Research Article

Profiling of clinical characteristics of stroke in young - ISH experience

JAIISH(2014)
Vol 33, pp. 106-110

Premalatha B. S.[a] Swetha, G.[a], Sujatha S. [a], Deepthi Dechamma[a], Namratha R.[a] and Ruby Sunny[a]

Affiliations

[a]Dr. S. R Chandrasekhar Institute of Speech & Hearing, Bangalore

Corresponding Author

Dr. B.S.Premalatha
Professor & Head of Department
Dr. S. R Chandrasekhar Institute of Speech & Hearing,
Bangalore 560084
drbspremalatha@gmail.com

Key Words

Stroke
Age
Young individuals

Abstract

The impact of stroke on the individual's family and society is strongest when it affects a young individual. The study profiles the characteristics of stroke in young individuals, onset of stroke, age, gender, education, occupation, family history of stroke/other disability, aetiology, radiological findings, assessment by SLP for language intervention, therapy sessions and prognosis of 52 individuals with adult neurogenic speech and language disorders in the age range of 15-49 years . More men suffer (30%) with stroke than women,46(88%) had sudden onset of stroke whereas 6 (12%) reported of gradual onset, 5 had a positive family history of stroke and 7 reported of other illness. Majorities had completed graduation and were skilled. As observed in the study, occurrence of stroke related to a single cause was found to be the most common among young individuals.

Introduction

Stroke is the rapid development of a focal neurological disturbance lasting more than 24 hours or leading to death. Ischemic strokes account for 50% - 85% of all strokes worldwide. Thrombotic stroke is due to fatty plaque and an embolic stroke is by blood clot that interrupts blood flow to the brain.Hemorrhagic strokes is common in younger adults. Stroke clients exhibit multiple functional problems and determined by the extent and site of brain injury. According to Dalal, Bhattacharjee, Vairale, and Bhat (2007)listed that approximately 20 million people each year suffer from stroke and the developing countries account for 85% of global deaths from stroke.

Age has the strongest association with the incidence of stroke. The age-specific incidence of stroke increases progressively with increasing age. The impact of stroke on the individual's family and society is strongest when it affects a young individual. Prasad and Singhal (2010) complied reports indicated the lower limit of the age varies from 0 to 25 years in various reports with majority keeping it at 15 years. The upper age limit also varies from 40 to 55 years, majority being around 45 years. The latest estimates of 2006 indicate that the age group of 15-49 years constitutes 52% of the population in India. Therefore, future studies may consider keeping 15-49 years (<50 years) as the age group for studies on stroke in young, as reported by Shah and Mathur (2006).There is a need to understand the factors leading to the increase in the incidence of stroke, especially in younger individuals.

The present study aims at profiling the various characteristics of stroke in young individuals, such as onset, age group, gender, education, occupation, family history of stroke/other disability, aetiology, CT/MRI findings, approaching a SLP for assessment and management, details on the therapy sessions, prognosis and termination of therapy sessions in young individuals with stroke.

Method

The present study followed a retrospective design.

Participants: The participants of the study were 52 individuals with adult neurogenic speech and language disorders in the age range of 15-49 years and having the etiology of stroke were considered as the inclusion criteria and greater than 49 years were excluded.

Procedure: The study was done in 2 stages. In stage 1 case records of individuals with the etiology of stroke was viewed for 5 years from 2009-2014 in order to obtain the information of younger individuals suffering from stroke. Stage 2 included the extraction of number of stroke in young adults with neurogenic speech and language disorders.

Stage one: Case records of individuals who suffered from stroke leading to adult neurogenic speech and language disorders were registered for speech and language assessment. The tests administered post stroke were Western Aphasia Battery (WAB), cranial nerve assessment, Frenchay Dysarthria Assessment (FDA), Montreal Cognitive Assessment (MoCA), Boston Naming Test (BNT), Addenbrooke's Cognitive Examination- Revised (ACE-R), Mini Mental State Examination (MMSE) and dysphagia assessment in the department of speech and language studies for the last 5 years i.e., from 2009-2014. Totally, 95 subjects appeared to have adult language disorders. The records of these individuals were reviewed to obtain the information about the number of younger individuals with stroke resulting in adult neurogenic speech and language disorders. Of the 95, 52 were in the age range of 15-49 years.

