Neurology

STUDY OF RISK FACTORS OF STROKE - AN OBSERVATIONAL STUDY IN THE RURAL MEDICAL COLLEGE IN NORTH WEST OF INDIA.

Dr. Girish Kumar	Department of Pediatrics DRKGMC Hamirpur Himachal Pradesh.
Dr. Amit Bhardwaj	Department of neurology DRPGMC Kangra at Tanda Himachal Pradesh.
Dr. Vandana Sharma*	Department of Anatomy DRKGMC Hamirpur Himachal Pradesh. *Corresponding Author

ABSTRACT **Introduction:** -Stroke is the leading cause of mortality and physical disability among the all neurological diseases. Risk factors, type, and incidence varies in different population. With this study we intend to evaluate the profile of patient, and prevailing management of stroke patients in rural Medical College in North West India. **Material methods:** -All the stroke patients presenting to emergency department were included in the study. Demographic profile, stroke types, risk factors were recorded for each stroke patient. **Results:** -Among a total of 124 patients 78 were male and 46 female. Mean systolic blood pressure was 155 and mean diastolic blood pressure of 91 mm of Hg. Ischemic stroke accounted for 73.4% and haemorrhagic stroke for 26.6 %. Hypertension was found in 47 % of ischemic patients and 51 % haemorrhagic strokes patients. Diabetes was found in 28.6 % of ischemic stroke patients and 24.4% of haemorrhagic stroke patients. Dyslipidaemia in 3.3% of ischemic and 9 % of haemorrhagic stroke patients. 34% of ischemic and 33% of haemorrhagic stroke patients were smoker. 8.8% of ischemic stroke patients had past history of stroke and CAD while only 6% haemorrhagic stroke patients had past history of stroke and none of haemorrhagic strike patient had history of CAD. **Conclusion: -** Undiagnosed and untreated hypertension and lack of awareness of the risks factors are some of the areas of concern.

INTRODUCTION:

Stroke is among the most devastating of all neurological diseases, presenting with high rate of mortality and gross physical impairment worldwide.[1] For the last two decade the number of stroke survivors and a global burden of stroke has increased due to population growth, aging, improved stroke care, and increased prevalence of modifiable risk factors, although, overall stroke incidence, mortality, and disability-adjusted life years [DALYs] rate have declined due to improvement in health care system and treatment options.[2]

Nine tenths of global burden of stroke is due to modifiable risk factors.[3] Various modifiable risk factors of stroke are behavioural factors including diet, environmental and occupational factors including ambient particulate matter pollution, household air pollution from fossil fuel, and metabolic factors including high blood pressure, high fasting blood sugar, high total cholesterol, high BMI, low glomerular filtration rate.[4] There is variation in the frequency of different types of stroke, risk factors ,incidence in different regions of world. [5,6]

We intend to report our experience of stroke patient treatment profile and efficiency of the prevailing system of management of stroke patients in rural Medical College in North West India.

MATERIAL METHODS
Study design and participants

This is a prospective study carried on all the stroke patients admitted in the tertiary care centre in a rural North-west India.

Details of the procedure

Data of all the patients were collected by the stroke nurse who was trained stroke care and had done NIHSS score training. Data was entered in the preform for evaluation. Where ever any difficulty or any discrepancy data were checked by the investigator. Demographic and basic profile of each patient was recorded.

Risk factors of stroke like hypertension, diabetes, dyslipidaemia, smoking, alcohol, previous history of stroke, coronary artery disease (CHD), history of rheumatic heart disease (RHD) were recorded for each patient. In addition to the risk factors details regarding the mean of transportation, awareness regarding stroke, time of onset, duration of deficit at presentation to hospital, time taken for computerize tomography (CT) scan, and where ever applicable time taken to start thrombolysis were recorded. Pre hospital and in hospital delay in management of patient was determined for each patient. Blood pressure, pulse rate, and its characters, especially irregularity of pulse and blood glucose at the time of presentation was determined at presentation.

RESULTS
Table -1 Basic Parameters

	Parameter	Mean ±SD
1	Age	63.55(13.90)
2	Height	155.66(15.81)
3	Weight	59.36(10.38)
4	Systolic BP	155.14(30.75)
5	Diastolic BP	91.21(16.59)
6	Time deficit to hospital	548.14(1512.33)
7	Time hospital to CT done	105.35(214.46)
8	Male	78(63%)
9	Female	46(37%)

124 patients were studied, 78(63%) were male and 46(37%) female. The mean age of all stroke patients was 63.5 years and mean height of 155 cm and weight of 59.3 kg. Mean systolic blood pressure was 155 and mean diastolic blood pressure of 91 mm of Hg. The mean time of delay to reach hospital was 548 minutes and delay in CT head after hospital admission was 105 minutes. Table -1

Among the all strokes patients' ischemic stroke accounted for 73.4% and haemorrhagic stroke 26.6 % with mean age of 65 years and 58 years. The mean tine delay to reach hospital was 546 in ischemic and 553 minutes in haemorrhagic strokes patients. Table-2

