



Diabetes and its Prevalence in the Indian Population

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i64B35329

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/80088>

Review Article

Received 03 November 2021

Accepted 29 December 2021

Published 30 December 2021

ABSTRACT

Background: India is one of the world's epicenters of the diabetes pandemic. The increased sensitivity of Indians has resulted in a massive increase in diabetes mellitus prevalence in India. Diabetes mellitus type 2 is significantly more frequent than diabetes mellitus type 1. In India, most of those affected are affluent and educated urbanites rather than uneducated or underprivileged rural dwellers. The change in lifestyle choices, urbanization, and various other factors have led to this.

Conclusion: The mushrooming weight of diabetes is an actual threat in India. The health system has conventionally been designed to cater to acute illness and maternal and child health apprehensions in India. This emphasizes the need for a multi-protracted strategy to minimize the burden of diabetes and its complications. Main gaps exist in laborers to comprehend the load nationally and globally, specifically in developing nations, due to an absence of accurate data for monitoring and observation.

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Keywords: Diabetes; diabetes management; non-communicable diseases; health care; India; awareness; causes leading to diabetes; central obesity; types of diabetes.

1. INTRODUCTION

Diabetes is a chronic non-communicable condition that causes high blood glucose levels. Type 1 diabetes mellitus, type 2 diabetes mellitus, maturity-onset diabetes of the young (MODY), gestational diabetes, neonatal diabetes, and secondary causes owing to endocrinopathies, steroid use, and so on are the many forms of diabetes mellitus. Their exactitude is [1-3]. Their exact definitions are as follows.

- *Type 1 diabetes (T1D), often known as juvenile diabetes, is a type of diabetes that affects children and adolescents. It is an autoimmune disease that is a kind of diabetes in which the islets of Langerhans (which contain beta cells) in the pancreas generate very little or no insulin [4,5].*
- *Type 2 diabetes (T2D) is often known as adult-onset diabetes. It is a kind of diabetes marked by high blood sugar, insulin resistance, and a lack of insulin primarily caused by lifestyle choices [6-8].*
- *Maturity onset diabetes of the young (MODY) is a kind of diabetes mellitus caused by mutations in an autosomal dominant gene that causes insulin production to be disrupted. MODY is also known as monogenic diabetes [9-15].*
- *Gestational diabetes - When a woman who does not have diabetes gets high blood sugar levels during pregnancy [11].*
- *Neonatal diabetes mellitus (NDM) - A illness that affects the ability of an infant's body to make and use insulin. It is a type of diabetes that develops in the first six months of life and is caused by a single gene [12].*
- Diabetes mellitus caused by endocrine problems has also been reported.
- Steroid-induced diabetes mellitus is defined as an abnormal rise in blood glucose in a patient with or without a history of diabetes mellitus caused by the use of glucocorticoids [13].

Indians have a unique phenotype characterized by substantial intra-abdominal fat and insulin resistance despite having a low BMI, predisposing them to Type 2 Diabetes Mellitus and early coronary heart disease. Type 1

diabetes (T1D) is an autoimmune illness with multiple causes. Susceptibility to T1D is highly connected to the significant genetic locus, the major histocompatibility complex, and several other minor loci, such as insulin, are responsible for diabetes risk in an epistatic way [14-16]. India is the archetypal undeveloped country that has undergone a major socioeconomic and demographic transformation in recent decades and is currently classified as a developing country. The main reasons for the crisis are rapid socioeconomic development due to urbanization and industrialization, which are the main reasons for the global diabetes epidemic. The diabetes epidemic is spreading, with diabetes incidence shifting from urban to rural areas, from the wealthy to the less fortunate, and older to younger people. Diabetes is a chronic disease that causes various problems, classified as a small vessel or microvascular disease or large vessel or macrovascular disease [17-20].

The microvascular complications are as follows –

1. Diabetic retinopathy is a condition that affects the inner part of the eye, the retina.
2. Diabetic nephropathy is a condition that affects the kidneys.
3. Diabetic neuropathy is the term for damage to the peripheral nerves.

The macrovascular complications are as follows–

1. Cardiovascular disease is a word used to describe a condition that affects the heart.
2. Cerebrovascular disease is a condition that affects the brain.
3. Peripheral vascular disease is a phrase used to describe the disease of the peripheral arteries.

1.1 Aim

To study the prevalence of diabetes and the factors that effectuate it.

1.2 Objective

This review aims to study diabetes, its prevalence in the Indian population, and the factors responsible for the explosive increase in India.

2. METHODOLOGY

2.1 Search Strategy

A search was performed on PubMed using the terms: 'Indian population' OR 'Indian youth' AND 'Diabetes prevalence' OR 'Early onset of diabetes' OR 'Type 1 diabetes Mellitus OR 'Type 2 Diabetes Mellitus [MeSH Terms], a total of 164,942 articles were identified and using 'Diabetes a common disease in Indians', a total of 142 articles were identified. Few articles were included in the final review from PubMed.

Search on Google Scholar using 'Diabetes in India' was perpetrated. Upon further reviewing and reading, excluding articles inept and irrelevant to type 1 diabetes mellitus or type 2 diabetes mellitus or prevalence of diabetes in Indians, a few articles were included in the final review from Google Scholar.