Stage two: For a final review in the study, 52 young individuals between the age range of 15-49 years, with adult neurogenic speech and language disorders were chosen. There were 43 males and 9 females. A detailed profiling of all the characteristics was done to highlight those contributing to the rising incidence of stroke in young individuals. The data was then compiled in an excel database sheet which included different characteristics such as age group, gender, onset, education, occupation, family history of stroke/other disability, aetiology, CT/MRI findings, diagnosis, approaching an SLP for assessment and management, number of therapy sessions attended, prognosis and termination of therapy sessions.

Results

The study aims at profiling the various characteristics in stroke in young individuals, such as age group, gender, onset, education, occupation, family history of stroke/other disability, aetiology, CT/MRI findings, diagnosis, approaching an SLP for assessment and management in young individuals with stroke.

Age and Gender wise distribution: Age wise distribution indicated a rising incidence of stroke among the Indian population. According to our study it was noted that 54% of them belonged to a younger age group. Male to Female ratio varied from 1: 5, indicating that for every 5 males, there is 1 female suffering from stroke. The findings from the study compiled by Prasad and Singhal (2010) suggested that the incidence of stroke is likely to rise in the coming years in India due to increase in the population, increase in life expectancy, urbanization of cities, changing life styles involving habits such as smoking, excess alcohol use, increased stress level in life.

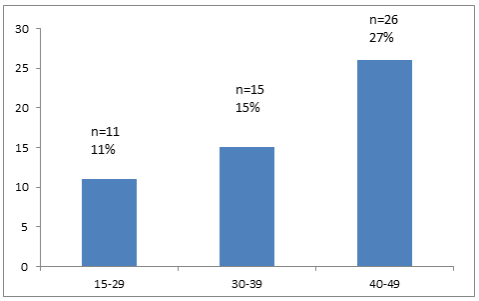

Figure 1: Age wise distribution of stroke in individuals in the age range of 15-49 years.

According to the study by Sethi (2002) male/female sex ratio in India is 7:1. The higher incidence of stroke in males may be due to differences in risk factors such as smoking and drinking which are more prevalent among men in India as compared to women according to Das and Banerjee (2008).In terms of gender differences, 30% more men suffer from stroke than women was observed in our study also. Study done by Nayak, Nair, Radhakrishnan, and Sarma (1997) reported that 76% of the male and 24% of female patients of the 177 patients had first ever ischemic stroke in the age group between 15 to 45 years.

Figure 1 depicts the occurrence of stroke in young individuals between the age range of 40-49 years as the most common, followed by 30-39 years and 15-29 years which is comparatively a higher percentage in the age wise classification.

Taylor and Suresh Kumar (2012) stated that the prevalence of stroke is 55.6 per 100,000 across all ages. Every year1.44-1.64 million cases of new acute strokes are reported. According to a study done by Banarje, Roy and Bhoi (2005) on global stroke estimates, it was found that 400-800 strokes occur per 100,000.15 million new acute strokes reported every year.

An estimate done by Shah and Mathur (2006) states that 12% of all strokes occur in those less than 40 years. Study done by Dalal, Malik, Bhattacharjee, Trivedi, Vairale and Bhat (2008)states that,in India the prevalence of stroke in younger individuals is high (18-32%). 12% of strokes occur in the population aged less than 40 years.

Onset of stroke with family history and other illness: Out of 52 young individuals, 46(88%) had sudden onset of stroke and 6(12%), gradual onset. As obtained from the present study, 5 of the 52 individuals had a positive family history of stroke while 7 had a positive family history of other illness such as mental retardation, physical defect and epilepsy.

Olivares, Castaneda, Grife and Alter (1973) examined the risk of stroke in Mexican patient's and found that, onset of signs and symptoms were sudden in 61% and more gradual in 37%. The majority

of patients with hemorrhage and embolus presented with sudden onset.

In a study, done by Lee, Hsu, Chen, and Cheen (2002) on analysis of stroke in young from south East Asia reported that 29.3% had family history of stroke.

Education and stroke: In the present study, education has been classified as: Primary education includes classes from 1^{st} - 5^{th} standard, upper primary education includes 6^{th} & 8^{th} standard, secondary education includes classes from 9^{th} - 10^{th} standard, senior secondary education includes pre-university college i.e., 11^{th} and 12^{th}, and under graduate and post-graduate are also included.

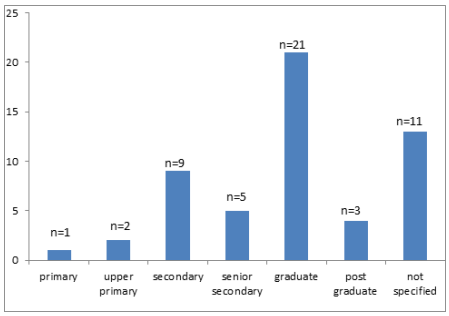

Figure 2: Education and Stroke.