Table-2 Comparison of Haemorrhagic and Ischemic strokes

S. No	Parameters		Haemorrhage No (Percentage)	Ischemic No (Percentage)	Chi –Square; P value
1	No of Patients		33 (26.6)	91(73.4)	124; 0.00
2	Age	Mean ±SD	58.15 (13.49)	65.516 (13.60)	
3	Sex	Male	22(66.7)	56(61.5)	0.27;0.61
		Female	11(33.3)	35(38.5)	
4	Time- deficit to hospital Mean ±SD		553.93	546.04	
5	Education	Uneducated	5(15)	19(20)	10.52; 0.06
		Can write name	8(24)	28(30)	
		Primary	1(3)	14(15)	
		Matric	10(33.3)	21(23)	
		Secondary	6(18)	4(4.3)	
		College level	3(9)	5(5.4)	

In ischemic stroke patients 47 % were hypertensive and in haemorrhagic strokes 51 % were hypertensive out of which 81% of ischemic and 79 % of haemorrhagic patients were not taking antihypertensive treatments regularly. Diabetes was found 28.6 % of ischemic stroke patients and 24.4% of haemorrhagic stroke patients. Dyslipidaemia was found in 3.3% of ischemic and 9 % of haemorrhagic stroke patients. 34% of ischemic and 33% of haemorrhagic stroke patients were smoker. History of alcohol consumption was found in 22% of ischemic stroke patients and 30% of haemorrhagic stroke patients. 8.8% of ischemic stroke patients had past history of stroke and CAD while only 6% haemorrhagic stroke patients had past history of stroke and none of haemorrhagic strike patient had history of CAD in the past. 35.2% of ischemic patients and 48.5% haemorrhagic patients used 108 ambulance and 39.5% of ischemic patients and 36.4% of haemorrhagic patients used private vehicle to reach hospital for treatment. Table-3

Table -3 Risk factors of stroke in Haemorrhagic and Ischemic strokes

S.No		HAMORRAGE	INFRACTION	Chi-Square value
1	Awareness which part of body involved			
	Knows	1(3.1)	2(2.1)	0.071; 0.79
	Does not know	32(96.9)	89(97.8)	
2	Awareness what is the cause			
	Knows	1(3.1)	1(1.1)	0.56; 0.45
	Does not know	32(96.9)	90(98.9)	
3	HTN			
	Nil	16(48.5)	48(52.7)	0.20;0.90
	Newly diagnosed	1(3)	3(3.3)	
	On treatment	16(48.5)	40(44)	
4	HTN treatment			
	Regular treatment	7(21)	17(18.6)	0.09;0.75
	Irregular treatment	26(79)	74(81.4)	
5	DM			
	Nil	25(75.7)	65(71.4)	0.40;0.81
	Newly diagnosed	1(3)	5(5.6)	
	On treatment	7(21.3)	21(23)	
6	DISLIPIDEMIA			
	Yes	3(9)	3(3.3)	2.66;0.26
	No	16(48.5)	38(41.8)	
	Not known	14(42.5)	50(54.9)	
7	If Yes- on statins			
	Yes	0	2(2.2)	0.73; 0.39
	No	33(100)	89(87.8)	
8	SMOKING			
	Yes	11(33.3)	31(34)	0.006; 0. 93
	No	22(66.7)	60(66)	
9	ALCOHAL			
	Yes	10(30)	20(22)	0.91; 0.33
	No	23(70)	71(78)	
10	PAST H/O STROKE			
	Yes	2(6)	8(8.8)	0.24; 0.62
	No	31(94)	83(91.2)	
11	PAST H/O CAD			
	Yes	0	8((8.8)	3.10; 0.07
	No	33(100)	83(91.2)	
12	FAMILY HISTORY			
	Yes	0	5(5.5)	1.88; 0.16
	No	33(100)	86(94.5)	
13	Vehicle			
	Self-vehicle	12(36.4)	36(39.5)	2.39; 0.49
	Public transport	4(12.1)	20(22)	
	108 ambulance	16(48.5)	32(35.2)	
	Other ambulance	1(3)	3(3.3)	
14	IMAGING CT Head			
	Normal	0	32(35.2)	15.64; 0.00
	Abnormal	33(100)	59(64.8)	

whereas in rest of country the ratio is lower and to be vary1.86:1 - 2.21:1[7,8] this indicates that haemorrhagic strokes were less in this part compared to the rest of country. There are other hospital based studies in Addis, Abeba, Ethiopia where ischemic to haemorrhagic ratio of as low as 1.58[9], 0.63[10] and 1.33[11], and in one study in Gondar Ethiopia found higher ratio of 2.27[12]. Ischemic to haemorrhagic is much higher 7.3:1 in western countries.

The ratio of the ischemic to haemorrhage increases as the age increases and the mean age of ischemic stroke patients was higher than haemorrhagic stroke patients but male to female ratio was higher in the haemorrhagic patients.

Age is one of the important non-modifiable risk factor and in our study, mean age of all stroke patients were 63.5 years which was lower than that in the Western countries (65 in USA and 71 in Italy) this may be because of the poor control of modifiable risk factors.[13] In our study systolic blood pressure at the time of presentation was found to be 155 mm of Hg and mean diastolic blood pressure was found to be 91 mm of Hg and the history of hypertension was found in 47.3% of ischemic and 51.5% of haemorrhagic patients. In our study we found smoking as the second common modifiable risk factor 34 % ischemic stroke patients and 33.3% of haemorrhagic patients was smoker.

CONCLUSION
Undiagnosed and untreated hypertension and lack of awareness of the risks factors are some of the areas of concern. Health system needs to be reoriented to encourage health education regarding NCD and, to promote identification and management of modifiable risk factors and life style modification among general public and health functionaries.

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DISCUSSION:-
Our study has shown the ischemic to haemorrhagic ratio of 2.75: