



## REVIEW ARTICLE

### TRENDS IN PREVALENCE OF DIABETES IN INDIA AND ITS ASSOCIATED FACTORS

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#### ABSTRACT

Diabetes is one of the most common chronic disease in the present world. Socio-economic growth and industrialization are rapidly occurring in India, the urban-rural divide in prevalence is narrowing as urbanization is spreading widely, adversely affecting the lifestyle of populations. Indians have a greater ethnic and genetic predisposition to diabetes so the younger people are also affected with diabetes. The burden of the disease is increasing and it is a costly disease for developing countries. A study by diabetic research and clinical practice 2010, by 2030 there will be nearly 87 million diabetics in India. This is a serious condition. This article explains the role of glucose in the body, entry of glucose, role of insulin and the increasing prevalence of diabetes in India.

#### INTRODUCTION

Diabetes mellitus refers to a group of metabolic disorders characterized by chronic hyperglycemia resulting from defects in insulin secretion, insulin action or both. We obtain glucose from the food that we eat; anything we eat is finally converted to glucose for the release of energy. Starch a polysaccharide is also broken down by digestive enzymes into individual glucose molecules. This glucose is a energy rich monosaccharide that is broken down by our cells to produce adenosine triphosphate (ATP). These ATP's powers all the biochemical reactions taking place in the body. The food we eat travels through the digestive tract and enters the small intestine, where glucose is absorbed into the blood, travels to all the tissues of the body to give energy and finally travels to the liver for any extra glucose present to be converted into glycogen for future use.

##### Entry of glucose into the cells

Entry of glucose into the cell is mediated by a hormone called insulin produced by the pancreas, a gland present under the stomach which plays a major role in glucose regulation. Pancreas also produces digestive enzymes which aid in digestion. To enter cells, glucose requires trans-membrane transporters and there is a family of these called GLUT (Glucose Transporter). The most numerous is GLUT4, which is found on muscle and fat cells. When insulin binds to insulin receptors on the cell membrane, cells are stimulated to increase the number of glucose transporters.

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The more transporters are produced, the more glucose is transported into cells – with a corresponding drop in blood glucose. Insulin clears glucose from the blood in two ways; it prevents the liver from releasing additional glucose and it causes muscles and fat cells to absorb more of sugar. These muscle cells convert glucose into glycogen, which can be reconverted when needed. Fat cells convert glucose into adipose tissue for long term storage. When this process is followed blood glucose is normal, whereas when there is too little insulin, insulin resistance or when muscle or fat cell resist its effect it creates a condition called hyperglycemia or high blood glucose. And when this condition becomes chronic it is termed as diabetes mellitus. Not all tissues require insulin to take up glucose, for example brain and liver cells use GLUT transporters that are not dependent on insulin.

##### Major complications of diabetes

##### Acute complications

- Hypoglycemia or low blood sugar: this is mainly due to poor meal timings. reducing food intake, skipping meals or delaying snack, the level of sugar falls in the blood.
- Hyperglycemia: this condition arise when there is not enough insulin to meet the bodies need.

##### Chronic complications

- Atherosclerosis
- Retinopathy
- Nephropathy
- Neuropathy

- Infections

### Changes in prevalence of type 2 diabetes in India

In the last 50 years the prevalence of diabetes has increased remarkably. The earliest study was done in Calcutta (now Kolkata) in 1938 and then in Bombay 1959. Looking in the prevalence of last few years, a study conducted by Chow CK, Raju PK et.al the prevalence and management of diabetes in rural India, (Andhra Pradesh) prevalence was 13.2% (Chow, 2006). Another study was conducted by Ahmad J, Masood MA et.al in 2011, where the prevalence was 6.05% (Ahmad, 2011). In a study by Gupta M, Prabhu K et.al in south India the overall prevalence of diabetes was 12.15 and pre diabetes 14%. Another study by Singh K, Kumar S et.al was conducted in 2015, in Jammu. Out of 4000 subjects screened 194 were found to be diabetic i.e. the prevalence was 4.85% (Singh, 2015). Another study conducted by ICMR published in 2011. This was a nation wide study. The representative samples were drawn from four geographical regions, Chandigarh, Tamil Nadu, Jharkhand and Maharashtra. Prevalence of diabetes was 14.2%, 13.7%, 13.5% and 10.9% respectively in urban area and 8.3%, 7.8%, 3% and 6.5% in rural areas. We find a wide range in the prevalence in urban and rural areas which may be due to a large number of underlying variables (Anjana, 2011). National family health survey report published in 2017 showed a prevalence of 5.8% in women and 8% in men (blood glucose > 140mg/dl) (National Family Health Survey, 2017). In a recent study 2017 in Aurangabad district, by Naval S, Mahajan S et.al an overall prevalence was 11.2% and pre diabetes 6.6% (Naval et al., 2017). In another study was conducted by Tripathy JP, Thakur JS et.al in Punjab published in 2017. In this study the overall prevalence of DM was 8.3% and pre diabetes was found to be 6.3% (Tripathy, 2017). In another study conducted by Naaz S and Dhillon, Prevalence of diagnosed diabetes and associated risk factors: evidence from the large scale surveys in India, published in 2017. This study showed a prevalence of 7% (Naazb, 2017). We can find from the above studies that the prevalence is gradually increasing over time, also the rise is much faster in the urban population than the rural ones.

### Risk Factors of Diabetes

- **Genetic:** altered frequency of certain human lymphocyte antigen on chromosomes 6, abnormal immune response, autoimmunity and islet cell antibodies tend to develop type 1 diabetes.

- **Age:** in Indians the disease can occur in younger age too.
- **Sex:** younger males are more prone but females are affected in greater numbers.
- **Infections:** some viral infections like measles, mumps can trigger abnormal auto immune response that destroy the beta cells of pancreas resulting in lesser insulin production and diabetes.
- **Increased catabolism:** excess breakdown of liver glycogen, tissue protein and fat breakdown can cause in changes in metabolism resulting in diabetes.
- **Dietary factors:** excess refined foods, low intake of fibre in the diet or excess energy intake over a long period may cause energy imbalance. This may lead to obesity a risk factor for diabetes.

### REFERENCES

- Ahmad J, Masodi MA *et al.* 2011. prevalence of Diabetes Mellitus and its associated risk factors in age group of 20 years and above in Kashmir, India. *Al Ameen J Ned Sci.*, 4(1): 38-44
- Anjana RM, Pradeepa R *et al.* 2011. Prevalance of diabetes and pre diabetes in urban and rural India: phase I results of Indian Council of Medical Research- India Diabetes(ICMR-INDIAB) study. *Diabetologia.*, 54:3022-7
- Chow CK, Raju PK *et al.* 2006. The prevalence and management of diabetes in rural India. *Diabetes care.*, 29:1717-18
- Naaz S and Dhillon, 2017. Prevalence of diagnosed diabetes and associated risk factors: evidence from the large scale surveys in India, published in 5,28-36
- National Family Health Survey -4: International Institute for Population Sciences,2017;6
- Naval SS, Mahajan SM *et al.* 2017. Prevalance of type 2 diabetes mellitus and its associated sociodemographic risk factors found in nachanwel and Pishor revenue circle of Aurangabad district. *International journal of community medicine and public health.*, jul4(7):2312-2319
- Singh K, Kumar S. 2015. Prevalance of diabetes mellitus in rural population of Jammu. *JK Science*, 17:2
- Tripathy Jp, Thakur JS *et al.* 2017. Prevalance and risk factors of diabetes in a large community- based study in North India: results from a STEPS survey in Punjab, India. *Diabetology and metabolic syndrome*;9:8

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