

**Letter to Editor****Ghulam Murtaza, PhD**Department of Neurology  
College of Medicine, King Saud University  
Riyadh, Saudi Arabia**Razia Sultana, MSc**Institute of Agricultural Sciences  
University of the Punjab  
Lahore, Pakistan**Address for correspondence:**Ghulam Murtaza  
Department of Neurology  
College of Medicine, King Saud University  
Riyadh, Saudi Arabia  
**Email:** gmurtazay@yahoo.com**Received,** 22 January, 2017**Accepted,** 9 March, 2017

**S**troke is the leading cause of death and disability globally. About one third of patients after surviving from stroke become dependent on others for care and financial support.<sup>14</sup> There are two types of stroke, ischemic and hemorrhagic, which occur due to lack of blood flow and bleeding, respectively. The symptoms of stroke include dizziness, weakness in the arm or leg, particularly on one side of the body, dizziness, loss of balance, difficulty in seeing, speaking or understanding speech, and sudden severe headache. The risk factors for stroke include high blood pressure, diabetes, smoking, inactivity, obesity, old age, high cholesterol levels, atrial fibrillation, thrombophilia, migraine with aura, heredity, and prior stroke attack.<sup>8</sup> In Nepal, ischaemic stroke is more prevalent than hemorrhagic stroke. Initially, smoking and alcohol consumption were considered as the main risk factors for stroke, however recent studies have indicated hypertension as the main reason for stroke. In 2012, there was 3 fold increase of hypertension in last 25 years, which was attributed to higher salt intake, urbanization, and socio-economic transition.<sup>12</sup>

Stroke is a costly disorder with respect to individual, familial and social life. In 2005 alone, about 16 million first-ever stroke cases were recorded globally with 5.7 million deaths and, it is expected that there will be an increase to 23 million first-ever stroke cases and 7.8 million deaths by 2030.<sup>6</sup> About 85% of all stroke deaths occur in low- and middle-income countries. In Nepal, it is one of the major diseases and causes of death. In 2006, there were about 50,000 people with stroke. Fifteen thousand people die from this disease annually.<sup>10</sup> The long-term impairments after stroke are hugely adverse for both individual and other care sectors. Stroke patients may lose their job,

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thus instead of supporting themselves and others, they will be depending on them. This impact can significantly be observed in low-income countries and, where joint family system prevails such as Nepal. The developed industrialised countries are spending huge money for stroke management. Previously, stroke prevalence was relatively higher in the developed countries. However, recently, it has switched to low- and middle-income countries with about 20% increase.<sup>2</sup>

**Transcranial direct current stimulation (tDCS)**

It is a cheaper, non-invasive, painless, and safe method for the treatment of neurological disorders including stroke. The requirements of tDCS are a constant current stimulator and surface electrodes soaked in normal saline. The current density up to 25 mA/cm<sup>2</sup> is not harmful for brain tissue, thus application of normally used current (1-2 mA/cm<sup>2</sup>) in tDCS falls within the safety limits.<sup>4</sup> The anode electrode increases while cathode electrode decreases excitability, respectively. The modulation in excitability by tDCS is of clinical importance with significant improvements in outcomes of neurological impairments.<sup>3</sup> Recent studies have revealed importance of tDCS not only in the rehabilitation of stroke patients but also in intervention on stroke risk factors.<sup>13</sup> tDCS has advantage over other stimulation methods due to its ease of use, large size of electrodes, and its portability. Stimulation through large electrodes affects a wider region of brain including primary motor cortex, premotor, supplementary motor, and somatosensory cortices. All these regions of brain are associated with the recovery process in various diseases.<sup>5</sup> However, certain factors may limit its application, which include its poor temporal resolution and anatomical localization. In addition, individuals' differences in hair, scalp, and bone composition can hinder current movement to the brain.<sup>9</sup>

It is well documented that risk of stroke increases with increase of age. However, in South Asian countries including Nepal, rate of young stroke incidence is higher compared to developed western countries, which is alarming condition for any country.<sup>7</sup> In Nepal, about 2% of hospital admitted patients have stroke attack, which are expected to project if stroke remains uninterrupted.<sup>1</sup> Rapid urbanization with low physical activities and existence of multiple risk factors such as hypertension, smoking, and alcohol consumption can further increase the risk of stroke incidence.<sup>10</sup> It depicts greater economic burden

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on government in future. Experience of high-income countries illustrates that about 4% annual average decline in stroke mortality is achievable by intervening stroke risk factors and adopting better rehabilitation programs.<sup>11</sup>

Thus, in Nepal, introduction of tDCS being effective technique will not only improve the conditions of stroke patients but will also counter stroke risk factors. Moreover, as tDCS is inexpensive and easy to administer, its implementation will reduce the burden of stroke on Nepal government.

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