ORIGINAL ARTICLE

Prevalence of Hypertension in Hemorrhagic Stroke at NGMCTH, Kohalpur

Shrestha A[1] , Shrestha R[2]

ABSTRACT

Aim : To study the prevalence of hypertension in hemorrhagic stroke in patients admitted in medical units of Nepalgunj Medical College Teaching Hospital (NGMCTH), Kohalpur.

Background : Hemorrhagic stroke has remained a serious disease despite recent advances in medical treatment. It is one of the most common emergencies encountered in clinical practice and predominantly effects elderly population leading to chronic disability and dependency. This study was designed to identify hypertension as a major cause of Intracerbral hemorrhage (ICH).

Material and methods : This is a cross sectional descriptive study conducted in the department of medicine of NGMCTH, Kohalpur between June 2017 and November 2017. A total of 51 patients were included in the study. History and clinical examinations were recorded. Plain CT scan head, ECG and chest x-ray PA view were done and the data were recorded and analysed.

Result : The age of patients ranged from 48 to 89 years with the mean age of 66.72 years. Among 51 patients, high BP at presentation along with ECG showing LVH was seen in 38 patients (74.5%) and chest x-ray PA view showing cardiomegaly was seen in 31 patients (60.8%). Most commonly involved ethinic group was Tharu (45.1%).

Conclusion : Hypertension is a major cause of ICH. So, early detection and regular treatment of hypertension with appropriate antihypertensive drugs and life style modification would prevent ICH.

Key words: *Hemorrhagic stroke, hypertension, stroke*

INTRODUCTION

Intracerebral hemorrhage accounts for 10% of all strokes and is associated with 50% fatality rate. Incidence rates are high in Asians and blacks. Hypertension, trauma, cerebral amyloid angiopathy cause the majority of these hemorrhages. Hypertensive intraparenchymal hemorrhage results from spontaneous rupture of small penetrating artery deep in brain. The most common sites are basal ganglia (especially putamen), thalamus, cerebellum and pons. Blood may dissect into the ventricular space, which increases morbidity and may cause hydrocephalus. Most develop over 30 – 90 minutes. After 1- 6 months it is resolved to slit-like orange cavity lined with glial scar and hemosiderin-laden macrophages.[1]

Hemorrhagic stroke is one of the most important causes of severe disability. In NGMCTH, Kohalpur, Nepal, it comes among the most common disease admitted in medical wards and also one of the commonest cause of hospital death.

Hypertension is a known cause for hemorrhagic stroke and by modifying this factor clinicians have been trying to decrease morbidity & mortality. The mortality rate has declined in many developed countries due to effective control of hypertension.[2] Studies about prevalence of hypertension in hemorrhagic stroke in Nepal are very few and it is not known whether hypertension is major cause or not. Hence this study has been taken up.

MATERIAL AND METHODS

This is a hospital based cross sectional study conducted in 51 patients who were admitted as hemorrhagic stroke in medical unit of NGMCTH, Kohalpur between June 2017 to November 2017. A detailed history, general examination and complete nervous system examination was done and hemorrhagic stroke was confirmed by plain Computerihzed Tomography (CT) scan of head. Hyperdense area within the cerebral substance was taken as CT criteria for the diagnosis of intracranial hemorrhage. Informed consent of the patient and permission from Institutional review Committee (IRC) of the hospital was also obtained. All the cases of Extradural, subdural, subarachnoid hemorrhage and traumatic intracranial hemorrhage were criteria for non-inclusion to the study.

