ORIGINAL RESEARCH PAPER

Volume-6 | Issue-10 | October-2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A STUDY OF RISK FACTORS OF STROKE PATIENTS ADMITTED IN TERTIARY CARE TEACHING HOSPITAL IN EASTERN NEPAL: A RETROSPECTIVE STUDY

Medicine

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ABSTRACT

Background: Stroke is a state of non-convulsive, focal neurological deficit of abrupt onset usually caused by ischemic infarction or hemorrhage in the brain. It is third highest cause of death in developed countries and is the most disabling of all neurological diseases. Nearly one third of stroke patient die within weeks and 48% die within one year. .It is a global health problem and is a leading cause of adult disability

The Framingham profileconsisting of elevated systolic blood pressure, elevated serum cholesterol level, glucose intolerance, cigarette smoking and different heart disease like left ventricular hypertrophy identifies persons at highest risk of stroke.

Objectives: To study the risk factors of stroke in adult patients.To know the epidemiological profileanddemography factors of stroke patients.

Methods: After ethical clearance, A total 276 discharged file of stroke patients were retrospectively studied from January 2016 to December 2016 with the help of self-designed questionnaire to detect epidemiological profile, demography profile and risk factors of stroke patients. Diagnosis of stroke was confirmed by CT scan of brain.Collected data were entered in Microsoft excel 2007 and converted it into SPSS for statistical analysis.

Results: The maximum occurrence of stroke was seen in patients > 60 years. It showed higher percentage of males 180 (65%) than females 96 (35%). Other conventional modifiable risk factors were seen as follows: 195(71. %) were hypertensive, 55(20%) were diabetics: 16(5.8%) had Dyslipidemias, 163(59.1%) were cigarette smoker, 169(61.2%) were alcohol consumer, 22.6% had history of different types of heart disease. Analysis of stroke subtypes showed preponderance of haemorrhagic stroke in 158 (57.2%) as against infarction in 118 (42.8%) of cases. Out of 158 haemorrhagic stroke patients, 44(16%) had Intraventricular extension.

Regarding outcome of stroke patients: 175(63.4%) were discharge from ward, 33(12%) were operated,10(3.6%) had notoperated, 14(5.1%) went on LAMA, 12(4.3%) had ICU admissionand 7(2.5%) had mortality.

Conclusion: The maximum occurrence of stroke was seen in patients > 60 years. Overall male preponderance and higher occurrence of haemorrhagic stroke was seen in our study. Significant risk factors in order of descending order were hypertension, alcohol use, cigarette smoking, diabetes, dyslipidaemia, different heart disease.Understanding exact etiology and planning preventive strategies can reduce future stroke burden for developing country like Nepal.

KEYWORDS

haemorrhagic stroke, ischaemic stroke, risk factors

INTRODUCTION

Stroke or cerebrovascular accident (CVA) is an acute neurological injury secondary to cerebrovascular disease, either by infarction (80%) or by haemorrhage (20%). It is a state of non-convulsive, focal neurological deficit of abrupt onset usually caused by ischemic infarction or hemorrhage in the brain.It is third highest cause of death in developed countries and is the most disabling of all neurological diseases. Nearly one third of stroke patient die within weeks and 48% die within one year. Diagnosis of the cause of TIAs with appropriate management is important in order to prevent a potentially devastating stroke.The Framingham profileconsisting of elevated systolic blood pressure, elevated serum cholesterol level, glucose intolerance, cigarette smoking and different heart disease like left ventricular hypertrophy identifies persons at highest risk of stroke.

Increased Serum levels of total cholesterol, Triglycerides, Low density lipoprotein (LDL-C) and low serum levels of High density lipoprotein (HDL-C) are associated with increased risk of ischemic stroke. and also poorer prognosis.

Low fruit and vegetable intake: *Fruit* and vegetable consumption is one element of a healthy diet. Insufficient intake of fruit and vegetables is esti¬mated to cause around 14% of gastrointestinal can¬cer deaths, about 11% of ischaemic heart disease deaths and about 9% of stroke deaths worldwide. Most of the benefit of consuming fruits and vegeta¬bles comes from reduction in cardiovascular disease, but fruits and vegetables also prevent cancer.