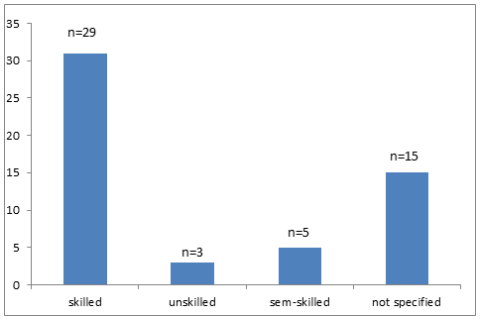

Figure 3: Occupation and stroke.

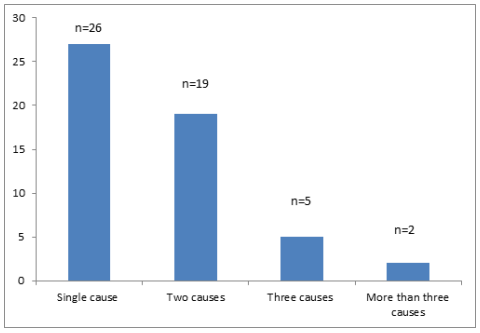

Figure 4: Etiological factors and stroke.

Figure 2 reveals an interesting observation that majority of participants had completed graduation, followed by secondary education, senior secondary education, post-graduation, upper primary schooling and primary education.

Occupation and stroke: A skilled employee is one who is capable of working independently and efficiently and turning out accurate working. An un-skilled employee is one who possesses no special training and whose work involves the performance of the simple duties which require little or no independent judgment or previous experience but needs to be familiar with the work environment. A semi-skilled employee is one who has sufficient knowledge of the particular trade to do respective work and simple job with the help of simple tools and machines.

Figure 3 depicting the relationship between occupation & stroke. It indicates that the majority of the participants were skilled followed by semi-skilled and unskilled. Occupation details of 15 participants could not be obtained due to non-availability of information.

A study by Tsutsumi, Kayaba, Kario and Ishikawa (2009) identified 147 incidence of stroke during the 11 year follow up period which reveals that men with high strain jobs were nearly 3 times more likely to suffer from a stroke than men with low strain jobs. No statistically significant differences were found among all the female participants.

Etiological factors and stroke: As observed in our study, occurrence of stroke related to single cause like hypertension, alcohol consumption, traumatic brain injury, arterial venous malformation, hypothyroidism, MoyaMoya disease, viral encephalitis and emotional distress was found to be the most common among young individuals followed by those with aetiology related to 2 causes such as hypertension and smoking, smoking and alcohol, hypothyroidism and anaemic, diabetes and hypertension, traumatic brain injury and smoking, alcohol consumption and cholesterol. A limited number reported an aetiology related to 3 causes like high blood pressure, smoking and alcohol and hypertension, diabetes, seizures and hypothyroidism, anaemic and emotional distress, and a very small number of subjects reported an aetiology of more than 3 causes like low blood pressure, vertigo, headache, smoking and alcohol consumption, diabetic neuropathy, chronic kidney disease and hypertension.

From figure 4, it can be observed that occurrence of stroke related to single cause is most common followed by those with 2 causes and a very limited number with 3 causes followed by a very small number of subjects with more than 3 causes.

Lee, Hsu, Chen and Cheen (2002) also observed that the risk factor was smoking in 49.8% from south East Asia

As per a study done by Sridharan et al. (2009), individuals with stroke across all age groups with

respect to the risk factors of ischemic stroke, it was reported that hypertension (83.2%), electrocardiogram abnormality, heart disease of any type, diabetes (49.9%), smoking (26.8%) and alcohol were associated with stroke.

Study done by Nedeltchev, der Maur , Georgiadis, Arnold Caso and Mattle, (2005) of 203 patients of stroke in age range of 15-45 years from Switzerland observed that hypercholesterolemia (39%), smoking (46%) and hypertension was present in 19% patients only.