Statistical data was included from the IDF DIABETES ATLAS Ninth edition 2019 by International Diabetes Federation.

Source of definitions – Wikipedia.

2.2 Figures and Facts

- According to the International Diabetes Association (IDA), approximately 463 million adults (20-79 years) worldwide have diabetes [20-22].
- Adults with diabetes made for 79 percent of the population in low- and middle-income nations.
- Diabetes will affect 111 million people over 65 in the United States in 2019. Diabetes is expected to affect one out of every five persons in this age range.
- China has seen the most significant increase in people with diabetes, followed by India.

On January 8, 2008, the Ministry of Health and Family Welfare of the Government of India announced the National Programme on Prevention and Control of Diabetes, Cardiovascular Diseases, and Stroke (NPDCS) to combat the rising burden of non-communicable diseases. Its goals include non-communicable disease prevention and control, lifestyle change awareness, early diagnosis of non-communicable diseases, and health system capacity building to combat non-communicable diseases [23].

NGOs and private practitioners and Urban Social Health Activists (USHA) or other available health workers were to be included in delivering effective diabetes promotion, prevention, and control methods for urban settings [24].

Diabetes was less common in the low socioeconomic group living in cities than the high socioeconomic group (12.6 percent vs. 24.6 percent in subjects >40 years).

There are diabetes incidence trends in India related to the geographical distribution of diabetes. According to preliminary findings from a significant community study performed by the Indian Council of Medical Research (ICMR), Northern Indian states (Chandigarh 0.12 million, Jharkhand 0.96 million) have a smaller population proportion affected than Maharashtra.

3. OBSERVATION

In grown-ups, diabetes, hypertension, and coronary disease prevalence are more significant in the city population than in rural populations, related to different insulin resistance in city groups. Awareness and understanding of the disease are not pleasing amongst patients, resulting in late recognition of problems. The charge of treatment, the necessity for lifelong medication, and inadequate availability of anti-diabetic medications within the community sector and cost are vital issues for treatment obedience. Insufficient knowledge, focus on acute administration rather than precautionary healthcare, competing care needs and delay in clinical retort to poor control are doctor-related issues in diabetes regulation in India. Characteristics related to the food and the quality of nutrition depend on the availability of affordable food and accessibility to it. The amount of physical activity or sedentary lifestyle plays a significant role. Overweightness or obesity is a significant risk aspect for diabetes. An increase in lifestyle standards and the obtainability of calorie-rich food, fatty food, and fast food at a cheap rate is one of the many reasons behind diabetes mellitus. Alcohol intake in excessive amounts damages the pancreas and also leads to obesity. Not one, but many people are suffering from diabetes mellitus in India, but the lack of awareness about the same remains a prevalent issue. The risk factors peculiar for evolving diabetes mellitus among Indians include high familial aggregation.

4. DISCUSSION

In India, various administrative and non-administrative organizations provide health care. There are district clinics, tertiary healthcare sickbays, and medical colleges in rural areas, and in towns, there are district clinics, primary healthcare centers, and public healthcare centers. The cost of diabetes can be decreased if universal healthcare is made available—early detection and treatment of the illness and access to affordable treatments [25-27]. Individual diabetes operational management is only a part of the solution to the diabetic problem. Other aspects of healthcare that are crucial for diabetes management may be challenging to deliver within the healthcare setup. Residents-based approaches to healthcare advancement risk reduction, and surveillance of disease trends and risk factors are all crucial elements of any public diabetes management strategy. Issues such as service accessibility are also a significant aspect of India. A considerable portion of the population lacks technical knowledge, making it challenging to provide better care. Nonpharmacological therapies, on the other hand, necessitate long-term adherence and are thus critical. Healthcare workers may be able to educate patients here. In healthcare contexts, patient knowledge and empowerment, together with attempts to standardize administration and control methods, are crucial for ensuring good running and control [28-30]. Continuing education programs for general practitioners could provide the medical force needed to commit to the program [31]. Service quality, healthcare quality, and the overall grade of diabetes care are all changeable and can be improved.

5. CONCLUSION

The mushrooming weight of diabetes is an actual threat in India. The health system has conventionally been designed to cater to acute illness and maternal and child health apprehensions in India. This emphasizes the need for a multi-protracted strategy to minimize the burden of diabetes and its complications. Main gaps exist in laborers to comprehend the load nationally and globally, specifically in developing nations, due to an absence of accurate data for monitoring and observation. Current estimates are inexact, only providing a rough image and probably underestimating the disease load. The current methodologies used are insufficient for providing a complete and accurate valuation of the

prevalence of diabetes mellitus. More information about insulin secretion, action, and the genetic variability of the different factors involved will lead to a healthier understanding and classification of this group of diseases. To reduce indisposition and death due to diabetes, rigorous efforts of consultants involved in diabetes care, family physicians, patients with diabetes, functional associations, overall population, and those delegated with public health in India are necessary. Immediate steps are required to advance total exercise levels in India by addressing blocks and enhancing the quality of exercise executed to boost overall metabolic health. Simple intervention strategies can work an extensive way in averting and sustaining diabetes.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:

The peer review history for this paper can be accessed here:
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