ISSN 2515-8260 Volume 09, Issue 02, 2022

A study of clinical profile of hemorrhagic stroke from government hospital, Gandhinagar, Gujarat

[1]Dr. Chirayu Vijaykumar Vaidya, [2]Dinker N Goswami, [3]Dr. Drusty K Majmudar

[1]Assistant Professor, Department of Medicine, GMERS Medical College and Hospital, Gandhinagar, Gujarat, India
[2]Professor, Department of Medicine, GMERS Medical College and Hospital, Gandhinagar, Gujarat, India
[3]Associate Professor, Department of Radiology, Shrdaben Hospital, NHL Municipal Medical College, Ahmedabad, Gujarat, India

Corresponding Author:
Dr. Chirayu Vijaykumar Vaidya (drchirayuvaidya@gmail.com)

Abstract

Background: Cerebrovascular diseases rank first in frequency and importance among all neurologic diseases. Of all the cerebrovascular diseases, intracerebral hemorrhage is the most dramatic and catastrophic. Various clinical and radiological parameters have been proved useful as predictors of prognosis in spontaneous intracerebral hemorrhage. This study is to identify the risk factors, assess various clinical and radiological features with patients attending GMERS medical college and general hospital in city Gandhinagar in Gujarat state.
Methods: This is a retrospective study of all new patients managed for hemorrhagic stroke of GMERS Medical College and Hospital, Gandhinagar, Gujarat from January1 2012 to December 31, 2013.
Results: The mean age of patient was 61.77 yrs with highest number(30.5%) of total pts in the age group of 61-70 yrs. Young hemorrhagic stroke (age ≤45 yrs) was in(13.4%). The male to female ratio was 1.05:1 with (51.2%) males & (48.8%) females. Equal percentage (35.1%) patients presented with right and left hemiplegia respectively followed by (29.9%) patients with global stroke. Most common clinical presentation was hemiplegia which was (44.6%) followed by altered sensorium (21.5%) and speech involvement (13.2%). Most common risk factor was Hypertension with (49.3%) incidence. It followed by previous H/o Cerebrovascular accident (13.7%), Smoking (11%). Most common site of hemorrhage was thalamus and basal ganglia (78%), lobar (28%) followed by ventricular (13.2%).
Conclusion: Incidence of hemorrhagic stroke was more in the age group of 61-70 yrs with male predominance with hypertension as the most common risk factor and most common area of hematoma was in thalamoganglionic region.

Keyword: Hemorrhagic stroke, thalamoganglionic, hypertension, smoking

Introduction

Stroke is the second leading cause of death worldwide, and one of the leading causes of disability. With increasing life expectancy the burden of stroke is likely to increase

ISSN 2515-8260 Volume 09, Issue 02, 2022

worldwide with middle and low income countries particularly affected. Acute Hemorrhagic stroke is defined as a non-traumatic abrupt onset of altered level of consciousness or focal neurological deficit that is associated with focal collection of blood within the brain parenchyma as observed on CT scan and is not caused by hemorrhagic transformation of cerebral infarction [1]. Intracerebral hemorrhage is the second most Common subtype of stroke after ischemic stroke and accounts for approximately 10% to 20% of all strokes. Hypertension has been identified as the single most important risk factor causing intracerebral hemorrhage. Other risk factors include alcohol, smoking, diabetes, anticoagulant use [2] and other genetic risk factors. The incidence of intracerebral hemorrhage increases with age and it is more among men and in Asians [1]. Stroke is the 3rd leading cause of death behind heart disease and cancer. Hemorrhagic stroke accounts for 10 to 15% of stroke in United States and Europe and 20 to 30% in Asia. It has a high mortality of 40 to 50% and leaves survivors with a greater disability compared to ischemic stroke [3].

Patients with large hemorrhage exhibit a sudden onset of focal neurologic

Deficit [4]. Headache [5], vomiting [6] and depressed conscious state [5, 6] are common with focal signs dependent on the site of haemorrhage [7]. The most common site of bleeding is in the deep region of the brain involving putamen, thalamus and caudate nucleus, where it results from rupture of the vessels

Near the base of the brain [8].