Olivares, Castaneda, Girfe and Alter(1973) examined the various illness prior to onset of stroke revealed that hypertension was reported by 62%, which was more common in patients with hemorrhagic stroke , 36% by cardiac disease, and 25% by diabetes mellitus. A study done by Putaala, Metso, Metso , Konkola, Kraemer and Haapaniemi (2009) on 1008 individuals with ischemic stroke between the age ranges 15-49 years from the Helsinki young stroke registry, suggested that the prevalence of hypertension increased with increasing age and was seen in 28.3% of patients in the age group of 15-44 years. Smoking as a risk factor was observed in around 47% patients in both the age groups**.** It appears that risk factor profile becomes similar to older population with increase in age, the change becoming more apparent at around 44 years of age.177 subjects with the first ever ischemic stroke between the age ranges of 15-45 years were studied and it was found that 18% patients had hypertension, 7% had diabetes mellitus, 69% of males had a history of stroke and 17% had elevated cholesterol level.

High blood pressure is the biggest risk factor for stroke in younger and older adults. About 30% of people below the age range of 50 years have had a stroke. Diabetes is the second factor. An association between recent drinking and ischemic stroke in 16-40 year olds with no other none risk factors was also reported.

Neurological findings: Of the 52 participants, majority had a left MCA Infarct (79%) followed by hematoma (9%) and right MCA infarct and basal ganglia infarct (6%).

(0.0) Diagnosis of subjects: A detailed speech and language evaluation done during the first visit, showed that majority of the participants were diagnosed with Broca's aphasia (n=18) followed by Global Aphasia (16), Dysarthria with Dysphagia(n=10), Wernicke's aphasia(n=3), Conduction aphasia(n=2), Trans cortical motor aphasia(n=2),and Anomic aphasia(n=1).

Intervention - Language Therapy : The records of all the participants enrolled for the study were reviewed to get information on the language of intervention. As observed in the study, majority approached a SLP within the first 6 months post stroke all of them were in the spontaneous recovery period, and self-motivated. 3 reported for assessment between 6-12 months, 5 reported after 1 year and 10 reported after 2 years post stroke. Those who had come for assessment of language after 1 year or more had not come for therapy but with the intention of obtaining a certificate to get enrolled as physically handicapped so as to benefit from government facilities.

Whoever had come within 6 months of spontaneous recovery period were counseled for intensive language therapy for thrice a week session. Among the 52 participants, 22 enrolled for speech and language therapy. Though enrolled for therapy, they presented a varied attendance picture. Language intervention for 10 individuals had begun within 1 to 10 days after the assessment; 5 of them approached the SLP for treatment within 20 days, 2 of them within 30 days and one after 30 days.

Discussion

Stroke is one of the leading causes of mortality and morbidity worldwide. Stroke is a life changing event that affects not only the person who is disabled, but also his family and caregivers. A utility analysis shows that a major stroke is viewed by more than half of those at risk as being worse than death American Heart Association (2006).Globally stroke is the second leading cause of death Strong, Mathers and Bonita (2007). It is a disease that predominantly occurs in adults and elderly. Stroke is also a leading cause of functional impairment, with20% of survivors requiring institutional care after 3 months and 15% - 30% being permanently disabled Steinwachs, Collins-Nakai, Cohn, Garson and Wolk (2000).Age has the strongest association with the incidence of stroke. The age-specific incidence of stroke increases progressively with increasing age. The impact of stroke on the individual's family and society is strongest when it affects a young individual. The risk factors for stroke in Indian population are not different from the western or Southeast Asian population. However increased level of total cholesterol has been associated with ischemic stroke in young in most of the populations and it does not significantly differ from the Indian sub-continent Prasad and Singhal (2010). The traditional risk factors like hypertension, smoking and diabetes are associated with stroke in both young and elderly Olivares, Casaneda, Grife and Alter (1973), reported that hypertension, cardiac disease and diabetes mellitus are commonly cited as predisposing illness in stroke patients in the United States and the same predisposing condition emerged as common in the Mexican population. The present

study profiled stroke in young subjects who attended in the department of speech language studies for the period of 5 years. Outcome of the study revealed that younger men suffered (30%) a stroke when compared to women, 46(88%) had a sudden onset of stroke & 6(12%) of gradual onset, 5 with a positive family history of stroke and 7, reporting of other illness. Majority of them had completed graduation, followed by higher education, secondary education, post-graduation, middle schooling and primary education. The present study also revealed that majority of the participants was skilled followed by semi-skilled, unskilled, with the occupation details of 15 unavailable.A study by Tsutsumi, Kayaba, Kario and Ishikawa (2009) states that chronic stress associated with occupation is the risk factor for stroke which can be avoided or modified. Workers who face high psychological demands in their occupation and have little control over work are at a greater risk of becoming ill than the workers with low psychological demands and a high degree of control in their occupation. Possible mechanism through which job strain leads to stroke may include poor adaptation to stress, enhance sympathetic activation, and haemostatic or inflammatory condition. As observed in the study, occurrence of stroke related to single cause was found to be the most common among young individuals followed by those with aetiology related to 2 causes or 3 causes. The current study also showed the characteristics of stroke in young individuals such as gender preference, onset, education, nature of job and also aetiology as reported in other studies in the literature.

