

## RESEARCH ARTICLE

# Clinical profile of patients with stroke in a tertiary hospital setting in rural Telangana

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Received: March 04, 2020; Accepted: March 28, 2020

### ABSTRACT

**Background:** Stroke is the second leading cause of death and the third leading cause of disability across the world. The understanding of stroke in a clinical setting is what we wanted to achieve as there is a very scarce amount of data present in India when it comes to vascular diseases, especially the rural part of India. **Aims and Objectives:** The aims of the study were (1) to study the clinical profile of stroke and (2) to study the prescribing pattern of drugs in stroke patients attending a tertiary care hospital in rural Telangana. **Materials and Methods:** A retrospective case sheet-based study was conducted in a tertiary care institute from January 01, 2015, to July 31, 2016. The approval for the study was obtained from the Institutional Ethics Committee. **Results:** Of the total 155 stroke case sheets analyzed, the majority had an ischemic stroke (91.61%). The incidence of stroke was more in the 50–70 years age group with male preponderance. The most commonly involved area and presentation were capsuloganglionic region and hemiparesis (75.48%), respectively. About 97.89% of ischemic stroke patients were treated by antiplatelet agents (aspirin – 66.2% and clopidogrel – 31.69%). All the hemorrhagic stroke patients were managed by mannitol. The most commonly prescribed antihypertensives medications were calcium channel blockers (55.45%). **Conclusion:** Ischemic stroke is the most common type of stroke with increased occurrence in the age group of the 5<sup>th</sup>–7<sup>th</sup> decade and male preponderance. Capsuloganglionic infarction or hemorrhage was the most common radiological finding with hemiparesis being the most common presentation. Antiplatelet agents (aspirin and clopidogrel) and mannitol were prescribed in ischemic and hemorrhagic stroke, respectively.

**KEY WORDS:** Ischemic Stroke; Hemorrhagic Stroke; Hypertension; Aspirin, Mannitol

### INTRODUCTION


Stroke is the second leading cause of death and the third leading cause of disability across the world.<sup>[1,2]</sup> The incidence and prevalence of stroke vary depending on the demographics and habits and the outcome is dependent on the treatment at

their disposal. Affecting a large group of population among the adults, stroke contributes to the major disabilities affecting the rehabilitative costs posing difficulties in health planning and management.<sup>[3]</sup> The understanding of stroke in a clinical setting is what we wanted to achieve as there is a very scarce amount of data present in India when it comes to vascular diseases, especially the rural part of India.

### Objectives

The objectives of the study were as follows:

1. To study the clinical profile of stroke
2. To study the prescribing pattern of drugs in stroke patients attending a tertiary care hospital.

Access this article online	
Website: <a href="http://www.njppp.com">www.njppp.com</a>	Quick Response code 
DOI: 10.5455/njppp.2020.10.03078202028032020	

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## MATERIALS AND METHODS

This was a retrospective observational case sheet based study conducted on the stroke cases those who presented to the Department of General Medicine, Mediciti Institute of Medical Sciences, Telangana, from January 01, 2015, to July 30, 2016. The approval for the study was obtained from the Institutional Ethics Committee. The detailed inclusion and exclusion criteria were as follows:

### Inclusion Criteria

Case sheets of patients were included in the study.

1. Aged  $\geq 18$  years
2. Having clinical and/or radiological confirmed diagnosis of stroke.

### Exclusion Criteria

Case sheets of patients were excluded from the study.

1. With incomplete data
2. Who left against medical advice (LAMA)
3. Which did not meet inclusion criteria.

The data were extracted in an elaborate pre-structured pro forma that included the clinical presentations, radiological findings, and medications prescribed.

### Statistical Analysis

The data were entered into excel spreadsheet and statistical analysis was done by applying descriptive statistics to generate frequencies, proportions, and percentages. Continuous data were summarized as mean (SD). Z test of significance was used where appropriate. All the statistical analyses were done using Microsoft Excel and Social Science Statistics Calculators ([www.socialsciencestatistics.com](http://www.socialsciencestatistics.com)).<sup>[4]</sup>

## RESULTS

A total of 155 stroke case sheets were analyzed. Of them, the majority of the patients had an ischemic stroke (91.61%) and the rest had a hemorrhagic stroke (8.39%).

