

KEYWORDS

- Lifestyle
- Type 2 Diabetes (T2D)
- Genomics
- Stem cells
- Drug Discovery
- Treatment

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Type 2 Diabetes (T2D) - The rising tsunami tide in India

I hope everyone knows about tsunami but, not many of us know about its origin and journey of destruction. Pressure differences inside of the earth, eventually lead to volcanic eruptions or earth quakes that leads to generation of tsunamis and the damage it causes is irreversible. I feel the same with T2D since we do not know when it starts and how does it manifests into diabetic phenotype. Modern science is struggling hard to make T2D reversible with the help of stem cells. Very soon India is going to be the diabetic capital of the world and so I honour T2D as “The rising tsunami tide in India”. In the October 2018 newsletter, we have given a glimpse of the Lifestyle diseases highlighting T2D as one of them. This issue will extrapolate T2D as a case study addressing few rarely asked questions.

People with type 2 diabetes are increasing worldwide, but more than 80% are prevalent in developing countries such as India, Bangladesh, Bhutan, Pakistan, Sri Lanka, Philippines and Indonesia. Among the top 10 countries in the world, India stands second with 69.2 million people with diabetes and another 36.5 million with prediabetes which is a high-risk condition for diabetes and cardio-vascular disease. This increasing incidence is mainly attributed to lifestyle changes; eating unhealthy food and being physically inactive.



Fig 1. Prevalence of diabetes world-wide. Pic courtesy: <http://www.diabetesatlas.org/>

What are the genes influenced by Diabetes?

The chronic hyperglycaemia of diabetes is associated with long-term damage, dysfunction and failure of different organs, especially the eyes, kidneys, nerves, heart and blood vessels. Diabetes is currently the fastest-growing epidemic caused due to complex interplay between genetic and environmental factors. The activity of genes is influenced by environmental factors/our lifestyle. The figure below explains the complexity of genes involved in T2D.

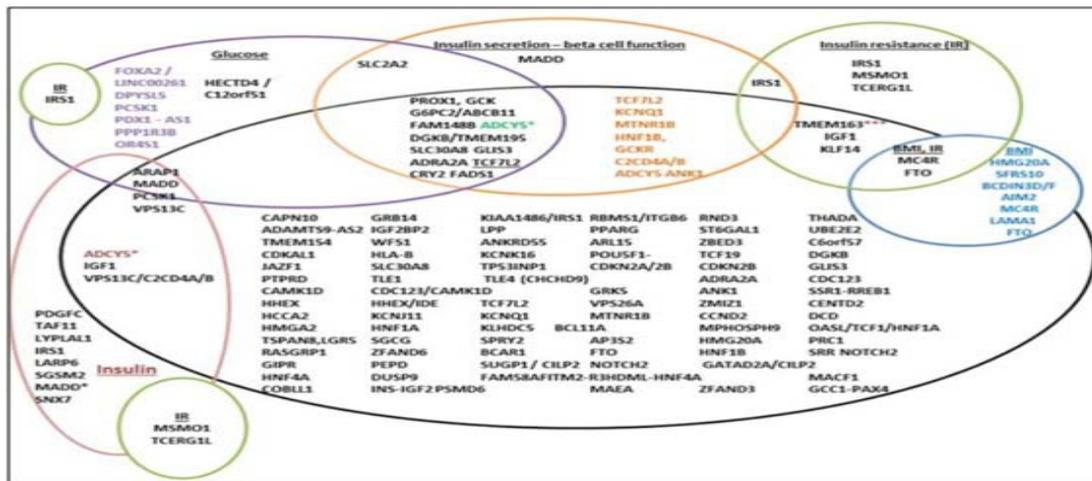


Fig. T2D associated genes. Pic courtesy: Genes (Basel). 2015 Mar; 6(1): 87–123.

How do they manifest into disease?

T2D, hypertension and cardiovascular diseases are interconnected and it is difficult to find the starting point especially for T2D. Excessive environmental/lifestyle pressure on certain set of initiating genes, makes them express abnormally in the body in turn triggering other sets of genes to eventually damage the metabolism and manifest into disease symptoms.

Are there any databases with genuine information on T2D?

Yes. International Diabetes Federation (IDF) is the standalone web portal with all the comprehensive information on diabetes related to every country. This works in coordination with World Health Organization (WHO).

<http://www.diabetesatlas.org/>

<https://www.who.int/news-room/fact-sheets/detail/diabetes>

Other important link to get India's specific information is

<https://reports.instantatlas.com/report/view/704ee0e6475b4af885051bec15f0e2c/IND>

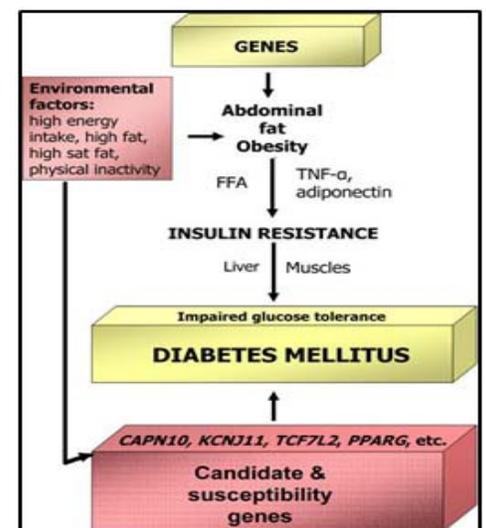


Fig. 3: Interrelation between genes and environmental factors in type 2 diabetes

Can genomic profiling and stem cells therapy help in T2D treatment?

Yes. Genomic profiling helps in understanding the diagnosis in full depth. Stem cell therapy is on the way to take over modern medicine in T2D treatment and this will be possible only after careful genomic study of donor stem cells and patient's pancreatic cells.

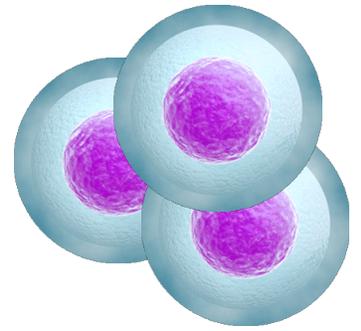
What is the status of drug discovery?

There are around 10 top ranked diabetic drugs that are used for major symptoms of diabetes. There are around 50 derived drugs used independently or in combination with others based on the symptoms. But world class clinical and research experts suggest that prevention is better than cure. Diabetes can be treated and its consequences can be avoided or delayed with balanced diet, physical activity, meditation & regular check-ups and treatment for complications. However, research is underway to produce exclusively oral drugs to avoid current practice of injections.

CRITICAL NOTE: Healthy diet, regular physical activity, maintaining a normal body weight and avoiding tobacco use are ways to prevent or delay the onset of type 2 diabetes.

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