Hospital admissions for ICH have increased by 18% in the past 10 years. ICH is a medical emergency. Rapid diagnosis and attentive management of patients with ICH is crucial because hematoma expansion and early deterioration is common in the first few hours after ICH onset. It is very difficult to determine whether the presenting neurological symptoms are due to cerebral ischemia or ICH based on the clinical characteristics alone. Vomiting, elevated systolic blood pressure (SBP) (>220 mmHg), severe headache, coma or decreased level of consciousness and progression of neurological deficit over minutes or hours are suggestive of ICH, although none of these features are specific and, therefore, neuroimaging examination is mandatory. Neuroimaging data, particularly computed tomography (CT) is needed to rule out stroke mimics, to confirm the clinical diagnosis and to distinguish ischemia from ICH [9, 10].

Methods

This is a retrospective study of 82 cases managed for hemorrhagic stroke in the medical ward of GMERS Medical College and Government Hospital Gandhinagar, Gujarat from January 1, 2012 to December 31, 2013.The case notes of the pts were retrieved from the medical record department of the hospital and relevant data extracted and analyzed. We have only CT scan machine in house, for MRI we have to send pts to higher centers.

Inclusion criteria: All pts above age 18 yrs & having clinical & CT confirmed diagnosis of hemorrhagic stroke.

Exclusion criteria

1. Pts below 18.
2. Traumatic intracerebral hemorrhage.
3. Hemorrhagic infarction.
4. Primary subarachnoid hemorrhage.
5. Pts' medical records which were not showing CT confirmed diagnosis.
6. Medical records in which pt sent for MRI brain with inconclusive CT scan findings.

ISSN 2515-8260 Volume 09, Issue 02, 2022

The data obtained were analyzed using SPSS version 21.0 software. Results were expressed in frequencies and percentages.

Results

82 cases of hemorrhagic stroke case records managed in medical ward of GMERS Medical College and Government Hospital, Gandhinagar during a period of 1st January 2012 to 31st December 2013 were studied & evaluated for clinical profile & frequency of risk factors.

Incidence of age

The age range was from 35 yrs to 100 yrs with mean age of 61.77 yrs. In this study youngest pt was 35 yrs & oldest was 100 yrs old. The incidence of hemorrhagic stroke is maximum in the age group of 61-70 yrs which comprises of 30.5% of total pts, as shown in (Table -1). Young hemorrhagic stroke (age ≤45 yrs) comprised of 13.4% of all pts.

Table 1: Frequency & percentage of cases according to age groups

Age groups	30-40	41-50	51-60	61-70	71-80	81-90	91-100	Total
Frequency	7	15	19	25	9	5	2	82
Percent	8.5	18.3	23.2	30.5	11	6.1	2.4	100

Sex distribution of stoke pts

Out of 82 pts, 42(51.2%) were males & 40(48.8%) were females as shown in (Table-2). The male to female ratio was 1.05:1.
From above observation it can be concluded that incidence of hemorrhagic stroke is more common in male sex.
As shown in (Table-3) majority of females (14) and majority males (11) were in 61 to 70 years age group.

Table 2: Sex wise distribution of hemorrhagic stroke cases

Sex	Frequency	Percent
Female	40	48.8
Male	42	51.2
Total	82	100.0

Table 3: Age group & gender distribution

Sex	Age groups							
	30-40	41-50	51-60	61-70	71-80	81-90	91-100	
F	3	4	10	14	7	2	0	40
M	4	11	9	11	2	3	2	42
Total	7	15	19	25	9	5	2	82

Neurological presentation of hemorrhagic stroke pts

In our study (as shown in Table-4) equal percentage (35.1%) patients presented with right and left hemiplegia respectively and (29.9%) patients were having global stroke.

ISSN 2515-8260 Volume 09, Issue 02, 2022

Table 4: Frequency & percentage of neurological presentation of stroke

Neurological presentation	Rt stroke + Lt hemiplegia	Lt stroke + Rt hemiplegia	Global
Frequency	27	27	23
Percent	35.1%	35.1%	29.9%

Clinical presentation of hemorrhagic stroke pts

In my study as shown in (table 5) most common clinical presentation was hemiplegia which was (44.6%) followed by altered sensorium (21.5%), speech involvement (13.2%), convulsions (8.3%), vomiting (7.4%), headache (3.3%). instability of gait (1.7%).

