

## International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 1, January 2018

# A Review on Diabetes Mellitus Type 2, Its Emergence Is a Major Concern for India

Dr. Agha Parvez Masih<sup>1</sup>, Dr. Syed Sadiq Abbas<sup>2</sup>

Associate Professor, Department of Zoology, Shia PG College, Lucknow, Uttar Pradesh, India<sup>1,2</sup>

**ABSTRACT:** India has a high prevalence of diabetes mellitus and the numbers are increasing at an alarming rate. In India alone, diabetes is expected to increase from 40.6 million in 2006 to 79.4 million by 2030. Studies have shown that the prevalence of diabetes in urban Indian adults is about 12.1%, the onset of which is about a decade earlier than their western counterparts and the prevalence of Type 2 diabetes is 4–6 times higher in urban than in rural areas. The risk factors peculiar for developing diabetes among Indians include high familial aggregation, central obesity, insulin resistance and life style changes due to urbanization. Screening for gestational diabetes and impaired glucose tolerance among pregnant women provides a scope for primary prevention of the disease in mothers as well as in their children. The problems of obesity and impaired glucose tolerance (IGT) (important predisposing factors) are not confined to adults alone but children are also increasingly getting affected. Most long standing macro and micro vascular complications are also more common among Indian diabetics as compared to other races and ethnic groups. A strong familial clustering of diabetic nephropathy among Indian Type 2 diabetics has also been noted. Clustering of cardiovascular risk factor like Syndrome X is common among urban Indians. The rising incidence of diabetes and its complications are going to pose a grave health care burden on our country. Timely effective interventions/measures and screening tests for complications at the time of diagnosis becomes imperative not only for early detection, but also to prevent progression to end stage disease. Screening for gestational diabetes among pregnant women would also go a long way in primary prevention of the disease. Life style changes/interventions and drugs like rosiglitazone are the current strategies that can prevent and/or delay the onset of diabetes. Simple interventional strategies like “Eat less, Eat on time and Walk more” can go a long way in preventing these chronic disorders among present as well as in the future generations.

**KEYWORDS:** Type 2 diabetes, Central obesity, Insulin resistance, Gestational diabetes, Waist hip ratio, Familial aggregation

### I. INTRODUCTION

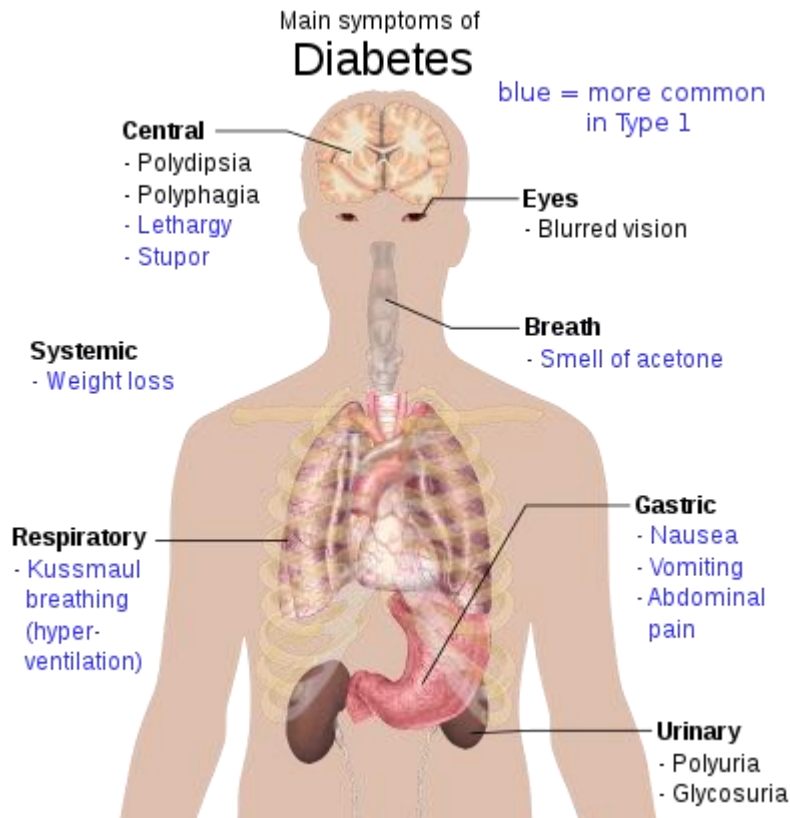
The burden of diabetes is high and increasing globally, and in developing economies like India, mainly fueled by the increasing prevalence of overweight/obesity and unhealthy lifestyles. The estimates in 2019 showed that 77 million individuals had diabetes in India, which is expected to rise to over 134 million by 2045. Approximately 57% of these individuals remain undiagnosed. Type 2 diabetes, which accounts for majority of the cases, can lead to multiorgan complications, broadly divided into microvascular and macrovascular complications.