1. Dr. Anil Shrestha
2. Dr. Richa Shrestha

Address for correspondence:
Dr. Anil Shrestha
Department of Medicine
Nepalgunj medical College Teaching Hospital
Kohalpur, Banke, Nepal
Email: shtanil4@gmail.com

Blood pressure (BP) was measured by standard mercury sphygmomanometer; patients were labeled hypertensive if they fulfilled one of the following criteria:

I. Past history of hypertension with or without regular treatment.

ii. Systolic BP ≥ 140 mmHg or diastolic BP ≥ 90 mm Hg,[3] along with Left Ventricular Hypertrophy (LVH) by Electrocardiography (ECG) or cardiomegaly by chest X-ray Posterioanterior (PA) view.

iii. Hypertensive changes in fundoscopy.
- Grade I – Arteriolar thickening, tortuosity and increased reflectiveness (silver wiring)
- Grade II – Grade I plus constriction of veins at arterial crossings (arteriovenous nipping)
- Grade III- Grade II plus evidence of retinal ischemia (flame shaped or blot haemorrhage and cotton wool exudates)
- Grade IV – Grade III plus papilloedema.[4]

High BP at presentation most likely reflects altered hemodynamics due to intracerebral mass effect or acute changes in catecholamines. So considering them as hypertensive would give false positive result.
Thus for more accurate results ECG and chest x-ray PA findings were taken into account.

Sokolow-Lyon criteria were used to diagnose LVH in ECG.[5] Cardiothoracic ratio ≥ 1:2 were considered cardiomegaly on chest X-ray PA view.[6]

Data were analysed using standard statistical method including SPSS 17.0.

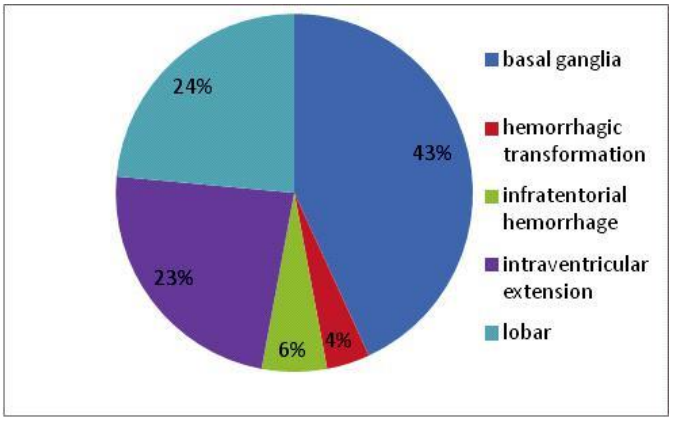
RESULT

A total of 51 patients with the diagnosis of hemorrhagic stroke were included in the study. Age ranged from 48 to 89 years and mean age was 66.70 years. Among 51 patients, 26 (51%) were male, 25 (49%) were female and M:F ratio was 1.04:1. Seven major ethnic groups were detected and majority of patients were Tharu (45.1%) followed by Brahmins (11.8%) as shown in table 1.

		N	%
Age (Year)	< 50	3	5.9%
	50 - 60	10	19.6%
	60 - 70	19	37.3%
	>=70	19	37.3%
	Mean	66.7±10.2	
	Minimum	48	
	Maximum	89	
Gender	Male	26	51.0%
	Female	25	49.0%
Ethnicity	Brahmin	6	11.8%
	Chhetri	5	9.8%
	Magar	4	7.8%
	Muslim	3	5.9%
	Newar	5	9.8%
	Others	5	9.8%
	Tharu	23	45.1%

Table 1: Demographic characteristics of study population (n=51)

Majority of the patients (43.1%) had basal ganglia hemorrhage followed by lobar hemorrhage (24%) as shown in figure 1.



Figue:1 Anatomical distribution of hemorrhagic Stroke patients (n=51)

Out of 51 patients, 17 (33.3%) had past history of hypertension, 7 patients (13.7%) had no history of hypertension and 27 patients (52.9%) did not know whether they had hypertension or not in the past. Among this 17 patients, only 4 (23.5%) were on regular medication as well as periodic assessment of hypertension and 13 (76.5%) were taking medicine irregularly. Out of total 51 patients, hypertension at presentation was present in 42 (82.4%) patients, among them, 38 (74.5%) patients had LVH in ECG and 31 (60.8%) had cardiomegaly in chest X-ray PA view, 35 (68.6%) had hypertensive changes in fundoscopy, which suggest that 38 (74.5%) had chronic hypertension by ECG correlation and 31 (60.8%) had chronic hypertension by chest x-ray PA correlation and 35 had chronic hypertension by fundoscopy correlation, as shown in table 2. Out of 35 patients who had hypertensive changes on fundoscopy, 22 (62.86%) had grade I, 9 (25.7%) had grade II and 4 (11.43%) had grade III hypertensive retinopathy.

