PECULARITIES OF EPIDEMIOLOGY AND ETIOLOGY DIABETES MELLITUS IN INDIA

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Diabetes is fast gaining the status of a potential epidemic in India with more than 62 million diabetic individuals currently diagnosed with the disease. In 2000, India (31.7 million) topped the world with the highest number of people with diabetes mellitus followed by China (20.8 million) with the United States (17.7 million) in second and third place respectively. According to Wild et al. the prevalence of diabetes is predicted to double globally from 171 million in 2000 to 366 million in 2030 with a maximum increase in India. It is predicted that by 2030 diabetes mellitus may afflict up to 79.4 million individuals in India, while China (42.3 million) and the United States (30.3 million) will also see significant increases in those affected by the disease. India currently faces an uncertain future in relation to the potential burden that diabetes may impose upon the country.

Many influences affect the prevalence of disease throughout a country, and identification of those factors is necessary to facilitate change when facing health challenges. So what are the factors currently affecting diabetes in India that are making this problem so extreme?

The etiology of diabetes in India is multifactorial and includes genetic factors coupled with environmental influences such as obesity associated with rising living standards, steady urban migration, and lifestyle changes. Yet despite the incidence of diabetes within India, there are no nationwide and few multi-centric studies conducted on the prevalence of diabetes and its complications. The studies that have been undertaken are also prone to potential error as the heterogeneity of the Indian population with respect to culture, ethnicity, socio- economic conditions, mean that the extrapolation of regional results may give inaccurate estimates for the whole country.

There are, however, patterns of diabetes incidence that are related to the geographical distribution of diabetes in India. Rough estimates show that the prevalence of diabetes in rural populations is one-quarter that of urban population for India and other Indian sub-continent countries such as Bangladesh, Nepal, Bhutan, and Sri Lanka. Preliminary results from a large community study conducted by the Indian Council of Medical research (ICMR) revealed that a lower proportion of the population is affected in states of Northern India (Chandigarh 0.12 million, Jharkhand 0.96 million) as compared to Maharashtra (9.2 million) and Tamil Nadu (4.8 million). The National Urban Survey conducted across the metropolitan cities of India reported similar trend: 11.7 % in Kolkata (Eastern India), 6.1 % in Kashmir Valley (Northern India), 11.6 % in New Delhi (Northern India), and 9.3 % in West India (Mumbai) compared with (13.5 % in Chennai (South India), 16.6 % in Hyderabad (south India), and 12.4 % Bangalore (South India). A suggested explanation for this difference is that the north Indians are migrant Asian populations and south Indians are the host populations, however this

possible cause-and-effect has not been corroborated through further research. Similar ethnographic disparities have been observed in indigenous and non-indigenous populations in countries colonised by the Great Britain: indigenous people from New Zealand and Australia have been shown to suffer from diabetes and cardio-metabolic disorders more than the non-indigenous people. Further studies are required in India to highlight cultural and ethnic trends and provide a more complete understanding of the differences in diabetes aetiology between Indian and other ethnic groups within India.

Although the Indian urban population has access to reliable screening methods and anti-diabetic-medications, such health benefits are not often available to the rural patients. There is a disproportionate allocation of health resources between urban and rural areas, and in addition poverty in rural areas may be multi-faceted. Food insecurity, illiteracy, poor sanitation, and dominance of communicable diseases may all contribute, which suggests that both policy makers and local governments may be undermining and under-prioritising the looming threat of diabetes. Such inadequacies contribute to an infrastructure that may result in poor diabetes screening and preventive services, non-adherence to diabetic management guidelines, lack of available counselling, and long distance travel to health services. Aged care facilities in rural areas report disparity in the diabetes management compared with their urban counterparts, with these populations more likely to suffer from diabetic complications compared to their urban counterparts. More needs to be done to address the rural-urban inequality in diabetes intervention.

Obesity is one of the major risk factors for diabetes, yet there has been little research focusing on this risk factor across India. Despite having lower overweight and obesity rates, India has a higher prevalence of diabetes compared to western countries suggesting that diabetes may occur at a much lower body mass index (BMI) in Indians compared with Europeans. Therefore, relatively lean Indian adults with a lower BMI may be at equal risk as those who are obese. Furthermore, Indians are genetically predisposed to the development of coronary artery disease due to dyslipidaemia and low levels of high density lipoproteins; these determinants make Indians more prone to development of the complications of diabetes at an early age (20-40 years) compared with Caucasians (>50 years) and indicate that diabetes must be carefully screened and monitored regardless of patient age within India.

An upsurge in number of early-onset diabetes cases is also responsible for the development of various diabetic complications due to longer disease duration, however data on the prevalence on diabetic complications across the whole of India is scarce. A recent international study reported that diabetes control in individuals worsened with longer duration of the disease (9.9±5.5 years),15 with neuropathy the most common complication (24.6 %) followed by cardiovascular complications (23.6 %), renal issues (21.1 %), retinopathy (16.6 %) and foot ulcers (5.5 %).7 These results were closely in line with other results from the South Indian population, however further data from different sections of India is required to be able to assess whether patterns of complications rates vary across the country. Poor glycaemic control, a factor that has been observed in the Indian diabetic population,

is responsible for micro- and macrovascular changes that present with diabetes, and can predispose diabetic patients to other complications such as diabetic myonecrosis and muscle infarction.