Conclusions

The present study focussed on profiling the characteristics of stroke in young individuals. In developing country like India, stroke in young individual is becoming a common phenomenon, because of the wider aetiological factors, young individuals are prone to get stroke. As a SLP, it is our duty to create public awareness and to treat the variety of communication and cognitive deficits that may result from stroke.

References

American Stroke Association. (2006). Primary Prevention of Ischemic Stroke: A Guideline from the American Heart Association/American Stroke Association Stroke Council. *Stroke, 37*, 1583-1633.

Banarjee, T., Roy, M., & Bhoi, K. (2005). Is stroke increasing in India- preventative measures that need to be implemented. *Journal of Indian Medical Association, 103*(3), 162-166.

Dalal, P., Bhattacharjee, M., Vairale, J., & Bhat, P. (2007). UN millennium development goals: can we halt the stroke epidemic in India? *Annals of Indian Academy of Neurology, 10,* 130-136.

Dalal, P., Malik, S., Bhattacharjee, M., Trivedi, N. D., Vairale,J., & Bhat, P. (2008). Population-based stroke survey in Mumbai, India: Incidence and 28-day case fatality. *Neuroepidemiology, 31,* 254-261.

Das, S., & Banerjee, T. (2008). Stroke Indian Scenario. *Circulation, 118,* 2719-2724.

Lee, T. H., Hsu, W. C., Chen, C. J.,& Chen, S. T. (2002) Etiologic study of young ischemic stroke in Taiwan. *Stroke, 33,* 1950-1955.

Nayak, S. D., Nair, M., Radhakrishnan, K., & Sarma, P. S.(1997). Ischemic stroke in the young adult: Clinical features, risk factors and outcome. *National Medical Journal of India 10,* 107-112.

Nedeltchev, K., der Maur, T. A., Georgiadis, D., Arnold, M., Caso, V., & Mattle, H. P. (2005). Ischemic stroke in young adults: Predictors of outcome and recurrence. *Journal of Neurology, Neurosurgery and Psychiatry, 76,* 191-195.

Olivares, L., Castaneda, E., Grife, A., & Alter, M. (1973). Risk factors in stroke : A clinical study in Mexican patients. *American heart association, 4,* 773-781.

Prasad, K., & Singhal, K. K. (2010). Stroke in young: An Indian perspective. *Neurology India, 58,* 343-50.

Putaala, J., Metso, A. J., Metso, T. M., Konkola, N., Kraemer, Y., & Haapaniemi, E. (2009). Analysis of 1008 consecutive patients aged 15 to 49 with first-ever ischemic stroke. *The Helsinki young stroke registry, 40,* 1195-203.

Sethi, P. (2002). Stroke-incidence in India and management of ischemic stroke. *Neuroscience, 4*(3), 139-141.

Shah, B., & Mathur, P. (2006). *Workshop Report on Stroke Surveillance in India. Division of NonCommunicable Diseases*, Indian Council of Medical Research, New Delhi.

Sridharan, S. E., Unnikrishnan, J. P., SajithSukumaran., Sylaja, P. N., Dineshnayak, S., Sarma, P. S., & Radhakrishnan, K. (2009). Incidence, types, risk factors and outcome of stroke in a developing country. *The Trivandrum Stroke Registry, 40,* 1212-1218.

Steinwachs, D. M., Collins-Nakai, R. L., Cohn, L. H., Garson, A., & Wolk Jr., M. J. J. (2000). The future of cardiology: utilization and costs of care. *American College of Cardiology, 35,* 91-98.

Strong, K., Mathers, C., & Bonita, R. (2007). Preventing stroke: saves lives around the world. *Lancet Neurology, 6,* 182-187.

Taylor, & Suresh Kumar, K. (2012). *Stroke in India factsheet,* 1-5.

Tsutsumi, A., Kayaba, K., Kario, K., & Ishikawa, S. (2009). Prospective Study on Occupational Stress and Risk of Stroke. *Archives of Internal Medicine, 169*(1), 56-61.