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 1, January 2018



These complications are a significant cause for increased premature morbidity and mortality among individuals with diabetes, leading to reduced life expectancy and financial and other costs of diabetes leading to profound economic burden on the Indian health care system. The risk for diabetes is largely influenced by ethnicity, age, obesity and physical inactivity, unhealthy diet, and behavioral habits in addition to genetics and family history. Good control of blood sugar, blood pressure and blood lipid levels can prevent and/or delay the onset of diabetes complications. The prevention and management of diabetes and associated complications is a huge challenge in India due to several issues and barriers, including lack of multisectoral approach, surveillance data, awareness regarding diabetes, its risk factors and complications, access to health care settings, access to affordable medicines, etc. Thus, effective health promotion and primary prevention, at both, individual and population levels are the need of the hour to curb the diabetes epidemic and reduce diabetes-related complications in India.

## II. DISCUSSION

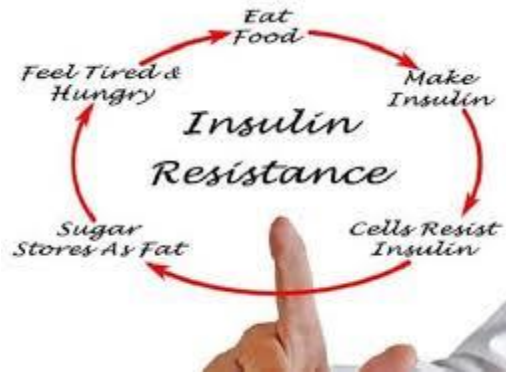
India is one of the epicentres of the global diabetes mellitus pandemic. Rapid socioeconomic development and demographic changes, along with increased susceptibility for Indian individuals, have led to the explosive increase in the prevalence of diabetes mellitus in India over the past four decades. Type 2 diabetes mellitus in Asian Indian people is characterized by a young age of onset and occurrence at low levels of BMI.