Global patterns of health risk: The five leading global risks for mortality in the world are high blood pressure, tobacco use, high blood glucose, physical inactivity, and overweight and obesity. They are responsible for raising the risk of chronic diseases likestroke;they affect all countries across the world. Globally, 6% of deaths are caused by high blood glucose, with 83% of those deaths occurring in cause of disability. Globally, 44% of diabetes burden, 23% of ischaemic heart disease burden.

Stroke is the second most leading etiology of death all over the world. Cerebral infarction of 'unknown etiology' represents about 40% of cases in the stroke and the importance of potential precipitants has not been well documented.

Stroke is a global health problem and is a leading cause of adult disability. Driven by increasing size and aging of populations, and escalating prevalence of risk factors such as hypertension, tobacco use, unhealthy diet, physical inactivity, and obesity, stroke is becoming a major cause of premature death and disability in developing countries like ours.

About 60% to 80% of all ischemic strokes can be attributed to increasing blood pressure, blood cholesterol, cigarette smoking, carotid stenosis, and diabetes mellitus and atrial fibrillation and valvular heart disease (cardiogenic ischemic stroke).

MATERIALS AND METHODOLOGY

After ethical clearance, a total 276 discharged file of stroke patients were retrospectively studied from January 2016 to December 2016.Discharged file sheets was thoroughly studied to detect epidemiological profile, demography profile and risk factors of stroke patients.Diagnosis of stroke was confirmed by CT scan of brain.

Collected data were entered in Microsoft excel 2007 and converted it into SPSS for statistical analysis. Descriptive statistical like mean, median, SD, IQR, percentage were calculated along with graphical and tabular presentation. For inferential statistics, chi square Test were applied to find out the significant between dependents and other related variables at 95% CI, where p= 0.05.

RESULTS

Out of 276 discharged file of strokepatients. The mean age of stroke patients was more than 60.01 years and male (65 %). Most of them were the Hindu (88%), Brahmin (21%) ethnicity, non-vegetarian 253(91.7%), 118(43%) from sunsari district), 61.2% admitted in summer season dominated the sample.

Regarding modifiable risk factor, 163(59 %) were smoker, 169(61%) alcohol consumer, 195(71%) hypertensive, 55(20%) diabetics and 16(5.8%) had Dyslipidemias, 23 % had history different types of heart disease, Out of 276 discharged file of stroke patients, 61(22%) had history of chronic Medical disease, 51(19%) evidence of target organ damage, 32 (12 %) under medication of anti-coagulant drug use. Regarding types of stroke, haemorrhagic stroke were seen in 158 (57 %) whereas as infarction in 118 (43 %). Out of 158 haemorrhagic stroke patients, 44(16%) had intraventricular extension.

Regarding outcome: 175(63.4%) were discharge from ward, 33(12%) were operated.10 (4 %) not operated, 14(5 %) went on LAMA, 12(4.3%) ICU admission, and 7(2. 5%) had Mortality

Out of 276 stroke patients, 43% from sunsari district, 15% from Morang and 10% from Dhankuata

Table. 1: Distribution of district.

	Frequency	Percent
Sunsari	**118**	**42.8**
Dhankuta	**26**	**9.4**
Morang	**42**	**15.2**
Jhapa	**14**	**5.1**
Saptari	**16**	**5.8**

Out of 276 stroke patients, 59(21.4%) were farmer, 19.2% were housewife, 10.5% were laborer, (10.1%) were businessman

Table No. 2 Occupation:

	Frequency	Percent
Farmer	59	21.4
Service	11	4.0
Business	28	10.1
Laborer	29	10.5
Others	82	29.7
Housewife	53	19.2

Most of stroke admitted in summer season 61.2%, 33% admitted in winter season 6% admitted in rainy season.