		N	%
History of hypertension	Yes	17	33.3%
	No	7	13.7%
	Don't Know	27	52.9%
Treatment of hypertension (n=17)	Regular	4	23.5%
	Irregular	13	76.5%
Blood pressure at presentation	Normal	9	17.6%
	HTN	42	82.4%
ECG	Normal	13	25.5%
	LVH	38	74.5%
Chest X-Ray (PA view)	Normal	20	39.2%
	Cardiomegaly	31	60.8%
Hypertensive changes in fundoscopy	Yes	35	68.62%
Grade – I (n=35)		22	62.86 %
Grade – II (n=35)		9	25.71%
Grade – III (n=35)		4	11.43%

Table 2 : Clinical profile of hemorrhagic stroke patients (n=51)

Maximum systolic blood pressure (SBP) at presentation was 220 mmHg, minimum was 120 mmHg and mean SBP was 174 mmHg. Likewise, maximum diastolic blood pressure (DBP) at presentation was 140 mmHg, minimum was 80 mmHg and mean DBP was 103 mmHg, as shown in table 3.

Blood Pressure		Male (n=26)	Female (n=25)	Total (n=51)
Systolic BP	Mean±SD	173.8 ±24.1	174.2 ±27.8	174.01±25.7
	Minimum - Maximum	120 - 220	120 - 200	120 - 220
Diastolic BP	Mean±SD	104.61±15.2	101.8±16.1	103.2±15.6
	Minimum - Maximum	80 -140	80 -140	80 -140

Table 3: Blood pressure at presentation

DISCUSSION

Cerebrovascular disease is the third most common cause of death after coronary artery disease and cancer in western countries.[7] The overall incidence of stroke increases with age in both sexes.[1]

Present study included 51 patients. Incidence of hemorrhagic stroke was more in age group above 60years and mean age was 66.70 years. Similar report was shown by Nechikkat S. et al[8] in which most common age group was in 61-70 years and mean age was 67 years. Arrissen MJ. et al[9] and Broderich J. et al[10] in their study also found increasing age as a risk factor for ICH.

In this study, 51% were male and 49% were female showing slight male predominance. In the study done by Arrissen MJ et al,[9] also concluded that ICH was most common in male then female.

Regarding ethinicity, majority of patients were Tharu (45.2%) followed by Brahmins (11.8%). Such large dominance of Tharu population could be due to lack of hypertension awareness, high salt taking habits and demography of this area. Lee KR et al[11] in 1997 found hypertensive intracerebral hemorrhage more common among Blacks and Asians than Whites. The present data suggest that racial and ethinic factor might play some role in ICH occurrence since Tharus are definitely not of white race.

In this study, hypertension at presentation along with LVH in ECG was found in 74.5% , cardiomegaly in chest X-ray PA view in 60.8% and hypertensive changes in fundoscopy in 68.62 %. This is comparable to the study done by Herekar A et al[12] which also showed hypertension in 71.4% of ICH. Similarly Brott T et al[13] in 1986 found hypertension with LVH by ECG or cardiomegaly by chest x-ray in 56% of ICH patients.

Kumar S in recent study investigated possible etiology in 439 patients and found hypertension in about 80% of the patients.[14] Similarly, Arissen MT et al,[9] An SJ et al[15] in 2017, R Muller et al[16] in 1981 and Juvela S in [17] 1995 found hypertension as a leading cause of ICH.