## International Journal of Innovative Research in Science, Engineering and Technology

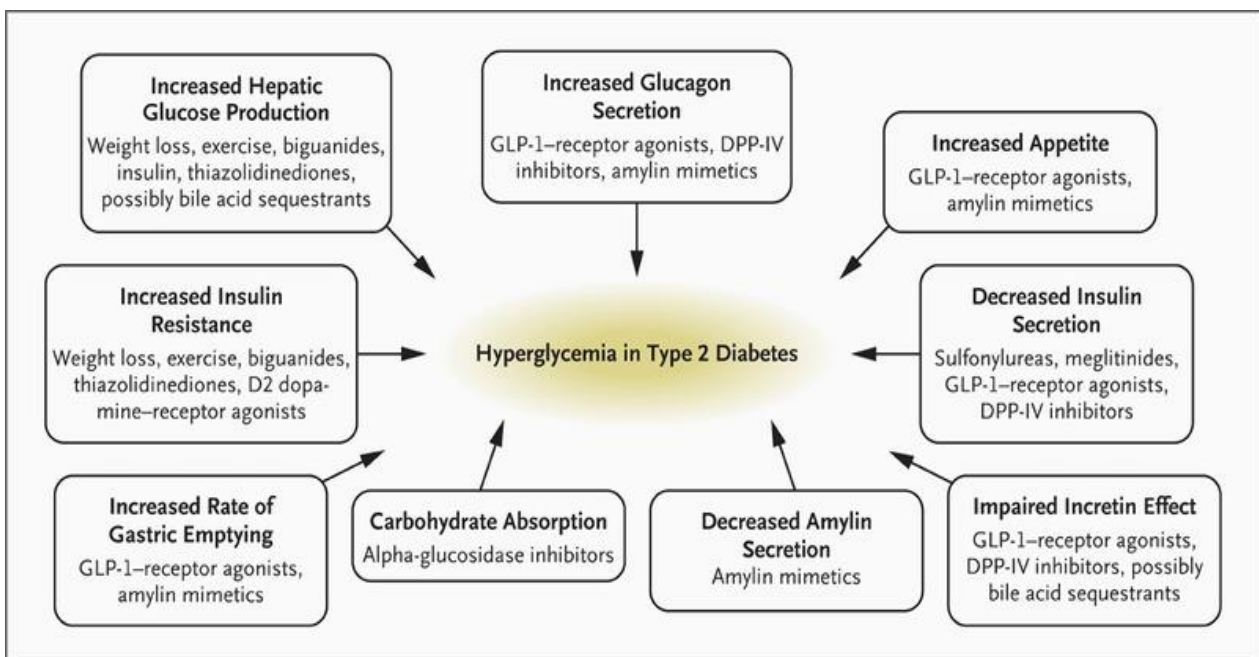
(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 1, January 2018



Available data also suggest that the susceptibility of Asian Indian people to the complications of diabetes mellitus differs from that of white populations. Management of this disease in India faces multiple challenges, such as low levels of awareness, paucity of trained medical and paramedical staff and unaffordability of medications and services. Novel interventions using readily available resources and technology promise to revolutionise the care of patients with diabetes mellitus in India. As many of these challenges are common to most developing countries of the world, the lessons learnt from India's experience with diabetes mellitus are likely to be of immense global relevance. In this Review, we discuss the epidemiology of diabetes mellitus and its complications in India and outline the advances made in the country to ensure adequate care. We make specific references to novel, cost-effective interventions, which might be of relevance to other low-income and middle-income countries of the world. Type 2 diabetes (formerly called non-insulin-dependent, or adult-onset) results from the body's ineffective use of insulin. More than 95% of people with diabetes have type 2 diabetes. This type of diabetes is largely the result of excess body weight and physical inactivity.



# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 1, January 2018

Symptoms may be similar to those of type 1 diabetes but are often less marked. As a result, the disease may be diagnosed several years after onset, after complications have already arisen.

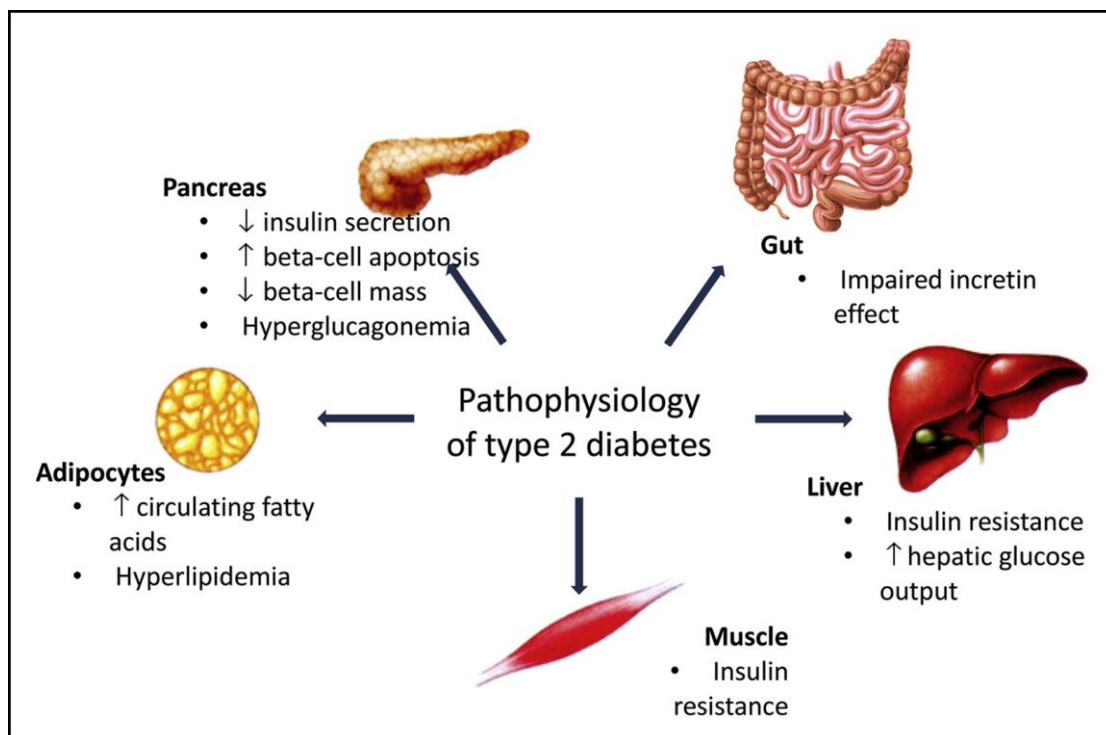
Until recently, this type of diabetes was seen only in adults but it is now also occurring increasingly frequently in children.

