Editorial

Adrenergic India: Managing its diabetes

Sanjay Kalra, Vageesh Ayyar[1], Ambika Gopalakrishnan Unnikrishnan[2]

Department of Endocrinology, Bharti Hospital, Karnal, Haryana, [1]Department of Endocrinology, St. Johns Medical College, Bangalore, [2]Department of Endocrinology, Amrita Institute of Medical Sciences, Cochin, Kerala, India

India is an adrenergic nation. No one can doubt this statement. While maintaining its ancient traditions, India is modernizing at a rapid rate. In every sector, ranging from agriculture to manufacturing to services, including health care, signs of progress are visible.

Health care indicators for the country convey the story of progress. Life expectancy of an average Indian has increased from 32–33 years for both genders, in 1947, to 65.77 years and, in 2011, to 67.95 years, respectively.[1,2] The weight of the Reference Indian Man has been increased by the Indian Council for Medical Research, from 55 to 60 kg. Similarly, the Reference Indian Woman has grown heavier by 10 kg, and weighs 55 kg in 2010.[3]

Yet, the progress and modernity of India have come at a cost. In parallel with the socioeconomic changes that we observe, changes in morbidity patterns have been noted. While acute illnesses, such as smallpox, leprosy, polio, and guineaworm have been controlled, chronic and metabolic diseases have become more frequent.

The prevalence of diabetes has risen markedly in India. While data from earlier decades reveals a low prevalence of type 2 diabetes in India, recent workers have reported extremely high rates of diabetes, especially in urban centers.[4,5]

The reasons for this rise in diabetes are not difficult to find. India has become a fast-paced society, moving toward modernization and urbanization. While achieving this laudable goal, changes in dietary intake and physical activity patterns have also occurred. In India the change is more obvious among urban residents, who consume 32% of energy from fat as compared with 17% in rural residents.[6] In the past decade, motor vehicle ownership has increased by 11% annually.[7]

These factors, along with increased stress, have contributed to the increase in prevalence of diabetes. Psychosocial stress, depression, and short sleeping hours, which have become increasingly common in developing countries undergoing rapid economic developments, have been associated with higher risk of the metabolic syndrome and diabetes in Asian populations.[8]

The effect of stress on the endocrine system, including glucose metabolism, is well known. While acute stress may be beneficial in some cases, chronic or sustained stress may cause insulin resistance and hyperglycemia.[9]

Stress, therefore, should be a focus of attention while managing diabetes. Although the Ominous Octet theory of de Fronzo[10] includes various traditional and novel pathophysiologic mechanisms of diabetes, stress seems to have been forgotten. The role of dopamine as the forgotten felon of diabetes has been highlighted earlier.[11]

Nowhere is this more appropriate than in a transitional society, such as that of modern India. Within the central nervous system, dopamine is the most prevalent catecholamine.[12] Tonic stimulation of dopamine is a physiological mechanism for animals to survive the stress of migration or wintering. Sustained or tonic stimulation of the dopaminergic system, on the other hand, is harmful, and may lead to insulin resistance and hyperglycemia.

In modern India, we seem to be living in a highly charged, or sustained hyperdopaminergic state.[13] While this hyperadrenergic or hypercatecholaminergic state is helpful

Access this article online	
Quick Response Code:	Website: www.ijem.in
	DOI: 10.4103/2230-8210.83046

Corresponding Author: Dr. A. G. Unnikrishnan, Department of Endocrinology, Amrita Institute of Medical Sciences, Cochin, Kerala, India. E-mail: unnikrishnanag@aims.amrita.edu

in achieving progress, it does have its demerits. One of them may be the Indian epidemic of diabetes mellitus.

In such a situation, the availability of a dopamine modulating antidiabetic drug, with proven efficacy and cardiovascular safety is a welcome development. Timed release bromocriptine is a novel preparation of a time-tested drug, approved by the USFDA, in 2009, for the therapy of type 2 diabetes mellitus.[11] This is the first drug to be approved by the organization after it laid down stringent requirements for demonstration of cardiovascular safety of antidiabetic drugs.

Bromocriptine is prescribed once daily, early morning, in an initial dose of 0.8 mg/day, as monotherapy, or in combination with other oral drugs. Clinical utility should be maximal in obese, depressed (anhedonic) patients with limited mobility and features of insulin resistance for the therapy of type 2 diabetes mellitus.[12,13]

A detailed review by Shivaprasad *et al*., in this issue of *IJEM*,[14] describes the basic and clinical pharmacology of bromocriptine. An original article contributed by Ramteke *et al*., in this issue, provides evidence of the benefit of this molecule in a clinical trial setting in India.[15] A large multicentric postmarketing study is underway to assess the efficacy, safety, and tolerability of bromocriptine in Indian patients.

Data from this study, and from clinical experience, will provide useful information about the utility of this promising molecule.

References

1. Available from: http://www.census.gov/ipc/prod/ib-9701.pdf. [Last accessed on 2011 Jun 24].
2. Available from: http://www.indexmundi.com/india/life_expectancy_at_birth.html. [Last accessed on 2011 Jun 24].
3. Available from: http://manomayam.blogspot.com/2010/07/ideal-reference-weight-for-indian-man.html. [Last accessed on 2011 Jun 24].
4. Ramachandran A. Epidemiology of diabetes in India: Three decades of research. J Assoc Physicians India 2005;53:34-8.
5. Ramachandran A, Mary S, Yamuna A, Murugesan N, Snehalatha C. High prevalence of diabetes and cardiovascular risk factors associated with urbanization in India. Diabetes Care 2008;31:893-8.
6. Shetty PS. Nutrition transition in India. Public Health Nutr 2002;5:175-82.
7. Siegel K, Narayan KM, Kinra S. Finding a policy solution to India's diabetes epidemic. Health Aff (Millwood) 2008;27:1077-90.
8. Chan JC, Malik V, Jia W, Kadowaki T, Yajnik CS, Yoon KH, *et al*. Diabetes in Asia: Epidemiology, Risk Factors, and Pathophysiology. JAMA 2009;301:2129-40.
9. Mitra A. Diabetes and stress: A review. Ethnomedicine 2008;2:131-5.
10. Defronzo RA. From the triumvirate to the ominous octet: A new paradigm for the treatment of type 2 diabetes mellitus. Diabetes 2009;58:773-95.
11. Kalra S, Kalra B, Agrawal N, Kumar S. Dopamine: The forgotten felon in type 2 diabetes. Recent Pat Endocr Metab Immune Drug Discov 2011;5:61-5.
12. Kalra S. Dopamine: The new frontier in type 2 diabetes. Int J Clin Cases Investig 2010;1:2.
13. Kalra S. Bromocriptine: A revolution in diabetes care? Int J Clin Cases Investig 2010;1:2.
14. Shivaprasad C, Kalra S. Bromocriptine in type 2 diabetes mellitus. Indian J Endocrinol Metab 2011;15:S17-S24.
15. Ramteke KB, Ramanand SJ, Ramanand JB, Jain SS, Raparti GT, Patwardhan MH, *et al*. Evaluation of the efficacy and safety of bromocriptine QR in type 2 diabetes. Ind J Endocrinol Metab 2011;15:S33-S39.