Table 5: Frequency & percentage of clinical features of stroke pts

Clinical features	Altered sensorium	Instability of gait	Convulsions	Speech involvement	Headache	Vomiting	Hemiplegia
Frequency	26	2	10	16	4	9	54
percent	21.5%	1.7%	8.3%	13.2%	3.3%	7.4%	44.6%

Prevalence of risk factors in hemorrhagic stroke pts

In our study most common risk factor was Hypertension with (49.3%) incidence. It followed by previous H/o Cerebrovascular accident (13.7%), Smoking (11%), Dyslipidemia (8.2%), equal percentage (6.8%) of Diabetes Mellitus and Alcohol and H/o previous coronary artery disease with (4.1%), as shown in (Table-6).

Table 6: Frequency & percentage of hemorrhagic stroke risk factors

Risk factors	HT	DM	Past h/o CAD	Dyslipidemia	Alcohol	Smoking	Past h/o CVD
Frequency	36	5	3	6	5	8	10
Percent	49.3%	6.8%	4.1%	8.2%	6.8%	11%	13.7%

Topographic distribution of hemorrhage

In our study most common site of hemorrhage was thalamus (27.9%) followed by basal ganglia (18.6%) ventricular (13.2%), Parietal (9.3%), Centrum semiovale (7%) and frontal (6.2%), other areas of brain are shown in (Table-7).

Table 7: Topographic distribution of cerebral hemorrhage

Affected areas of brain on CT scan brain	Cerebral hemorrhage	
	Frequency	Percent
Pons	3	2.3%
Midbrain	4	3.1%
Thalamus	36	27.9%
Basal ganglia	24	18.6%
Centrum semiovale	9	7%
Paraventricular	3	2.3%
Ventricular	17	13.2%
External capsule	2	1.6%
Internal capsule	5	3.9%
Lentiform nucleus	1	0.8%
Cerebellar	2	1.6%
Frontal	8	6.2%
Parietal	12	9.3%
Temporal	3	2.3%

ISSN 2515-8260 Volume 09, Issue 02, 2022

Discussion

In our study mean age of presentation with hemorrhagic stroke was 61.77 yrs. In study done by S F Sia *et al*. [11], mean age was 61.6±16.7 years, which was consistent with our study. The incidence of hemorrhagic stroke in our study was maximum in the age group of 61-70 yrs which comprises of 30.5% of total pts. This observation was correlating with study done by Gauri *et al*, [12] in which majority (33%) patients were from sixth decade. It was also observed in study by Nileshkumar *et al.*, [13] in which majority (30%) patients were in age group 55 to 64 years. Young hemorrhagic stroke (age ≤45 yrs) comprised of 13.4% of all pts. It correlates with other studies [14, 15], in which the frequency of ICH among a series of stroke in young adults varies from 0.7% to 40%.

Out of 82 pts, 42(51.2%) were males & 40(48.8%) were females. From above observation it can be concluded that incidence of hemorrhagic stroke is more common in male sex. This correlates with study done by Nileshkumar *et al.*, [13] in which 80% were males, in study by Gauri *et al.*, [12] 67% were males and 33% females. In study done by Azra *et al.*, [16] 62% males and 38% were females. The male to female ratio was 1.05:1. This was seen in in study done by SF Sia *et al.*, [11] male to female ratio was 1:1.

In our study equal percentage (35.1%) patients presented with right and left hemiplegia respectively and (29.9%) patients were having global stroke. It differed from study done by Abu Naser *et al.*, [17] in which majority patients were having right sided hemiplegia.

In our study most common clinical presentation was hemiplegia which was (44.6%) followed by altered sensorium (21.5%) and speech involvement (13.2%), which correlates with study done by Azra *et al.*, [16] in which most common was hemiplegia (78%), speech involvement (60%) followed by altered sensorium (35%). In study done by Abu Naser *et al*. [17], most common clinical feature was hemiplegia (85%) and impaired consciousness (80%). In study by Parvaiz A Shah *et al.*, [18] Hemiplegia and altered sensorium were the most common symptoms/signs, seen in 70.4% and 45.5% of patients respectively. In study by Naik M *et al.*, [19] most common clinical feature was hemiplegia (49.3%) and loss of consciousness (37.3%).