Impaired glucose tolerance (IGT) and impaired fasting glycaemia (IFG) are intermediate conditions in the transition between normality and diabetes. People with IGT or IFG are at high risk of progressing to type 2 diabetes, although this is not inevitable.

### III. RESULTS

Over time, diabetes can damage the heart, blood vessels, eyes, kidneys, and nerves.

- Adults with diabetes have a two- to three-fold increased risk of heart attacks and strokes(1).
- Combined with reduced blood flow, neuropathy (nerve damage) in the feet increases the chance of foot ulcers, infection and eventual need for limb amputation.
- Diabetic retinopathy is an important cause of blindness, and occurs as a result of long-term accumulated damage to the small blood vessels in the retina. Close to 1 million people are blind due to diabetes(2).
- Diabetes is among the leading causes of kidney failure(3).



Simple lifestyle measures have been shown to be effective in preventing or delaying the onset of type 2 diabetes. To help prevent type 2 diabetes and its complications, people should:

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 1, January 2018

- achieve and maintain a healthy body weight;
- be physically active – doing at least 30 minutes of regular, moderate-intensity activity on most days. More activity is required for weight control;
- eat a healthy diet, avoiding sugar and saturated fats; and
- avoid tobacco use – smoking increases the risk of diabetes and cardiovascular disease.

## IV. CONCLUSIONS

Early diagnosis can be accomplished through relatively inexpensive testing of blood sugar.

Treatment of diabetes involves diet and physical activity along with lowering of blood glucose and the levels of other known risk factors that damage blood vessels. Tobacco use cessation is also important to avoid complications.

Interventions that are both cost-saving and feasible in low- and middle-income countries include:

- blood glucose control, particularly in type 1 diabetes. People with type 1 diabetes require insulin, people with type 2 diabetes can be treated with oral medication, but may also require insulin;
- blood pressure control; and
- foot care (patient self-care by maintaining foot hygiene; wearing appropriate footwear; seeking professional care for ulcer management; and regular examination of feet by health professionals).



Other cost saving interventions include:

- screening and treatment for retinopathy (which causes blindness);
- blood lipid control (to regulate cholesterol levels);
- screening for early signs of diabetes-related kidney disease and treatment.

## International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 1, January 2018

WHO aims to stimulate and support the adoption of effective measures for the surveillance, prevention and control of diabetes and its complications, particularly in low- and middle-income countries. To this end, WHO:

- provides scientific guidelines for the prevention of major noncommunicable diseases including diabetes;
- develops norms and standards for diabetes diagnosis and care;
- builds awareness on the global epidemic of diabetes, marking World Diabetes Day (14 November); and
- conducts surveillance of diabetes and its risk factors.