Table No. 3 Seasonal Variation:

	Frequency	Percent
Winter	81	33.1
Summer	150	61.2
Rainy	14	5.7
Missing System	31	

Out of 276 stroke patients, male were 180(65%) and female were 96(35%)

Table No. 4 Sex:

	Frequency	Percent
Male	**180**	**65.2**
Female	**96**	**34.8**

Regarding Ethnicity, 21% were Brahmin, 19.2% were Rai, 10.1% were chhetri and 9.8% were Magar.

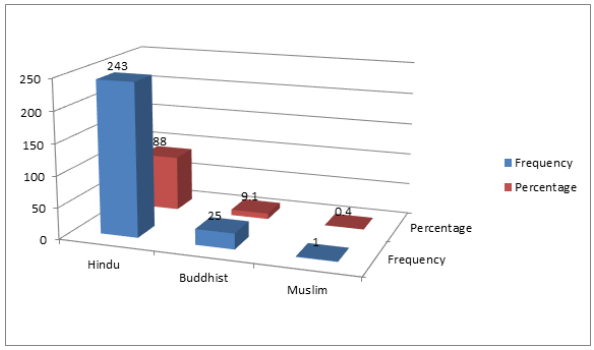
Table No. 5 Ethnicity:

	Frequency	Percent
Brahmin	57	20.7
Chhetri	28	10.1
Newar	20	7.2
Rai	53	19.2
Magar	27	9.8

Regarding religion: 243(88%) were Hindu and 25 (10%) were Buddhist whereas 2.5% were kirat

Table No. 6 Religion

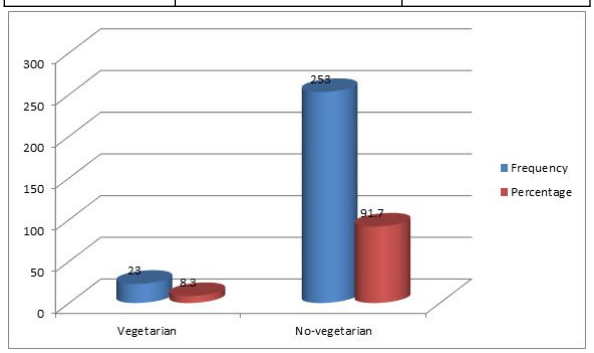
	Frequency	Percent
Hindu	243	88.0
Buddhist	25	9.1
Muslim	1	.4
Kirat	7	2.5



Regarding Dietary habbit, 253(91.7%) were non-vegetarian whereas 8.3% were vegetarian

Table No. 7 Dietary Habbit

	Frequency	Percent
Vegetarian	23	8.3
Non-vegetarian	253	91.7



Regarding cigarette habbit, 163(59.1%) were smoker whereas 113(41%) were non smoker

Table No. 8 Cigarette

	Frequency	Percent
Yes	163	59.1
No	113	40.9

Regarding alcohol habbit, 169(61.2%) were alcohol consumer whereas 107(38.8%) were non-alcohol consumer

Table No. 9 Alcohol

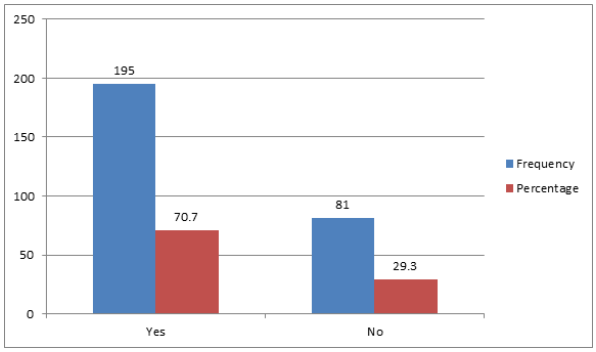
	Frequency	Percent
Yes	**169**	**61.2**
No	**107**	**38.8**

Out of 276 stroke patients: 195(70.7%) were hypertensive whereas 81(29.3%) were non hypertensive patients

Table No. 10 Blood Pressure

	Frequency	Percent
Yes	195	70.7

No	81	29.3



Out of 276 stroke patients: 55(20%) were diabetics whereas 221(80.1%) were non diabetics

