Socio-demographic characteristics of ischemic stroke patients in a tertiary care hospital of Nepal.

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ABSTRACT
Introduction: Incidence of stroke patients is increasing in low income countries like Nepal where management of these patients is challenging due to poor healthcare resources. Ischemic stroke is related to risk factors like age, male population, hypertension, diabetes mellitus, smoking and alcohol.3 Identification of these risk factors in the vulnerable population is important for prevention of ischemic stroke. The purpose of this study is to find out the social and demographic characteristics of patients with acute ischemic stroke treated at Upendra Devkota Memorial National Institute of Neurological and Allied Sciences, a tertiary care hospital of Nepal. **Methods:** Data was collected from all acute ischemic stroke patients presenting to the hospital over a period of one year. The age, sex, medical history of hypertension and diabetes and history of smoking and alcohol consumption were recorded. Statistical analysis of data was performed using Microsoft EXCEL 2019.**Result:** Total 310 patients were studied, out of which two-thirds were male. The highest number of patients were within the age group of 60-80 years with the mean age being 60 years. Hypertension and diabetes were present in 67.42% and 28.53% of patients respectively. 43.93% of the patients smoked while 33.87% of the patients consumed alcohol. **Conclusion:** Identification of association between risk factors like age, sex, hypertension, diabetes mellitus, smoking and alcohol consumption must be the emphasis for targeted preventive action to decrease the increasing burden of ischemic stroke among developing countries.
Key words: Brain ischemia, Epidemiology, Risk factors, stroke.

Introduction:

According to WHO, Stroke is defined as a "clinical syndrome consisting of rapidly developing clinical signs of focal (or global in case of coma) disturbance of cerebral function lasting more than 24 hours or leading to death with no apparent cause other than a vascular origin".[1] Stroke is currently the second leading cause of death worldwide.[2] Stroke can be classified as either hemorrhagic or ischemic. Ischemic stroke arises due to obstruction of the cerebral arteries resulting in ischemia in the territory of the occluded artery. Majority of the stroke around the world is due to ischemic stroke.[2] Globally, there are 67.5 million people living with ischemic stroke while 9.5 million new cases reported each year.[3] 60% of all new cases of ischemic stroke occur in people under 70 years with higher incidences in men than women. Ischemic stroke results in 2.7 million loss of lives each year.[3] The increasing incidence of stroke in

low income countries like Nepal is alarming.[2] In 2018, stroke resulted in 9.73% of all deaths. Nepal ranks 70 in the world for age adjusted death rate (86.87 per 100,000).[4] In countries like Nepal, where healthcare infrastructure is poor and resources are limited, managing the burden of stroke patients continues to be a challenge.

Behavioral factors are attributable to 2/3rd of the cases of ischemic stroke. High blood pressure is the single largest risk for ischemic stroke worldwide. Raised blood sugar is seen in almost 17.3% of stroke patients while risk factors like smoking and alcohol use is associated with 23.4% and 11.9% of stroke patients worldwide respectively.[5] Identification of the vulnerable population and risk factors with emphasis on prevention will decrease the incidence of ischemic stroke. But in countries like Nepal, association between risk factors and the disease is not extensively documented. The purpose of this study is to find out the social and demographic characteristics of patients with acute ischemic stroke in a tertiary care hospital of Nepal.

Methods:

This study was done in a tertiary care hospital in Nepal at Upendra Devkota Memorial National Institute of Neurological and Allied Sciences. Data was collected from all acute ischemic stroke patients presenting to the hospital over a period of 1 year (1st January 2018 to 1st January 2019). The diagnosis of ischemic stroke was made after Computed tomography (CT) scan or Magnetic Resonance Imaging (MRI) reporting by a radiologist and consultation with a neurologist. Patients without neuroimaging, old ischemic stroke cases and subtypes of stroke other than ischemic were excluded. The socioeconomic and demographic variables: age, sex, medical history of hypertension and diabetes and history of smoking and alcohol consumption were recorded.

Statistical analysis of data was performed using Microsoft EXCEL 2019.

Results:

Out of total 310 patients, 204 (65.25%) patients were male and 106 (34.75%) patients were female (Figure 1). The mean age of all patients was 60.73±16.27 years with the highest number of patients within the age group of 60-80 years (46.16%) followed by 40-60 years (32.56%) (Figure 2). The age of females ranged from 7 to 95 with a mean age of 61.9 ± 16.99 and that of males ranged from 13 to 96 with a mean age of 60.11 ± 15.9 years.
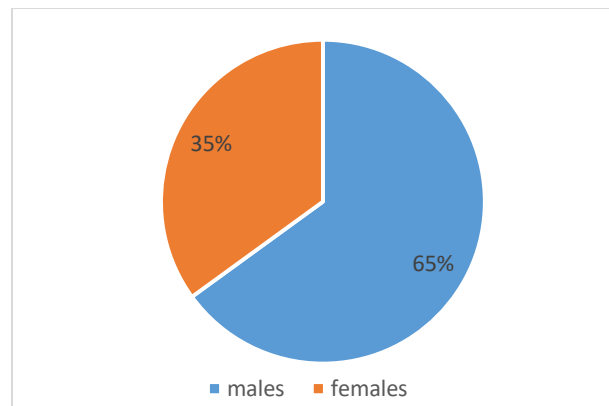