In our study most common risk factor was Hypertension with (49.3%) incidence. It followed by previous H/o Cerebrovascular accident (13.7%) and Smoking (11%). In study by SF Sia *et al.*, [11] Hypertension was the most common cause of ICH which accounts for 84.8% of the patients. In study done by Gauri *et al*., [12] in which Hypertension was most common, found in 51%, smoking in 23%, past history of TIA/stroke in 11% of cases. In study done by Abu Naser *et al*. [17] also Hypertension was the most common in (80%) of cases. In study by Parvaiz A Shah *et al.*, [18] hypertension was most common (92.3%) risk factor. In study by R P Eapen *et al.*, [20] in hemorrhagic stroke most common risk factor was hypertension in this series.

In our study most common site of hemorrhage was thalamus and basal ganglia (78%), lobar (28%) followed by ventricular (13.2%). This was seen in study by SF Sia *et al*, [11] in which also most common was thalamus and basal ganglia (45.1%) followed by lobar (32.9%). In study by Adria Arborix *et al.*, [21] lobar ICH was the most frequent (33.2%) followed by hemorrhages in the thalamus (13.5%), basal ganglia (10.5%). In study done by Spyridon Roditis *et al.*, [22] the most common locations of hemorrhagic stroke were basal ganglia/internal capsule in 4 patients and lobar in 4 patients. This findings correlates with study done by Eapen *et al*. [20] and Aiyer *et al*. [23] where it has been concluded that in multiple hematoma sites most common was thalamic ganglionic region. In the study by Pipat Chiewvit *et al.*, [24] the authors.

Found that fifty-three cases (53/131 cases, 40.5%) with thalamic-ganglionic hemorrhage, nineteen cases (19/131 cases, 14.5%) in lobar hemorrhage. In study done by Abu Naser *et al.*, [17] cortical area of cerebrum was the most affected area in hemorrhagic (65%) stroke. In

study done by Azra *et al*., [16] Basal ganglia (55%) was the commonest site of bleed followed by thalamus (26%), cerebral hemispheres (11%). In study by Nileshkumar *et al.*, [13] most common sites of hematoma were Ganglio-thalami (46%), Lobar (28%) and Ganglio-capsula (20%). In study done by Gauri *et al.*, [12] Common sites of haemorrhage were lobar 32%, ganglionic 29%, thalamic 14%. All these studies were showing most common areas of hematoma in thalamoganglionic and lobar region.

Conclusion

To conclude mean age of presentation with hemorrhagic stroke was 61.77 yrs. The incidence of hemorrhagic stroke was maximum in the age group of 61-70 yrs with male predominance. Young hemorrhagic stroke (age ≤ 45 yrs) comprised of 13.4% of all pts. The male to female ratio was 1.05:1. Equal percentage of patients presented with right and left hemiplegia. Most common clinical presentation was hemiplegia which was followed by altered sensorium and speech involvement. Most common risk factor was Hypertension followed by previous H/o Cerebrovascular accident and Smoking. Most common site of hemorrhage was thalamus and basal ganglia, lobar followed by ventricular.

Acknowledgements

Sincerely thankful to Mr. Sanjay Makwana, data entry operator for helping in data analysis & medical record department in charge for helping in medical record retrieval.

Declarations

Funding: None.

Conflict of interest: None declared.