Table No. 11 Diabetes

	Frequency	Percent
Yes	55	19.9
No	221	80.1

Out of 276 stroke patients: 16(5.8%) had Dyslipidemias whereas 260(94.2%) had not Dyslipidemias

Table No. 12 Dyslipidemias

	Frequency	Percent
Yes	16	5.8
No	260	94.2

Regarding Anti-coagulant drug use: 32 (11.6%) had history of anti-coagulant drug use whereas 213 (77.2%) had not history of anti-coagulant drug use

Table No 13 Anti-coagulants drug use

	Frequency	Percent
Yes	32	11.6
No	213	77.2
Missing System	31	11.2

Regarding heart disease: Out of 276 stroke patients: 23% had history different types of heart disease:

Table No. 14 History of different types of heart disease: Atrial fibrillation

	Atrial fibrillation	Heart failure	Mitral Stenosis	Prosthetic heart valve	Infective endocarditis	Recent myocardial infarction	Left ventricular aneurysm
Yes	30(11%)	22(8%)	4(1.4%)	1(o.4%)	1(o.4%)	1(o.4%)	3(1.1%)
No	246(89%)	254(92%)	272(98.6%)	275(99.6)	275(99.6)	275(99.6)	272(98.9)

Regarding history of seizure: 29(10.5%) had history of seizure whereas 247(89.5%) had not of seizure

Table No. 15 History of seizure

	Frequency	Percent
Yes	29	10.5
No	247	89.5

Regarding evidence of target organ damage: 51(18.5%) had evidence of target organ damage whereas 225(81.5%) had no evidence of target organ damage

Table No. 16 Evidence of target organ damage

	Frequency	Percent
Yes	51	18.5
No	225	81.5

Table No. 17 Bowel/Bladder involvement

	Frequency	Percent
Yes	47	17.0
No	229	83.0

Regarding chronic Medical disease: 61(22,1%) had history of chronic Medical disease whereas 215(80%) had not history of chronic Medical disease

Table No. 17 Chronic Medical disease

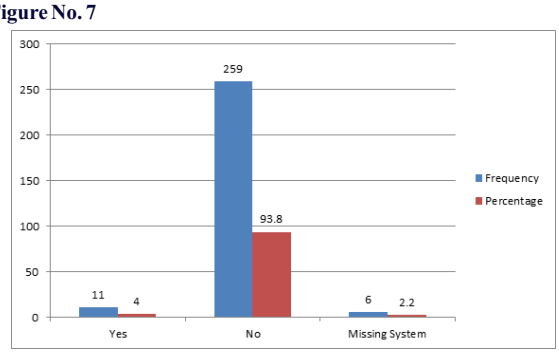
	Frequency	Percent
Yes	61	22.1
No	215	77.9

Regarding Surgical Disease: 11(4%) had history of Surgical Disease whereas 259(94%) had not history of Surgical Disease

Table No. 18 Surgical Disease

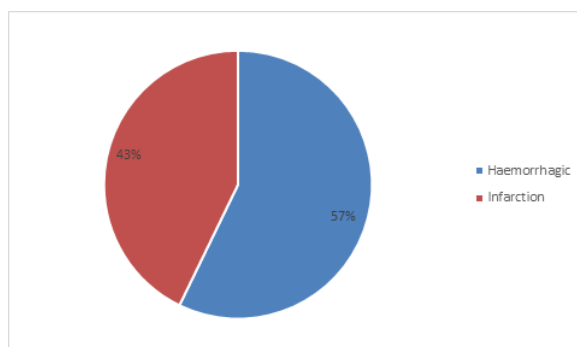
	Frequency	Percent
Yes	11	4.0
No	259	93.8
Missing System	6	2.2

Figure No. 7



- Analysis of stroke subtypes showed preponderance of haemorrhagic stroke in 158 (57.2%) as against infarction in 118 (42.8%) of cases.
- Out of 158 haemorrhagic stroke patients, 44(16%) had intraventricular extension

	Haemorrhagic	Infarction
No.	158 (57.2%)	118 (42.8%)