<b>Comparison of type 1 and 2 diabetes</b>		
<b>Feature</b>	<b>Type 1 diabetes</b>	<b>Type 2 diabetes</b>
<b>Onset</b>	Sudden	Gradual
<b>Age at onset</b>	Any age (mostly young)	Mostly in adults
<b>Body habitus</b>	Thin or normal	Often obese
<b>Ketoacidosis</b>	Common	Rare
<b>Autoantibodies</b>	Usually present	Absent
<b>Endogenous insulin</b>	Low or absent	Normal, decreased or increased
<b>Concordance in identical twins</b>	50%	90%
<b>Prevalence</b>	Less prevalent	More prevalent - 90 to 95% of U.S. diabetics

The WHO Global report on diabetes provides an overview of the diabetes burden, interventions available to prevent and manage diabetes, and recommendations for governments, individuals, the civil society and the private sector.

The WHO module on diagnosis and management of type 2 diabetes brings together guidance on diagnosis, classification and management of type 2 diabetes in one document. The module is for policy-makers who plan service delivery of diabetes care, national programme managers responsible for training, planning and monitoring service

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 1, January 2018

delivery, and facility managers and primary care staff involved in clinical care and monitoring processes and outcomes of diabetes care.

## REFERENCES

1. Joshi SR, Parikh RM. India - diabetes capital of the world: now heading towards hypertension. *J Assoc Physicians India*. 2007;55:323-4. [PubMed] [Google Scholar]
2. Kumar A, Goel MK, Jain RB, Khanna P, Chaudhary V. India towards diabetes control: Key issues. *Australas Med J*. 2013;6(10):524-31. [PMC free article] [PubMed] [Google Scholar]
3. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes-estimates for the year 2000 *Diabetes Care*. 2004;27(3):1047-53. [PubMed] [Google Scholar]
4. Whiting Dr, Guariguata L, Weil C, Shawj. IDF Diabetes atlas: Global estimates of the prevalence of diabetes for 2011 *Diabetes Res Clin Pract*. 2011;94:311-21. [PubMed] [Google Scholar]
5. Anjana RM, Ali MK, Pradeepa R, Deepa M, Datta M, Unnikrishnan R, Rema M, Mohan V. The need for obtaining accurate nationwide estimates of diabetes prevalence in India - rationale for a national study on diabetes. *Indian J Med Res*. 2011;133:369-80. [PMC free article] [PubMed] [Google Scholar]
6. Zargar AH, Khan AK, Masoodi SR, Laway BA, Wani AI, Bashir MI, Dar FA. Prevalence of type 2 diabetes mellitus and impaired glucose tolerance in the Kashmir Valley of the Indian subcontinent. *Diabetes Res Clin Pract*. 2000;47(2):135-46. [PubMed] [Google Scholar]
7. Ramachandran A, Snehalatha C, Kapur A, Vijay V, Mohan V, Das AK, Rao PV, Yajnik CS, Prasanna Kumar KM, Nair JD. Diabetes Epidemiology Study Group in India (DESI). High prevalence of diabetes and impaired glucose tolerance in India: National Urban Diabetes Survey. *Diabetologia*. 2001;44(9):1094-101. [PubMed] [Google Scholar]
8. Arora V, Malik JS, Khanna P, Goyal N, Kumar N, Singh M. Prevalence of diabetes in urban Haryana. *Australas Med J*. 2010;3(8):488-94. [Google Scholar]
9. Bramley D, Hebert P, Jackson R, Chassin M. Indigenous disparities in disease-specific mortality, a cross-country comparison: New Zealand, Australia, Canada, and the United States. *N Z Med J*. 2004;117(1207):U1215. [PubMed] [Google Scholar]
10. Sukala WR, Page RA, Rowlands DS, Lys I, Krebs JD, Leikis MJ, Cheema BS. Exercise intervention in New Zealand Polynesian peoples with type 2 diabetes: Cultural considerations and clinical trial recommendations. *Australas Med J*. 2012;5(8):429-35. [PMC free article] [PubMed] [Google Scholar]
11. Khalil H, George J. Diabetes management in Australian rural aged care facilities: A cross-sectional audit. *Australas Med J*. 2012;5(11):575-80. [PMC free article] [PubMed] [Google Scholar]