Regional Review

Stroke Care in Sri Lanka: The Way We Were, the Way We Are, and the Way Forward

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Abstract

Sri Lanka is a lower-middle–income country with a high Human Development Index. Stroke is a primary cause of death and disability in the country, and demographic and epidemiological transitions are likely to lead to a large increase in the burden of stroke. Although impressive health indicators have been achieved due to an excellent primary health-care structure, Sri Lanka has been slow to develop and expand modern stroke care. A majority of the patients with acute strokes are treated in state-sector hospitals where facilities for state-of-the-art acute stroke care are limited. Neurologists are low in number, and general physicians provide acute stroke care for most of the patients. Epidemiological data on stroke in Sri Lanka are scarce. Previous studies have shown low quality of stroke care and significant gaps in stroke awareness. Noteworthy gains have been made since the turn of the century, and recent trends in development of stroke care are promising. There is a clear need to improve manpower, infrastructure, and training that will lead to improvements in the existing services in terms of acute care, rehabilitation, and community support. More research data are needed to guide strategies to minimize the burden of stroke, and more concerted efforts are needed to make stroke care in Sri Lanka ready to face the challenges of the 21st century.

Keywords

Stroke, care, Sri Lanka, South Asia, resource-limited setting

Sri Lanka: At a Glance

Sri Lanka is a tropical island-nation in the Indian Ocean with a land area of 65,610 sq. km, population of 21.2 million, sex ratio (number of males per 100 females) of 93.8%, and a population density of 338 per sq. km.[1,2] A policy of providing free education and free health, sustained over many decades, has enabled Sri Lanka to consistently perform well in terms of social indicators. It has a life expectancy of 75 years at birth (male 72; female 78), and a literacy rate of 93.2% (male 94.1%; female 92.4%), which are among the best in South Asia.[1,2] The country is placed in the high human development category, with a Human Development Index (HDI) rank of 73 out of 188 countries: it is ranked highest among the South Asian countries.[3] Recent improvements in economic indicators have seen Sri Lanka placed in the lower-middle–income category in the World Bank grouping, with a per capita gross domestic product (GDP) in 2016 of USD 3,835 and per capita gross national income (GNI) of USD 3,727.[1,4]

Sri Lanka has traditionally been seen as a role model in health development in a developing country. A robust primary health care delivery system has provided the country with impressive health care indicators. Its infant mortality rate (8.2 per 1,000 live births), maternal mortality rate (26.8 per 100,000 live births), and healthy life expectancy (HALE) at birth (female 70·5 years; male 65·1 years), for example, are among the best in South Asia.[1,5] These gains have been achieved in spite of a rather low investment of only 1.66% of its gross national product (GNP) on health.[1]

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In parallel to the improvements in socioeconomic conditions and population health, the country is witnessing changes in the population structure and dynamics which pose new challenges to health care delivery. Sri Lanka has a rapidly aging population. Currently, 12.4% of the population are in the 60 years and over segment, and the aging index (ratio between the 60 years and over population to 0-year to 14year population) has increased from 18.8% in 1981 to 49.1% in 2015.[2] Nearly 1/5th (18.2%) of the population lives in urban areas, and urban population growth is at 1.4 %.[2,6] These trends have led to an epidemiological transition: chronic non-communicable diseases are now the main cause of death in Sri Lanka, accounting for 71% of all annual deaths.[2]

Stroke in Sri Lanka

Hospital statistics, which are the only reliable source of morbidity and mortality data in Sri Lanka, indicate that cerebrovascular diseases are the 6th leading cause of death in the country, accounting for 8.2% of all hospital deaths.[2] Stroke mortality is probably underestimated, as sudden deaths are more likely to be recorded as cardiac in origin, especially in out-of-hospital deaths. According to the Global Burden of Disease 2016 data, stroke is also the 4th leading cause of premature mortality (total YLLs - years lost to life) and the 5th leading cause of all-age disability-adjusted life years (DALYs) in Sri Lanka.[5,7]

Epidemiological data on stroke in Sri Lanka are limited. A multicenter, WHO-initiated stroke incidence study in 1974 yielded an age-adjusted incidence of 1.89 per 1,000 population.[8,9] This was based on data from stroke admissions to 3 main state hospitals in Colombo which were extrapolated to the population of the city of Colombo. There are no community-based data on stroke incidence in the country. Two studies on stroke prevalence in 2 different urban communities have produced fairly similar results. A study in 3,000 households in the Kelaniya health administrative area (2001-2002; n = 14,186; all age groups) yielded an age-adjusted prevalence of 9.61 per 1,000 population.[10] The second study in the Colombo district (2011, n = 2,313; adults ≥18 years) produced a crude stroke prevalence of 10.4 per 1,000 adults.[11]