Regarding Intraventricular extension: 44(16%) had Intraventricular extension whereas 158(84.1%) had not Intraventricular extension

Table No. 19 Intraventricular extension

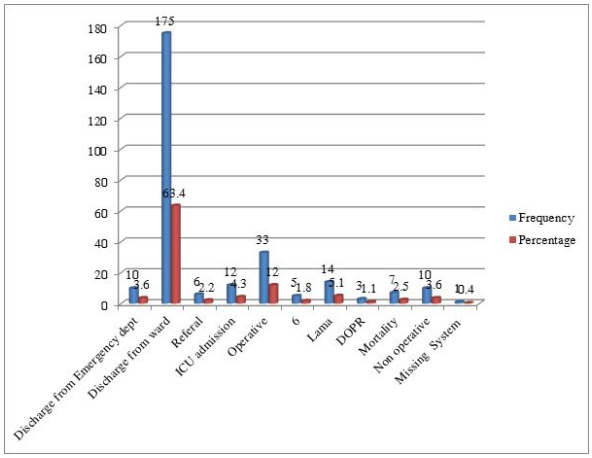
	Frequency	Percent
Present	44	15.9
Absent	158	84.1

Figure No. 10

Regarding outcome: 175(63.4%) were discharge from ward, 33(12%) were operated. 14(5.1%) went on LAMA, 12(4.3%) ICU admission, 10(3.6%) had Non operated and 7(2,5%) had Mortality

Table No. 20 Outcome

	Frequency	Percent
Discharge from Emergency department	10	3.6
Discharge from ward	175	63.4
Referral	6	2.2
ICU admission	12	4.3
Operative	33	12.0
Lama	14	5.1
DOPR	3	1.1
Mortality	7	2.5
Non operative	10	3.6
Missing System	1	.4



DISCUSSION

Stroke is an acute neurological injury secondary to cerebrovascular disease, either by infarction (80%) or by haemorrhage (20%). It is a state of non-convulsive, focal neurological deficit of abrupt onset usually caused by ischemia infarction or hemorrhage in the brain1,5 Cerebrovascular disease is third highest cause of death in developed countries and is the most disabling of all neurological diseases. Nearly one third of stroke patient die within weeks and 48% die within one year1, 2, 4.

High mortality in stroke is due to some complications like cerebral edema and brainstem herniation; infection, metabolic disorder, electrolyte imbalance and associated heart disease.3, 4The Framingham profile consisting of elevated systolic blood pressure, elevated serum cholesterol level, glucose intolerance, cigarette smoking and different heart disease like left ventricular hypertrophy identifies persons at highest risk of stroke.1, 4

Details assessment of its underlying risk factors in 4stroke population of a country is relevant to understanding etiology and planning preventive strategies to reduce future stroke burden. There are limited studies available on the subject in Nepal .2-3
Out of 276 discharged file of stroke patients. The mean age of stroke patients was 60.01 years. Most of the subjects were male (65 %), non-vegetarian, 61 % admitted in summer season.

Regarding modifiable risk factor, 163(60 %) were smoker, 169(61%) alcohol consumer, 195(71%) hypertensive, 55(20%) diabetics and 16 (6 %) Dyslipidemias, 23 % had history different types of heart disease.

Regarding types of stroke, haemorrhagic stroke were seen in 158 (57 %) whereas as infarction in 118 (43 %). Out of 158 haemorrhagic stroke patients, 44(16%) had intraventricular extension.

