

REVIEW

Diabetes Care in India



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Abstract

BACKGROUND Diabetes has become a major health care problem in India with an estimated 66.8 million people suffering from the condition, representing the largest number of any country in the world.

OBJECTIVE The rising burden of diabetes has greatly affected the health care sector and economy in India. The goal of health care experts in India is to transform India into a diabetes care capital in the world.

METHODS An expert detailed review of the medical literature with an Asian Indian context was performed.

FINDINGS Recent epidemiologic studies from India point to a great burden from diabetes. Diabetes control in India is far from ideal with a mean hemoglobin A1c of 9.0%—at least 2.0% higher than suggested by international bodies. Nearly half of people with diabetes remain undetected, accounting for complications at the time of diagnosis. Screening can differentiate an asymptomatic individual at high risk from one at low risk for diabetes. Despite the large number of people with diabetes in India, awareness is low and needs to be addressed. Other challenges include balancing the need for glycemic control with risk reduction due to overly tight control, especially in high-risk groups and taking into account health care professional expertise, attitudes, and perceptions. Pharmacologic care should be individualized with early consideration of combination therapy. Regular exercise, yoga, mindful eating, and stress management form a cornerstone in the management of diabetes.

CONCLUSIONS Considering the high cost incurred at various steps of screening, diagnosis, monitoring, and management, it is important to realize the cost-effective measures of diabetes care that are necessary to implement. Result-oriented organized programs involving patient education, as well as updating the medical fraternity on various developments in the management of diabetes, are required to combat the current diabetes epidemic in India.

KEY WORDS diabetes, diabetes care, India, obesity, prevention, screening, thin-fat Indian, type 1, type 2

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INTRODUCTION

India lies to the north of the equator between 6° 44' and 35° 30' north latitude and 68° 7' and 97° 25'

east longitude. India's coastline measures 7517 km in length; of this distance, 5423 km belong to peninsular India and 2094 km to the Andaman, Nicobar, and Lakshadweep island chains. The Indian

climate is strongly influenced by the Himalayas and the Thar Desert. Four major climatic groupings are predominant in India: tropical wet, tropical dry, subtropical humid, and montane. Rapidly changing socioeconomic demographics have changed the global landscape of diabetes. Geographically, the prevalence of diabetes has been studied by many expert groups. The extreme locations contribute to variance in the diabetes prevalence rates, not only across the longitude and latitude, but also across rural and urban areas of the country.

EPIDEMIOLOGY

According to the International Diabetes Federation (IDF), there were an estimated 387 million individuals with diabetes worldwide in 2014, and this number is set to increase to 592 million by the 2035.¹

Despite the large number of people with diabetes in southeast Asia, health care spending on the disease was estimated to be only US\$6 billion, accounting for <1% of the global total, with India estimated to have spent the largest proportion. Adults in India alone account for 86% of this region's adult population of 883 million. India is experiencing an economic growth rate second only to China.¹ The projected increase in regional diabetes prevalence to 10.1% in 2035 is a consequence of ongoing large-scale urbanization and increasing life expectancy (in India, the proportion of the population age > 50 years is expected to increase from 27% to 35% between 2013 and 2035).¹ In 2013, an estimated 12,600 children age < 15 in the region developed type 1 diabetes (T1D).¹ India accounts for the majority of children with T1D, which has important consequences not only for the total region but also for worldwide estimates.¹ With 1.2 million deaths (14.2% of all adult deaths) in 2013, this region has the second highest number of deaths attributable to diabetes of any of the 7 IDF global regions (Africa, Europe, Middle East and North Africa, North America and Caribbean, South and Central America, Southeast Asia, and Western Pacific).¹ More than half (55%) of these deaths occurred in individuals age < 60 years and 27% in people < 50 years of age.¹ Increased mortality related to diabetes in India is related to poor overall health care, with 59.11% dying within 1 week of hospitalization with infection and chronic renal failure being the major causes of death, compared with cardio- and cerebrovascular disease in the West.² The pooled prevalence of rural diabetes among

low- and middle-income countries has been estimated at 5.6% over a 25-year period.¹

THIN-FAT INDIAN CONCEPT

Asian Indians have a small body size, which has been termed *thin-fat Indian*. Asian Indians have thinner limbs, which is suggestive of smaller muscle mass. However, despite their thinness, they are centrally obese, with a higher waist-to-hip ratio (WHR) and higher subscapular-to-triceps skinfold ratio than their British counterparts. Many studies show that Asian Indians have more body fat for any given body mass index (BMI) compared with whites and black Africans.³ Asian Indians also have higher levels of central obesity (measured as waist circumference [WC], WHR, visceral fat, and posterior subcutaneous abdominal fat).⁴ This is reflected in higher plasma nonesterified fatty acid (NEFA) and triacylglycerol (TG) concentrations, hyperinsulinemia with fasting as well as post-glucose challenge states, and higher insulin resistance (IR).⁴ Thus, Asian Indians have an unusual thin-fat body composition associated with the IR syndrome.⁵ In a 2007–2012 survey analysis, the prevalence of sarcopenia (low skeletal muscle mass) in India was 17.5% and sarcopenic obesity (high percent body fat with low skeletal muscle mass) 1.3%.⁶ Mohan et al.⁷ advanced the concept of the “Asian Indian phenotype”: IR, increased abdominal obesity (higher WC despite lower BMI), lower adiponectin, and higher C-reactive protein levels.

DIABETES BURDEN IN INDIA: MEDICAL, SOCIAL, AND ECONOMIC

The diabetes burden in India results from various factors. Genetic predisposition combined with lifestyle changes and associated with urbanization and globalization, all together contribute to the rapid rise of diabetes in India. Ethnicity plays a role as well, and in one example, there are lower thresholds for the effect of BMI on age-adjusted type 2 diabetes (T2D) prevalence rates among Indians.⁸ Moreover, T2D in the Indian population appears to occur at least a decade earlier than in Europeans.⁷ Due to these sheer numbers, the economic burden due to diabetes in India is among the highest in the world. However, the real burden of diabetes is due to its micro- and macrovascular complications, which lead to increased morbidity and mortality.¹ It is also known that almost 50% of people with

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