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MEETING THE CHALLENGES OF STROKE IN INDIA

Worldwide, cerebrovascular diseases are responsible for 6.15 million deaths (10.8% of all deaths)¹ and are the second most common cause of mortality; 87% of stroke deaths occur in low- or middle-income countries.² With the world's second largest population, India is witnessing several adverse trends for the cardiovascular health of its population, including a rapid rise in the proportion of patients with diabetes and dyslipidemia, and the relative lack of exercise among the general population. India has the world's largest population of patients with diabetes, with over 62 million people with diabetes in 2011.³ At the current time, the population in India is projected to have over 1 million strokes per year. This figure will surely rise in the coming decades due to longer life expectancy and the downstream influence of risk factors such as diabetes.

Prevention and treatment of stroke in India has many challenges. High rates of poverty, especially in rural locations, and the relative lack of national or private health insurance have resulted in reduced access to medical care and suboptimal implementation of primary and secondary cardiovascular preventive strategies. The lack of organized stroke care networks⁴ even in urban areas makes effective acute stroke intervention difficult.

To meet the challenges of stroke in India, the Indian Stroke Association (ISA) was established in 2002. The Web site of the association is www.stroke-india.org (or www.indianstrokeassociation.com). The ISA now includes 600 members, including only 8 neurologists trained in vascular neurology and dedicated stroke specialists. The ISA has the following goals:

1. To undertake scientific research in the area of stroke.
2. To provide research facilities for basic and clinical research pertaining to stroke.
3. To promote enhanced quality of care for stroke patients in India through the development of guidelines and designated hospitals.
4. To promote education on stroke risk factors and warning signs to the general population.

5. To promote, develop, and provide exchange of knowledge as well as technical cooperation between similar research institutions.

To achieve these goals, the ISA has hosted an annual scientific conference each year since 2005 and plans to publish a journal in the near future. International experts from the United States, Europe, and the Asian region are invited to deliver talks and conduct workshops. To enrich the academic scientific program further, in March 2012 in the annual conference we conducted Clinico-Pathological Conferences on 2 interesting cases of stroke, one from Massachusetts General Hospital and another one from India. This activity was the high point of the conference. In 2010, the ISA, along with the Indian Academy of Neurology, published national guidelines for the management of stroke in India, available on the Web sites www.stroke-india.org (or www.indianstrokeassociation.com) and www.ianindia.com.

More than 20 centers in the country are equipped to provide recombinant tissue plasminogen activator in stroke. The number of stroke units in the country has increased from 8 in 2009 to 20 in 2012. As part of the Stroke Training Program (STP), Continuing Medical Education sessions are organized on a regular basis to educate neurologists, internists, and general practitioners on various aspects of stroke. A workshop with the theme "Time is running out: ACT NOW" was organized in 6 major cities of India 3 years ago. Similarly, focused workshops to teach residents are organized annually. Plans are in progress to develop criteria for the certification of hospitals as either Primary or Comprehensive Stroke Centers. For physicians in training or younger neurologists, plans to further intensify STPs are underway. The first summer school is planned for the year 2013. Tele-stroke units in academic institutes and corporate hospitals are being planned to be linked to centers in the semi-urban and remote areas to intensify stroke care.

In the area of public education, the ISA has become an affiliate of the World Stroke Organization (WSO). Cities in India have promoted World Stroke Day. Celebrity spokespersons have filmed infomercials

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(<https://www.youtube.com/watch?v=h8Dw831xs-E>) and print ads to highlight stroke warning signs and symptoms, risk factors, and the “One in every six” campaign of the WSO. These infomercials were endorsed by the ISA and the WSO, distributed free of cost to neurologists and consultant physicians, displayed in the waiting areas of hospitals and clinics, and aired on national television. Public education programs through lectures by experts and question-answer sessions are carried out in different cities every year on October 29 (World Stroke Day). Stroke walks have been another mode of enhancing awareness. In schools, handouts and books with information on the recognition and prevention of stroke have been distributed in order to educate children, and in turn their parents and grandparents.

Finally, the ISA’s executive committee has appointed a distinguished set of stroke experts as “international advisors” from different parts of the world. The ISA is in the process of envisaging grants for national and international scientific applications by its members and international advisors in order to promote collaborative stroke research and develop stroke infrastructure in India. With global collaboration and intensified local efforts, Indian neurologists are hoping to successfully tackle the daunting challenges of stroke in India.

AUTHOR CONTRIBUTIONS

Dr. Man Mohan Mehndiratta: conceived and designed the manuscript, data acquisition, critical review of the manuscript. Dr. Anesh Singh: critical review

of the manuscript. Dr. Seemant Chaturvedi: conceived and designed the manuscript, drafted the manuscript. Dr. M.R. Sivakumar: data acquisition, critical review of the manuscript. Dr. Majaz Moonis: data acquisition, critical review of the manuscript.

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