Regarding outcome: 175(63.4%) were discharge from ward, 33(12%) were operated.10(4 %) not operated, 14(5.1%) went on LAMA, 12 (4.3%) ICU admission, and 7(3 %) had Mortality

Stroke is a global health problem and is a leading cause of adult disability. stroke was responsible for 5.7 million (16.6%) deaths, and 87% of these deaths occurred in low-income and middle-income counties.4 Driven by increasing size and aging of populations, and escalating prevalence of risk factors such as hypertension, tobacco use, unhealthy diet, physical inactivity, and obesity, stroke is becoming a major cause of premature death and disability in developing countries like ours.5 This prompted the World Health Organization (WHO) to launch the Global Stroke Initiative aimed to generate population based data on burden of stroke and to use such data to evolve strategies for prevention and management.6 The feasibility of WHO STEPS Stroke Surveillance System (STEPS Stroke),7 which provides a standardized approach to stroke data collection, analysis, interpretation, and dissemination, has been successfully tested in several developing countries like Nepal8, with more than 1 billion inhabitants, is undergoing remarkable economic and demographic changes in recent years resulting in a transition from poverty-related infectious and nutritional deficiency diseases toward lifestyle-related cardiovascular and cerebrovascular diseases.9,10Despite rapid economic boom, a large segment of the Nepal population still lives in poverty. Given the anticipated increase in burden of stroke in coming years and limited availability of organized stroke care services to the majority of people in Nepal, it would be logical to place greater emphasis on population based stroke prevention strategies. However, very little reliable information is currently available regarding epidemiology of stroke in Nepal. The reported frequency, pattern, risk factors, and outcome of stroke from India and Nepal are largely derived from hospital-based observations.10,11 Very few epidemiological studies on stroke that are available from India and Nepal12-14 do not fulfill the criteria for an ideal study of stroke incidence.15

Infections complicating acute ischemic stroke contribute to mortality and poor functional outcome after stroke in most clinical studies 16–21. Pneumonia occurs in 5–22% and is the most common cause of death in stroke patients 16–23. The risk of infection is highest in the acute phase after stroke 19 which may be attributed to stroke-induced immunodepression syndrome (SIDS). SIDS is characterized by loss of lymphocytes through apoptosis, shift of T-helper cell 1 to 2 cytokine productions, decreased monocyte count and function, and interferon γ deficiency which begins a few hours after ischemia and lasts for several weeks. These effects are associated with infection after stroke 24 25. Biomarkers may facilitate an early diagnosis of infection in patients with acute ischemic stroke 26.

Risk Factors for Ischemic Stroke: Increasing blood pressure, increasing blood cholesterol, carotid stenosis, and atrial fibrillation are definite risk factors for ischemic stroke because randomized controlled trials (RCTs) have shown that treating them reduces the incidence of ischemic stroke.28-32

CONCLUSION:

Stroke is a global health problem and is a leading cause of adult disability. It is becoming a major cause of premature death and disability in developed country and developing countries like ours and is the most disabling of all neurological diseases.

Early diagnosis and treatment of modifiable risk factors can reduce mortality and morbidity from stroke. Understanding exact etiology and planning preventive strategies can reduce future stroke burden for poor country like Nepal. So, Diagnosis of stroke/TIA with appropriate management is important in order to prevent a potentially devastating stroke.

LIMITATION:

As it is a retrospective study, some of the important findings in discharge files were foundmissing. So strength of the study has been found limited and compromised. Time constraint was another limitation of the study.

RECOMMENDATION:

Suitable measures to reduce the stroke risk can be adopted with execution of primary and secondary prevention strategies. Understanding the role of these risk factors is key to develop a clear and effective strategy for improving health of the people our country.

Identification of its modifiable risk factors can help us in planning preventive strategiesto reduce future stroke burden.

Health awareness about stroke risk factors minimization will be disseminated in general population. Public awareness about ill effects of cigarette smoking and excessive alcohol use contribute in reduction of stroke burden.

The result of the study would be helpful in correcting the existing problems for decreasing stroke prevalence in our society.

ACKNOWLEDGEMENT

I take this opportunity to express my sincere gratitude to respected teacher Dr Gyanendra Bahadur Malla, professor of General practice and Emergency Medicine. My heartfelt gratitude also goes to Dr Surya Raj Niraula, Dr Rabin Bhandari and my colleagues Dr Vijay shrivastav, Dr Mahesh shah and Dr Alok Kumar, department of general practice and emergency medicine.

I thank Meena Rai for helping me computer work and statistical evaluation. I also thank the institute for permitting research work to do.

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