References

1. Dennis MS, Burn JP, Sandercock PA, Bamford JM, Wade DT, Warlow CP. Long term survival after first-ever stroke: the Oxfordshire Community Stroke Project. Stroke. 2006;24:796-800.
2. Marfan Ikram, Renske G Wieberdink, Peter J Koudstaal. International epidemiology of Intracerebral hemorrhage. Current Atherosclerosis reports. 2012;14(4):300-306.
3. Hatano S. Experience from a multicenter stroke registers. A preliminary report. WHO. 2004;54:541-53.
4. Dollberg S, Rosin AJ, Fisher D. A new look at the natural history and clinical features of intracerebral hemorrhage: a clinical CT scan correlation. Gerontology. 1986;32:211-6.
5. Feldmann E. Intracerebral hemorrhage. Stroke. 1991;22:684-91.
6. Aring CD, Merritt HH. Differential diagnosis between cerebral hemorrhage and cerebral thrombosis: a clinical and pathologic study of 245 cases. Arch Intern Med. 1935;54:435-56.
7. Kase CS. Diagnosis and management of intracerebral hemorrhage in elderly patients. Clin Geriatr Med. 1991;7:549-67.
8. Ojemann RG, Mohr JP. Hypertensive brain hemorrhage. Clin Neurosurg. 1976;23:220-44.
9. Kase CS, Mohr JP, Caplan LR. Intracerebral hemorrhage. In: Mohr JP, Choi DW, Grotta JC, Weir B, Wolf PhA, eds. Stroke. Pathophysiology, diagnosis, and management. Churchill Livingstone, Philadelphia, 2004, 327-376.

10. Arboix A, Comes E, García-Eroles L, Massons J, Oliveres M, Balcells M, *et al*. Site of bleeding and early outcome in primary intracerebral hemorrhage. Acta Neurol Scand. 2002;105:282-288.
11. Sia SF, Tan KS, Waran FV. Primary Intracerebral Haemorrhage in Malaysia: In-hospital Mortality and Outcome in Patients from a Hospital Based Registry. Med J Malaysia. October. 2007;62(4):308-312.
12. Gauri*et al*. A Prospective Study of Haemorrhagic Stroke in Bikaner. Journal of API, 2000 Jan, 48(1).
13. Nileshkumar M, Rajiv Pandya, Chetan Vaghani. A study on clinical profile, risk factors and mortality in hypertensive intracerebral hemorrhage in a tertiary care hospital in Surat city. National journal of medical research. 2013 Oct-Dec;3(4):381-384.
14. Nencini P, Inzitari D, Baruffi MC, Fratiglioni L, Gagliardi R, Benvenuti L, *et al*. Incidence of stroke in young adults in Florence, Italy. Stroke. 1988;19:977-981.
15. Bevan H, Sharma K, Bradley W. Stroke in young adults. Stroke. 1990;21:382-386.
16. Azra Zafar, Farrukh Shohab Khan. Clinical and radiological features of intracerebral haemorrhage in hypertensive patients. J Pak Med Assoc. 2008 Jul;58(7):356-358.
17. Abu Naser Siddique, Zannatun Nur, Shahriar Mahbub, Billal Alam, Titu Miah. Clinical presentation and epidemiology of stroke-a study of 100 cases. J Medicine. 2009;10(2):86-89.
18. Parvaiz A Shah, Hussain G Bardi, Bashir A Naiku, Khaliq A, Rakesh K Kaul. Clinico-radiological profile of strokes in Kashmir Valley, North-West India: A study from a university Hospital. Neurology Asia. 2012;17(1):5-11.
19. Naik M, Rauniyar RK, Sharma UK, Dwivedi S, Karki DB, Samuel JR. Clinico-radiological profile of stroke in eastern Nepal: A computed tomographic study. Kathmandu University Medical Journal. 2006;4(2):161-166.
20. Eapen RP, Parikh JH, Patel NT. A Study of Clinical Profile and Risk Factors of Cerebrovascular Stroke. Gujarat medical journal. 2009;64(2):48-54.
21. Adrià Arboix, Elisenda Grivé. Intracerebral Hemorrhage: Influence of Topography of Bleeding on Clinical Spectrum and Early Outcome. Neuroimaging. Methods Published online Edited by Prof. Peter Bright, 2012 Feb, 278-292.
22. Spyridon Roditis, Nicolai Ianovici. Hemorrhagic stroke in young people. Romanian Neurosurgery. 2011;18(3):294-299.
23. Aiyar, *et al*. A study of clinic radiological correlation in cerebrovascular stroke. Gujarat Medical Journal, 1999 Mar, 52.
24. Pipat Chiewvit, Nasuda Danchaivijitr MD. Computed Tomographic Findings in Non-traumatic Hemorrhagic Stroke. J Med Assoc Thai. 2009;92(1):73-86.