### Age at Presentation

The age range of stroke patients in this study was from 24 to 90 years. The incidence of stroke was more in the age groups of 50–70 years which accounted to 63.23% of the cases. The occurrence of stroke in younger age (age  $\leq 45$  years) comprised 13.55% of patients. The mean (SD) age of the patients was 60.22 (11.83) years. The mean (SD) age of patients with ischemic and hemorrhagic stroke was 60.5 (12.09) years and 56.15 (7.69) years, respectively. Details of age distribution are shown in Tables 1 and 2.

### Sex Distribution

The incidence of stroke was more in males (56%) than females (44%) in this study ( $P = 0.03$ ). The male to female ratio in the present study was 1.3:1. Details of sex distribution are shown in Table 1.

### Risk Factors

In the present study, the distribution of risk factors was as follows: Hypertension (70.97%), alcohol consumption (47.74%), diabetes mellitus (33.54%), smoking (28.38%), and elevated lipid profile (27.74%).

Among the patients with hypertension, 91.81% were known hypertensives and 8.18% were newly diagnosed as hypertensives. Among the patients with diabetes mellitus, a known history of diabetes was present in 96.29%, *de novo* diabetes seen in 3.70% patients.

Lipid parameters were raised in 28% patients. Details of risk factors are shown in Table 3.

### Clinical Presentation

Majority of the patients presented with hemiparesis (75.48%), whereas 5.8% with hemiplegia. Various other presentations observed were upper motor neuron (UMN) type of facial palsy (19.35%), followed by aphasia (5.8%), seizures (3.87%), and blurring vision (1.93%). The details of the clinical presentation are depicted in Table 4.

### Radiological Findings

In this study, commonly involved sites were capsuloganglionic region, cerebral lobes (frontal, parietal, and occipital), corona radiata, periventricular area, and cerebellum.

In ischemic stroke, capsuloganglionic region (43.66%) was the most commonly involved site of infarction followed by multiple areas of infarction (19.71%) and infarction of cerebral lobes (18.3%).

In hemorrhagic stroke, capsuloganglionic bleed (38.46%) was more common, followed by subarachnoid hemorrhage (23.08%), intracranial hematoma (15.38%), and cerebellar bleed (15.38%). The details of the involvement of various radiological sites are shown in Table 5.

### Clinical Care

Depending on the type of stroke, antiplatelet agents, statins, and hyperosmolar agents were prescribed. About 97.89% of ischemic stroke patients were treated by antiplatelet agents and 2.11% of patients by statins. Among antiplatelet agents prescribed, aspirin (66.2%) was the most common medication followed by clopidogrel (31.69%). All the

**Table 1: Basic characteristics of stroke patients**

Variables	Total sample	Ischemic stroke cases (I)	Hemorrhagic stroke cases (H)	P value (I vs. H)
No. of patients (n) (%)	155 (100)	142 (91.61)	13 (8.39)	<0.00001
Males (n) (%)	87 (56.12)	82 (57.75)	5 (38.46)	<0.00001
Females (n) (%)	68 (43.87)	60 (42.25)	8 (61.54)	<0.00001
P value (males vs. females)	0.03	0.09	0.23	
Mean age (SD)	60.22(11.83)	60.59(12.09)	56.15(7.69)	

**Table 2: Age-wise distribution of study patients**

Age group (in years)	No. of patients (n)	Percentage
21–30	1	0.65
31–40	9	5.81
41–50	21	13.55
51–60	52	33.55
61–70	46	29.68
71–80	21	13.55
81–90	5	3.23
Total	155	100

**Table 3: Distribution of risk factors for stroke**

Risk factor	No. of patients	Percentage
Diabetes		
Total sample	52	33.54
Known diabetics	50	96.29
<i>De novo</i> diabetics	2	3.70
Hypertension		
Total sample	110	70.96
Known	101	91.81
<i>De novo</i> hypertensives	9	8.18
Elevated lipid parameters	43	27.74
Smokers	44	28.38
Alcoholics	74	47.74

hemorrhagic stroke patients were managed by mannitol infusion.

The most commonly prescribed antihypertensive medications were calcium channel blockers (55.45%) followed by drugs acting on Renin-Angiotensin-Aldosterone System (RAAS) (30.91%) (angiotensin-converting enzyme inhibitors, and angiotensin receptor blockers) and beta-blockers (13.64%). Almost all diabetic patients were prescribed metformin (98.07%). The details of the treatment prescribed are tabulated in Table 6.

