

Editorial

Diabetes Research: Are we doing enough?

This special issue of the IJMR carries a selected set of articles carefully put together by our Guest Editors Drs V. Mohan and M. Balasubramanyam on diabetes, an important emerging life-style disease. As they note¹, India may well have the dubious distinction of another first- the current number of diabetics is all set to zoom from 49.8 million to 69.9 million by 2025. What is more, India is among the few developing countries confronted with the so-called dual disease burden. While on the one hand we are yet to come to grips with the infectious diseases, we need to simultaneously address the galloping non-communicable diseases. But, unlike the communicable diseases like TB, malaria, HIV/AIDS, *etc.*, where there is considerable support from the public health care system in terms of drug availability and accessibility, there is no such facility for non-communicable diseases (NCDs) like diabetes, heart disease, *etc.* The NCDs cannot be called rich peoples' diseases as poor also are affected almost equally and it is well known that at least in India a serious ailment like heart disease or cancer shall mean wiping of family savings. It is therefore very necessary that developing countries like India, China, *etc.*, also should address the issue of diabetes prevention and management with all seriousness and find affordable health products for diabetes. More so as there is enough evidence to show that South Asians are especially prone to diabetes. It is in the context the Special issue of IJMR on diabetes is timely as the various facets of the disease are addressed in depth.

There are some questions that are asked on any R&D carried out in developing countries like India

which have limited budgets and huge demanding agenda. Even in developed countries like the US policy makers routinely ask such questions. Like what kind of research should India be doing? Should we restrict ourselves to looking at better methods and strategies to combat infectious diseases which after all take a huge toll? Or, should any research that generates new knowledge be encouraged? Some argue that in the light of impending dual disease burden, it is time we should start seriously looking at the NCDs. While critics, especially from the west, opine that we should stick to the basics of health care - potable water, sanitation, vector control, *etc.*, and leave research and development to the big boys. Is there enough ongoing research or should we be doing more? What are the areas of research that we should be focusing on? And as a natural corollary, where do we stand internationally? Is our research on diabetes world-class?

A separate article in this issue² takes a quick look at the research output and its 'impact' in terms of citations of global diabetes research as reflected in the Science Citation Index (SCI) for the period 1976-2006. Scientists from India published a total of 3068 papers during the 30 year period or about 1.04 per cent of total global output on diabetes (2,77,781). Considering that India publishes about 13,000 papers per year in SCI-indexed journal in all disciplines and even considering that about half of the output is in biomedical sciences (a conservative estimate) research from India is far from significant. Analysis of data from 1991-2001 by the Institute of Scientific Information, Philadelphia, ranks India in the 22 place (943 papers), the only developing country in the list,

led, of course, by the US with over 100,000 articles on diabetes. Three institutions stand out - the All India Institute of Medical Sciences, New Delhi with about 276 papers and, interestingly, two Chennai based (private) diabetes research centres *viz.*, the Diabetes Research Centre (DRC), with 126 papers and the Madras Diabetes Research Foundation (MDRF), Chennai 83 papers. In fact, V. Mohan (our Guest Editor) from MDRF and A.Ramachandran of DRC authored the maximum number of papers from India *i.e.*, 174 and 173 respectively. What is more, the two researchers from these private (non-industry) research outfits also wrote three of the ten highly (>100) cited papers from India². Another Indian born Canada-based medical researcher Salim Yusuf authored an all time citation classic².

Analysis of highly cited papers (cited >100 times from India) and the top ten all time highly cited papers from the world showed different trends. Just four papers from India were from the clinical research area while three were epidemiological studies and three in basic research. Nine of the ten highly cited papers from the world were on clinical trials. And none of the papers - either from India or from other countries- appeared in an Indian journal. Also, interestingly of the top ten highly cited papers, as many as five were published in the *New England Journal of Medicine* while *The Lancet* and the *JAMA - the Journal of American Medical Association* published two papers each while the *British Medical Journal* published one paper. Only one paper appeared in a speciality journal - *Diabetologia*.

This special issue of the *IJMR* contains a judicious mix of articles from all major areas of research in diabetes from some of the best scientists of the world. These include epidemiology, clinical management, pathogenesis, genetics and basic research giving an excellent sample of the current global research. Also included are the pioneering articles by Banting and Best reproduced from *Journal of Laboratory and Clinical Medicine* (1922) and the *Canadian Medical Association Journal* (1922) and an interesting article by D. McCay *et al* from a 1916 issue of the *IJMR*.

If one looks at the global trends in diabetes research, the focus appears to be towards identifying little understood genetic and environmental factors that trigger type-2 diabetes. The Institute for Scientific Information, Philadelphia did an indepth analysis of diabetes research for the period 1991-2001 identifying the 'hot' areas of research, prolific authors, institutions and the citation profiles. Correspondents of *Science Watch* also spoke to scientists who have authored path-breaking papers. Among the research areas that these scientists find exciting include the factors that trigger type-2 diabetes, prevent the onset of disease or postpone it so late as to minimize complications, understanding immune tolerance, gene therapy, stem cells, new pharmaceuticals, genetic and immunological markers, *etc.* The limited data available from India showed no clear trends in the recent publications. Surely, we are not doing enough. But Indian industry has not done too badly. Dr Reddy's Laboratory, Hyderabad is in the midst of phase III clinical trials of a new class of anti-diabetic drugs, an insulin sensitizer for type-2 diabetes. The Bangalore-based Biocon, after introducing Insugen- the first human recombinant insulin in India has an intra-nasal insulin spray - Nasulin entering phase 2 clinical trials for type-2 diabetes.

We would like to thank all the authors for acceding to our request to contribute articles and our Guest Editors V. Mohan and M. Balasubramanyam for so painstakingly putting together such an excellent collection of papers.

K. Satyanarayana

e-mail: kanikaram_s@yahoo.com

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