Past history of hypertension was present in 17 patients (33.3%), out of them 13 (76.5%) were on irregular treatment and developed ICH. So early detection and regular treatment of hypertension is mandatory to reduce the incidence of ICH.

CONCLUSION

The present study comprised of 51 patents out of which 51% were male and 49% were female, showing slight male predominance. Maximum incidence of ICH was seen in subjects above 60 years. Hypertension was present in 74.5% after correlating BP at presentation with LVH shown by ECG. This concludes that hypertension is the major cause of ICH. Therefore, early detection and regular treatment is warranted for the prevention of ICH. On the other hand, majority of patients developing ICH were Tharu (45.1%). The reason behind might be lack of awareness to hypertension, high salt taking habit in these community and demography of this area where 18% of population is of Tharu. In addition to this, racial and ethinic factor may play some role in ICH occurrence.

REFERENCE

1. Smith WS, English JD, Johnson SC. Cerebrovascular disease. In Longo DL, Fausci AS, Kasper DL,Hauser SL, Jameson JL, Loscalzo J, editors. Harrison's principles of

internal medicine. 18 th edition. New York: McGraw Hill; 2012, Vol. 2, p 3270-99.

2. Abbott RD, Yin Y, Reid DM, Yano K. Risk of stroke in male cigarette smokers. N Engl J Med. 1986;315:717-23.
3. Kotchen TA. Hypertensive vascular disease. In: Fauci AS, Braunwal E, Kasper DL, Hauser SL,Longo DL, Jamenson Jl, editors. Harrison's principles of internal medicine. 17 th edition. New York:McGraw Hill; 2008, p 1553.
4. Newby DE, Grubb NR, Bradbury A. Cardiovascular disease. In: Colledge NR, Walker BR, Ralston SH, editors. Davidson's Principles and practice of medicine. 21 st edition. China: Elsevier; 2010, p607.
5. Wagner GS. Marriot's practical Electrocardiography. 11 th edition. India: Lippincott Williams &Wilkins; 2008, p 93.
6. Glynn M, Drake WM. Hutchison's clinical methods. 23 rd edition. China: Elsevier; 2012, p 196.
7. Bronner LL, Kanter DS, Manson JE. Primary prevention of stroke: a review. N Engl J Med 1995;23: 1392-1400.
8. Nechikkat S, Chandni R, Sasidharan PK. Hypertension as a risk factor for haemorrhagic stroke in females. JAPI 2014; vol. 62, Nov, 24–8.
9. Ariesen Mj, Claus SP, Rinkel GJE, and Algra A. Risk factors for intracerebral hemorrhage in the general population: a systematic review. Stroke 2003; 34 (8), 2060–66.
10. Broderick J, Brott T, Tomsick T, Miller R, Huster G. Intracerebral hemorrhage more than twice as common as subarachnoid hemorrhage. J Neurosurg 1993; 78: 188-91.
11. Lee KR, Kawai N, Kim S, Sager O, Hoff JT. Mechanism of edema formation after intracerebral hemorrhage: effects of thrombin on cerebral blood flow, blood brain barrier permeability and cell survival in rat mode. J Neurosurg 1997; 86: 272.
12. Herekar A, Hilal S. Multicentrer based study on stratification of modifiable risk factors in stroke. Pak J Med Sci 2008; 24 (6): 853-6.
13. Brott T, Thalinger K, Hertzberg V. Hypertension as a risk factor for spontaneous intracerebral hemorrhage. Stroke 1986; 17 (6): 1078-83.
14. Kumar S. Hypertension and hemorrhagic stroke. Hypertense J 2017; 3(2): 89-93.
15. An SJ, Kim TJ, Yoon Bw. Epidemiology, risk factors and clinical features of intracerebral hemorrhage: an update. J stroke 2017; 19(1): 3-10.
16. Muller R, Radu EW. Intracerebral hematoma. Neurology 1981; 13: 320-51.
17. Juvela S. Risk factors for impaired outcome in spontaneous ICH. Arch Neurol 1995; 52: 1193-1200.