Stroke Care in Sri Lanka: the Way We Were

Stroke patients in the late 20th century United Kingdom were reported to be "…shunted to the far end of the ward, and left unnoticed by the busy nurses…," and "… the consultant's interests lay elsewhere. …main concern was disposal; the consultant wanted his bed back…."[12] Stroke care in Sri Lanka at the turn of the century was no different: stroke remained a much-neglected illness that received little attention from clinicians, researchers, and policymakers. The available health care systems at the time were considered to be "ill-equipped to meet the challenge of the increasing burden of stroke, with limited infrastructure for organised acute stroke care, and virtually non-existent multidisciplinary stroke rehabilitation services."[13]

An audit of acute stroke care at the Institute of Neurology, National Hospital of Sri Lanka (NHSL), Colombo, in 1997 was the first study of available stroke services in the country and highlighted serious deficiencies. We audited the process of care received by all patients with stroke admitted to the Institute of Neurology over a period of 3 years (1994-1997; n = 263), using the Royal College of Physicians of London stroke audit package. Care was rated "Poor" or "Very poor" for 58.4% of the audit items tested. Care related to rehabilitation planning, discharge planning, and secondary prevention were rated as very poor.[14] The audit was an eye-opener and proved to be a catalyst that transformed the structure and process of stroke care at the Institute of Neurology, NHSL. The most important of these was the establishment of the first stroke unit in the country at the NHSL in 1998. This was a basic stroke unit, demarcated from the existing neurology beds, for short- to medium-term care. The first multidisciplinary stroke team was assembled, with specialist inputs in speech therapy, physiotherapy, occupational therapy, and social services support.[14] This was followed by the establishment of the first dedicated multidisciplinary stroke clinic at the NHSL in 2000. These changes paved the way for the development of modern stroke care in the country.

With a view to evaluating the effectiveness of the fledgling stroke unit, we repeated the stroke audit in 2001 using the same audit package and methodology (1998-2000; n = 192). Significant improvements in care were noted in 83.3% of the audit items tested. Care was graded as "Very good" or "Good" for 56.7% of audit items, compared with 20% in the first audit. There were several improvements in relation to certain aspects of care that had scored poorly in the first audit, such as neurological assessment, evaluation of risk factors, CT scanning, rehabilitation-oriented clinical assessments, and initiation of secondary preventive measures. We were able to demonstrate that establishment of a stroke unit can lead to improvements in stroke care, even in a resource-limited setting.[15] This was one of the first reports of stroke unit-related improvements in stroke care from a developing country.

Stroke Care in Sri Lanka: The Way We Are

Although accurate data are limited, it is believed that most of the acute strokes in the country are treated in hospitals. In 2015, there were 44,130 admissions to state hospitals and 3,584 in-hospital deaths due to cerebrovascular diseases.[2] In Sri Lanka, allopathic (Western) medical care is provided through both state and private sectors, with ~95% of in-patient care provided by state hospitals. There are 631 state-sector hospitals in the country, with 3.8 hospital beds per 1,000 population. Specialist care is provided in

16 teaching hospitals, 3 provincial general hospitals, 20 district general hospitals, and 71 base hospitals.[2]

There are only 45 neurologists in Sri Lanka serving a population of 21.2 million; this approximates to 1 neurologist per 470,000 population, which is way below the ratio of at least 1 neurologist per 100,000 considered the acceptable norm for the Asia-Oceania region, considering the economic diversity of the region.[16] Of the 45 neurologists, 38 are attached to 22 state-sector hospitals in 17 of the 25 administrative districts (Figure 1). It is believed that the majority of patients with acute stroke are managed in medical units headed by specialist physicians (in internal medicine) in the 110 state-sector hospitals providing specialist care. There are no specialist stroke physicians/stroke neurologists in the country.

A survey was conducted in March 2018 to gain an insight into the existing stroke services in Sri Lanka. Neurologists attached to all the neurology units in state-sector hospitals were invited to participate in an email survey over a period of 2 weeks, and data were received regarding 21 of the 22 hospitals (95.5%). On average, 63.5 acute stroke patients are admitted to these hospitals per month. A stroke unit or dedicated stroke beds were available in 9 hospitals.

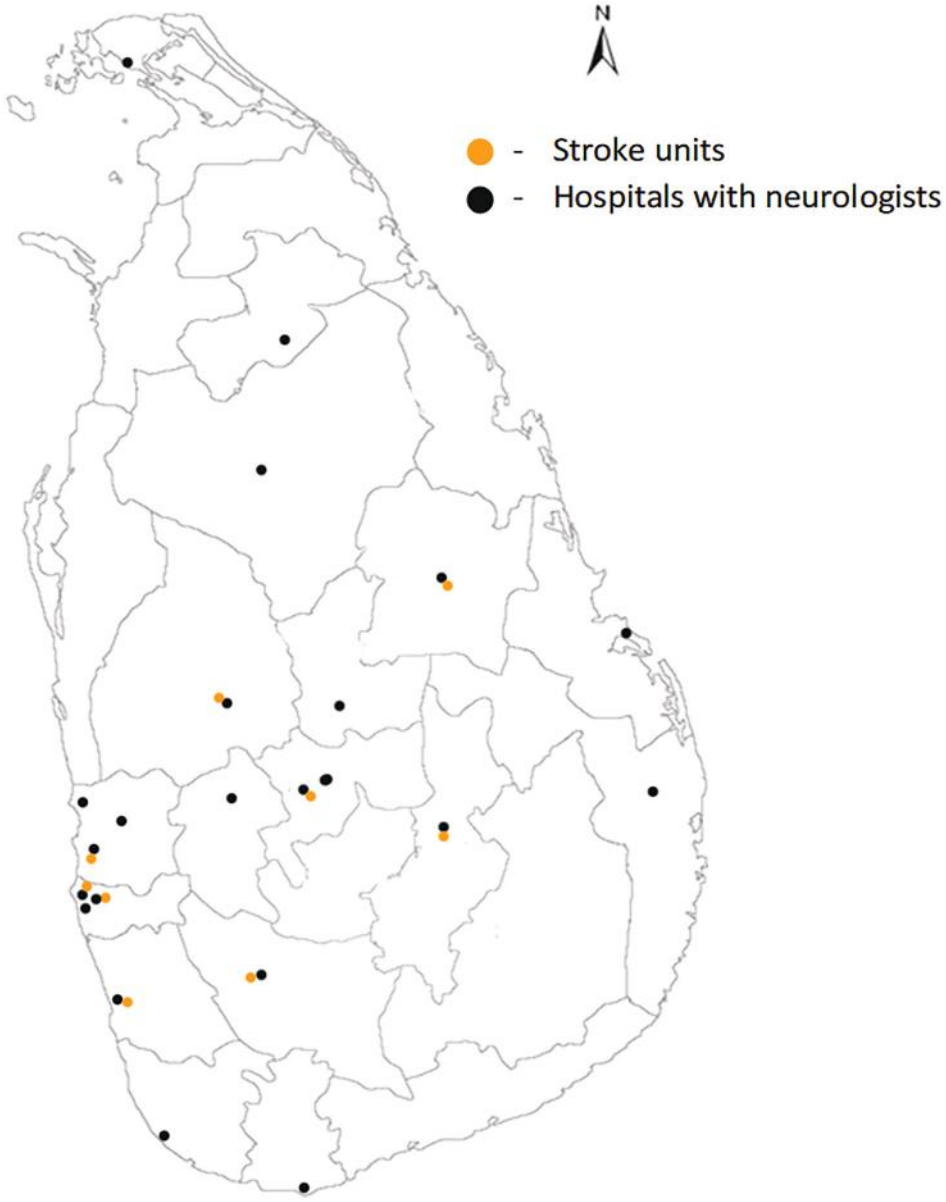

Figure 1. Distribution of State-sector Hospitals with Neurologists and Stroke Units by Administrative District in Sri Lanka

Physiotherapy, occupational therapy, speech therapy, mental health services, and social services support were available in 100%, 90.5%, 81%, 90.5%, and 66.7% of the hospitals, respectively. Only 12 hospitals (57.1%) had nurses trained in stroke care. CT scanning was available in 18 (85.7%) of the hospitals, and MRI was available in only 4 (19%). Thrombolysis was provided in 14 (66.7%) hospitals, and mechanical thrombectomy was available only at the NHSL (U.K. Ranawaka, Results of a survey among Sri Lankan Neurologists, March 2018).

Developments in acute stroke care have progressed at a slow pace, and Sri Lanka has been lagging behind even the neighboring countries in the region. Thrombolysis was started in 2008, and rates of thrombolysis remain low at approximately 3% in the centers where it is available (Dr Senaka Bandusena, written personal communication, 13 March 2018). The first mechanical thrombectomy was done in a state hospital only in early 2018 (Dr Padma Gunaratne, written personal communication, 28 March 2018). Rehabilitation facilities are limited, and long-term in-patient rehabilitation is provided only in 8 state-sector rehabilitation hospitals. There are no specialist rehabilitation physicians or rehabilitation units for short-term rehabilitation in hospitals where acute stroke patients are treated. Community-based rehabilitation services are virtually nonexistent. The Ayurveda system of indigenous medicine is in widespread use in the country, especially in rural areas, and many patients still turn to Ayurveda treatment for long-term care. A study at the NHSL found that over 90% patients had sought alternative medicine after leaving hospital,[17] highlighting the failure of the available services to meet the expectations of patients and families.

Stroke awareness is a key determinant of treatment-seeking behavior and stroke-risk-reduction behavior.[18] The first study on stroke awareness in Sri Lanka was conducted in 750 households in an urban Sri Lankan community in 2000-2001 (711 adults, 155 schoolchildren). Only 36.8% of the participants recognized the brain as the organ involved in a stroke. Many recognized hypertension as a risk factor, but awareness was inadequate regarding heart disease, diabetes, elevated cholesterol levels, and smoking. Only 60.1% thought stroke was preventable. More than half of the participants (56%) were rated to have "Average," "Poor," or "Very poor" knowledge. There was no significant difference in awareness between adults and schoolchildren, or between those <60 years and ≥60 years of age.[19] There are only a few reports on stroke awareness from South Asia, and this study highlighted many areas of deficient knowledge on stroke in a community setting and the need for comprehensive public education programs.

The enthusiasm for change generated with the establishment of the first stroke unit at the NHSL in 1998 led to the creation of the National Stroke Association of Sri Lanka (NSASL) in the late 2000s by a group of concerned medical and non-medical professionals. Since then, the NSASL has been in the vanguard in creating public awareness on stroke. Over the years, it has conducted numerous educational activities such as media campaigns, stroke walks, health camps, interschool competitions, and stroke seminars in workplaces, schools, and public fora in many parts of the country. A National Stroke Day was declared in Sri Lanka in 2003 following concerted lobbying by the NSASL, which becomes a time for intensifying awareness activities. The campaign organized by the NSASL was elected the gold award winner in the World Stroke Day activities of the World Stroke Organization in 2009.[20] The NSASL has also been engaged in capacity building, and has conducted numerous training workshops for healthcare workers and caregivers across the island.

Research into stroke in Sri Lanka is rather limited. There have been only a few community-based studies, and there are no national-level epidemiological data. The Ragama Stroke Registry was established at the Colombo North Teaching Hospital in 2007 with a view to collecting data from all the stroke admissions to an entire hospital,[21] and several similar hospital-based registries have followed.[22] A few registries have joined together to form a Stroke Registry Network in 2014, which was the first attempt at generating national-level stroke data.[23] A Sri Lanka Stroke Clinical Registry was launched in 2015 with Web-based data collection at the hospital level by nursing officers in many parts of the country (Dr Padma Gunaratne, written personal communication, 28 March 2018).

Stroke Care in Sri Lanka: The Way Forward

Notwithstanding the impressive gains made in primary health care, Sri Lanka has been slow to embrace new advances in acute clinical care. Stroke care is no exception, but there has been movement in the right direction, albeit sluggish, over the last few years. The NSASL has worked in close collaboration with the Ministry of Health to formulate plans for a National Stroke Center and 10 new stroke units in the country. The private sector has started investing in acute stroke care in a recent healthy development. Thrombolysis is available in several private hospitals in a few main cities, and a private hospital in Colombo has been providing endovascular treatment since 2013 (Dr Lakmalie Paranahewa, written personal communication, 4 April 2018). A dial-up ambulance service (dial 1990—*Suwa Sariya*) was launched by the government in 2016 and provides emergency transport free of charge in several parts of the country.[24] It is hoped this will be extended to provide island-wide coverage and developed to provide prehospital care. Training has commenced in the new specialty of rehabilitation medicine, and the Association of Sri Lankan Neurologists is advocating for the training of stroke neurologists.

There is a clear need to improve the existing services for acute care as well as the rehabilitation and community

support services. These would require large investments in manpower, infrastructure, and training. More emphasis, however, is needed on developing strategies for preventing strokes in the community, which is the best way to minimize the burden of stroke in a resource-limited country like Sri Lanka. Such campaigns are likely to succeed in Sri Lanka, perhaps more than in other developing countries, as promotion of preventive measures at grassroots level would not be too difficult due to the high literacy rates and the well-developed public health network. Effective preventive strategies can only be built on good epidemiological data on stroke, and neurologists must lead the way in generating national-level data. Clearly, much more needs to be done to take stroke care in Sri Lanka into the 21st century.

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