Figure 1: Sex distribution among ischemic stroke patients

The commonest risk factor was hypertension which was present in 67.42% (209) patients among which 66.99% (71) were females and 65.20% (138) were males. Diabetes was seen in 92 (28.53%) patients out of which 23 were females and 69 were males. Smoking was seen in 139(43.93%) patients among which 33 were females and 106 were males. Alcohol consumption was seen in 33.87% (105) patients out of which 19 were females and 86 were males. Hypertension as well as diabetes was seen in 20% (62) patients and smoking along with alcohol consumption was seen in 27.44% (85) patients.

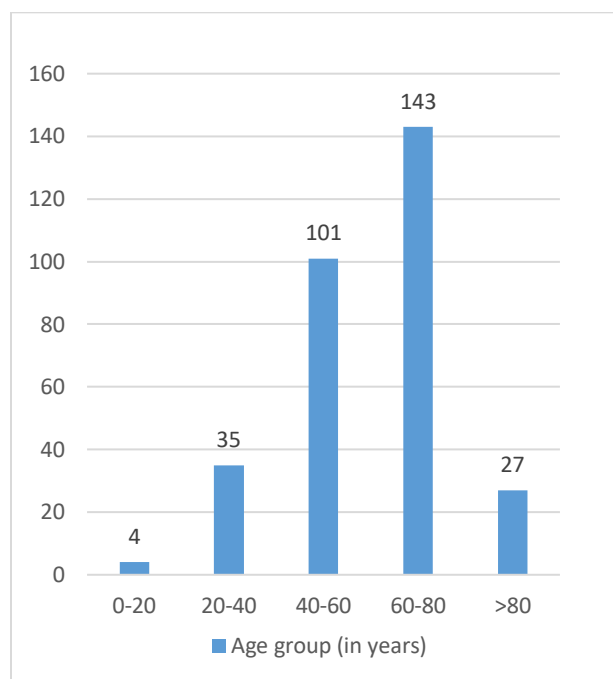All four risk factors were present in 22 patients out of which 4 were females and 18 were males (Figure 3).

Figure 2: Age distribution among ischemic stroke patients

Discussion:

Understanding the risk factors for ischemic stroke occurrence must be the priority for targeted preventive measures. Risk factors associated with ischemic stroke are age, male population, hypertension, diabetes mellitus, smoking and alcohol use. WHO has also reported increasing trends of stroke occurrence at a younger age.[2] The average age at which a person developed ischemic stroke in the present study was 60.73±16.27 years (Range 7-96 years). Lower mean age of stroke has also been reported in three previous Nepalese studies. Naik et al. reported a figure of 58.27 years (range 7-91 years) in their study.[5] Pathak et al. and Devkota et al. reports mean age as 61 years and 61.7±14.9 years respectively.[6,7] The mean age of stroke reported by Pathak et al.[7] However hypertension was present in much lower percentage of cases in other

in Asian subcontinent is reported as follows 66 (Mumbai, India), 52 to 66 years (Pakistan), 60 years Bangladesh) and 66 years (Srilanka). These values are lower in comparison to the western countries.[8-11]
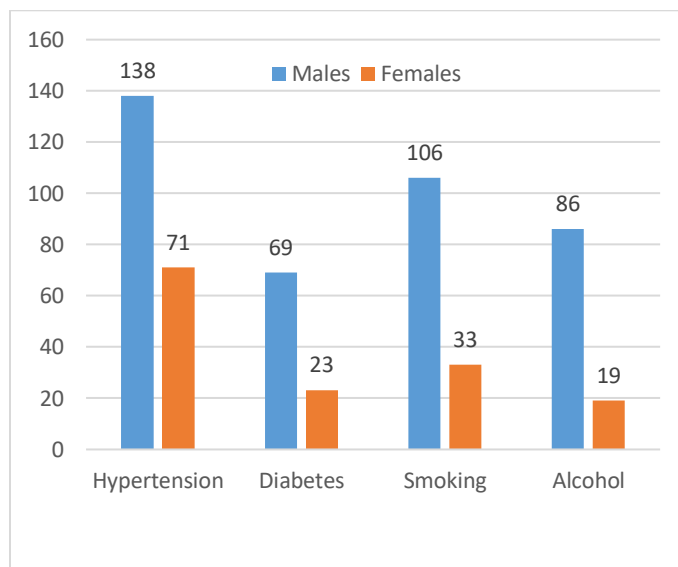

Figure 3: Risk factors of ischemic stroke

The maximum number of stroke patients were seen in age group 60 to 80 years followed by 40-60 years. 12% of the patients were under 40 years of age which is comparable to the WHO report of 10 % prevalence and 7% incidence of ischemic stroke occurring at age below 44 years.[3] Our study showed that stroke affected higher number of males 204 (65%) than females 106 (35%). The corresponding figures of another study in eastern Nepal were 69.3% and 30.7% respectively.[5] The findings of the above two studies are consistent with the global trend of male preponderance of stroke.[3]

Out of modifiable risk factors, hypertension was present in 209(67%) of cases and emerged as largest risk factor in our study. It was seen in 60% of cases in the series

Nepali studies (40% by Naiketal[5] and 47.2% by Devkota et al[6]). Higher values in our study may be attributed to

the fact that the incidence of hypertension is increasing in general. Hypertension is a major stroke risk factor in developed countries and was most common in South Asian and Western studies.[2]

Smoking ranked next to hypertension and was present in 139 (43%) cases in our study. It was reported in 61% and 58.3% of cases by Devkota et al[6] and Pathak et al[7] respectively which present smoking as a major risk factor of stroke in context of Nepal. History of alcohol consumption in excess of 500 ml for more than ten years was present in 105(33.8 %) of cases of stroke in our series. Alcohol consumption as a risk factor has been reported in 30.66% by Naiket al[5] and 18% by Pandit et al.[12] Diabetes Mellitus was present in 92(28.53%) of cases in our series. Similar lower figures of 6.6 %, 11% and 11.1% have been reported in other Nepali studies by Naik et al[5], Devkota et al[6] and Pandit et all[13] respectively.

Conclusion:

The understanding of social and demographic characteristics in stroke patients is important in order to understand the population at risk and address the risk factors. The present study aims to present the socio-demographic picture of patients with ischemic stroke in a developing country like Nepal. The study shows higher incidences of stroke in males than females with the majority cases in the age group 60-80 years followed closely by 40-60 years. Hypertension was found to be the commonest risk factor. Understanding these variables will help to formulate preventive action plans to specific risk factors and targeted population groups.

References:

1. Aho K, Harmsen P, Hatano S, Marquardsen J, Smirnov VE, Strasser T. Cerebrovascular disease in the community: results of a WHO collaborative study. Bull Worlh Health Organ. 1980;58 (1), 113-30. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2395897/pdf/bullwho00424-0120.pdf.

2. Johnson W, Onuma O, Owolabi M, Sachdev S. Stroke: a global response is needed. Bull World Health Organ. 2016;94(9):634-634A. https://doi:10.2471/BLT.16.181636.

3. Lindsay MP, Norrving B, Sacco RL, et al. World Stroke Organization (WSO): Global Stroke Fact Sheet 2019. Int J Stroke. 2019;14(8):806-17. https://doi:10.1177/1747493019881353.

4. World Life Expectancy. 2020. Life Expectancy in Nepal. Available at: https://www.worldlifeexpectancy.com/nepal-life-expectancy [Accessed 01 August 2020].

5. Naik M, Rauniyar RK, Sharma UK, Dwivedi S, Karki DB, Samuel JR. Clinicoradiological profile of stroke in eastern Nepal, a computed tomography study. Kathmandu Univ Med J 2006;4(2):161-6. Available from: https://www.kumj.com.np/issue/36/244-247.pdf.

6. Devkota KC, Thapamagar SB, Malla S. Retrospective analysis of stroke and its risk factors at Nepal Medical College Teaching Hospital. Nepal Med Coll J. 2006 Dec;8(4):269-75. Available from: https://pdfs.semanticscholar.org/aac4/db07a6908742160fb41b3eec58cd44a08650.pdf.

7. Pathak V, Kanth R, Pant. Stroke: A case series in Nepal Medical College Teaching Hospital. Nepal med coll J 2006;8(3):180-1. Available from https://pubmed.ncbi.nlm.nih.gov/17203825/.

8. Pandian JD, Sudhan P. Stroke epidemiology and stroke care services in India. J Stroke. 2013 Sep;15(3):128-34. https://doi: 10.5853/jos.2013.15.3.128.

9. Khealani BA, Hameed B, Mapari UU. Stroke in Pakistan. J Pak Med Assoc. 2008;58(7):400-3. Available from: https://jpma.org.pk/PdfDownload/1444.

10. Bhowmik NB, Abbas A, Saifuddin M, Ismam MR, Habib R, Rahman A, et al. Ischemic Strokes: Observations from a Hospital Based Stroke Registry in Bangladesh. Stroke Res Treat. 2016;2016:5610797. https://doi:10.1155/2016/5610797.

11. Kariyawasam PN, Pathirana KD, Hewage DC. Factors associated with health related quality of life of patients with stroke in Sri Lankan context. Health Qual Life Outcomes. 2020;18(1):129. https://doi:10.1186/s12955-020-01388-y.

12. Pandit A, Arjyal A, Farrar J, Basnyat B. Nepal. Practical Neurology. 2006;6:129-33. https://doi:10.1136/jnnp.2006.089060.