mellitus and is a almost universal finding in type 2 diabetes mellitus obese patients. The concept of syndrome linked to insulin resistance and hyperinsulinamia emerged from the realization that obesity and type 2 diabetes mellitus associated with high prelevance multiple metabolic abnormalities and these disturbances are risk factors for coronary heart disease.

Insulin resistance

Features of insulin resistance syndrome

- Hyperinsulinamia
- Impaired glucose tolerance
- Hypertension
- Low HDL cholesterol; elevated triglycerides
- Central obesity
- Microalbuminurea

the fact that 66% of Indian diabetics are not diagnosed as compared to 50% in Europe and 335 in USA. Therefore a diabetes risk score will helpful to device effective screening strategies to unmask hidden burden of the disease.

Indian Diabetes Risk Score (IDRS)

India requires measurement of Diabetes Risk Score because diabetes risk score will help us to device effective screening strategies to unmask hidden burden of the disease. IDRS may be predictive of metabolic syndrome and cardiovascular disease as three of the factors [age, physical activity and waist circumference] are risk factors for both metabolic syndrome and cardiovascular disease. IDRS uses two modifiable factors (physical activity and waist circumstance) and two non modifiable risk factors (age and family history of diabetes) providing clear message that if modifiable risk factors are altered the score can be considerably reduced.

Diabetes complications: Diabetes is only the metabolic disorder which can affects almost every organ of the body like

eyes, kidney, nerves, brain, limbs etc leading to diabetic complications. The complications of diabetes preliminary due to persistently high level of blood glucose consequent to poor glycemic control. Short terms complications may happens quickly such as hypoglycemia hyperglycemia etc and long term complications comprises of microvascular and macrovascular complications.

Classification of diabetes complications
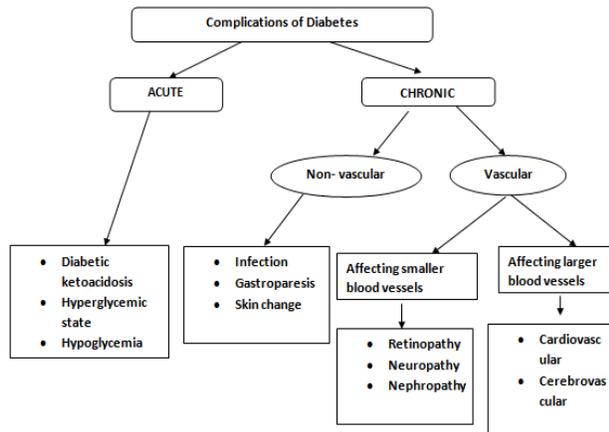
Prediabetes know more about it

Prediabetes is the term that describes those metabolic states that occur when blood glucose level are elevated but remains below the levels that are established for clinical diagnosis of diabetes mellitus. Prediabetes includes states of impaired fasting glucose or impaired glucose tolerance. In the absence of interventions, Prediabetes often progress to T2DM. The 2 hour oral glucose tolerance test is more sensitive for diagnosing prediabetes than fasting plasma glucose test and it is recommended screening method for condition. However because of performing oral glucose tolerance test is not always practical in an ambulatory care setting and fasting plasma glucose test may used to identify patients with impaired fasting glucose. Some patients with glucose intolerance will be misses by the fasting plasma glucose test because is less sensitive than 2 hour oral glucose tolerance test.

It's significant to diagnose and treat the diabetes

Hyperglycemia is mainly related with the consequent development of cardiovascular disease. The patients which are having impaired glucose tolerance associated with increased cardiovascular risk factors. When current glycemic goal is achieved early in progressing of disease Beta cell function is preserved and patient gain residual long term benefits in reducing vascular complications. Result from randomized controlled trials demonstrates the effectiveness of lifestyle intervention in preventing the progression of glucose tolerance to T2DM. The development of T2DM can be prevented by modest weight loss (5% to 7% to total body weight) and regular physical activity (Example 30 min of walking, 5 days a week). Several pharmacological agents effectively reduce progression of glucose tolerance to T2DM and some of these include metformin, acarabose.

Metabolic management of type 2 diabetes

The therapeutic cornerstone to treat T1DM and T2DM are proper nutrition, exercise, education and appropriate pharmacological therapy. Early and aggressive management of glycemia by addressing mean glucose level and glucose level variability is vital to preventing development of diabetic complications.

Pharmacologic Regimens for Treating Type 2 Diabetes Mellitus

Initiate immunotherapy when HbA1c level are 6% to 7%

- Metformin (Bigomet+ Bigomet SR)
- Thiazolidinediones (Piosafe)
- Secretagogues (Glimiprex, Glybovin, Glez)
- Glcosidase inhibitor (Glubose)

Initiate combination therapy when HbA1c level are 7% to 8%

- Secretagogues + Metformin
- Secretagogues + Thiazolidinediones
- Secretagogues + alpha glycosidase inhibitor
- Thiazolidinediones + Metformin
- Secretagogues + Metformin + Thiazolidinediones

Fixes dose (single pills) therapy

- Thiazolidinediones (Piglitazone) + Metformin
- Thiazolidinediones (Piglitazone) + Secretagogues
- Secretagogues (glyburide) + Metformin

Conclusion

Diabetes is a serious disease. The body loses its ability to control the level of sugar in the blood. Patients with diabetes can be taught how to control their diabetes by controlling what they eat, checking their blood sugar several times a day, and exercising. Diabetes mellitus is a metabolic condition affecting multiple organ systems. The oral cavity frequently undergoes changes that are related to the diabetic condition, and oral infections may adversely affect metabolic control of the diabetic state. The mechanisms underlie the oral effects of diabetes share many similarities with the mechanisms that are responsible for the classic diabetic complications. The intimate relationship between oral health and systemic health in individuals with diabetes suggests a need for increased interaction between the dental and medical professionals who are charged with the management of these patients. The current medical treatment regimens and the implications of diabetes care are able to help their diabetic patients achieve and maintain their health in proper way.

REFERENCES

Campos, C. MD. 2007. Treating the whole patient for optimal management of type 2 diabetes consideration for insulin therapy. 8(100). 801-811.

Hussain, A. Asghar, S. 210. Type 2 diabetes and obesity a review. Journal of daibatology.1-9.

Joshi, S. 2005. Indian Diabetes Risk Score. 756-758.

Reaven, MG. 2005. The metabolic syndrome Requiescat in pace Clinical Chemistry. 51-931.

Retnakaran, R. 2013. Short term intensive insulin therapy in Type 2 diabetes mellitus a review. 1-7.

Weaver, L. 2008. Reconsidering the history of type 2 diabetes mellitus in India emerging or reemerging disease in India. The medical journal of India. 6(211). 288-291.

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