**DISCUSSION**

The most common age of presentation of stroke was 50–70 years in this study similar to other studies<sup>[5-7]</sup> which points to the fact that the probability of occurrence of stroke increases

with age. However, a little more than one-tenth of the burden of stroke was reported among the younger age groups (<45 years) which is a similar finding in the other studies.<sup>[5,8,9]</sup> Universally, male preponderance was noted in the occurrence of stroke.<sup>[5-10]</sup>

In this study, nine-tenths of the stroke patients were having ischemic and one-tenth of them were having a hemorrhagic stroke, a similar pattern of the type of stroke seen in other studies, but the percentages are different<sup>[5,7-11]</sup> except Shafi and Hakeem who reported a higher incidence of hemorrhagic stroke.<sup>[10]</sup>

Almost three-fourths of the cases were associated with hypertension in this study, which is the prime risk factor for stroke. However, a lower association (two-fifths) of hypertension was found in the other studies<sup>[5,6,8,9]</sup> except Shafi and Hakeem<sup>[10]</sup> who had a similar association and Swetha and Singh who had a much higher association (four-fifths).<sup>[7]</sup>

In this study, about one-third of the stroke cases were associated with diabetes mellitus in contrast to other studies<sup>[6,8,9,10]</sup> who showed a lower association (one-tenth) except Jebasingh and Sivanesan and Chitrambalam *et al.* who reported similar association and Swetha and Singh with a higher association (three-fifths).<sup>[5,7,12]</sup>

Elevated lipid parameters were noted in about one-quarter of the cases which was also reported in other studies.<sup>[5,8,10]</sup> However, Swetha and Singh showed hyperlipidemia in about two-fifths of the cases.<sup>[7]</sup>

A little more than one-quarter of the cases had a history of smoking; this finding was similar to the study done by Abbasi and Ali,<sup>[6]</sup> whereas a slightly lower number of smokers were reported in some other studies.<sup>[8,9]</sup> Jebasingh and Sivanesan and Shafi and Hakeem reported a higher percentage of smokers.<sup>[5,10]</sup>

Although the habit of smoking was low among the cases in the present study, almost half of them were alcoholics. However, most of the studies had a lower history of alcoholism in their cases.<sup>[5,6,8,9]</sup>

Hemiparesis (three-fourths of cases) was the most common presenting feature followed by UMN type of facial palsy (one-fifth) in the present study in contrast to the other

**Table 4: Pattern of clinical presentation in stroke patients**

Type of presentation	Total no. of patients	Percentage
Hemiparesis	117	75.48
Upper motor neuron palsy of facial nerve	30	19.35
Hemiplegia	9	5.8
Aphasia	9	5.8
Seizures	6	3.87
Blurring/loss of vision	3	1.93
Miscellaneous	8	5.16

**Table 5: Topographic distribution of stroke**

Sites involved	Ischemic stroke n (%)	Hemorrhagic stroke n (%)
Capsuloganglionic region	62 (43.66)	5 (38.46)
Multiple sites of infarction	28 (19.72)	0
Cerebral lobes (frontal, parietal, occipital)	26 (18.31)	1 (7.69)
Corona radiata	15 (10.56)	0
Infarction in periventricular area	15 (10.56)	0
Internal capsule	10 (7.04)	1 (7.69)
Caudate nucleus	3 (2.82)	0
Cerebellum	2 (1.41)	2 (15.38)
External capsule	2 (1.41)	0
Basal ganglia	1 (0.70)	0
Subarachnoid hemorrhage	0	3 (23.08)
Intracranial hematoma	0	2 (15.38)

**Table 6: Various medications prescribed for the management of stroke**

Medications	No. of patients	Percentage
<b>Ischemic stroke</b>	<b>142</b>	<b>91.61</b>
<b>Antiplatelets</b>	<b>139</b>	<b>97.89</b>
Aspirin	94	66.20
Clopidogrel	45	31.69
<b>Statins (Atorvastatin)</b>	<b>3</b>	<b>2.11</b>
<b>Hemorrhagic stroke</b>	<b>13</b>	<b>8.39</b>
Hyperosmolar Agents (Mannitol)	13	100
<b>Treatment of risk factors</b>		
<b>Hypertension – Anti-hypertensives</b>	<b>110</b>	<b>70.96</b>
Calcium channel blockers	61	55.45
Medication acting on RAAS (ACEI & ARB)	34	30.91
Beta blockers	15	13.64
<b>Diabetes mellitus – Anti-diabetics</b>	<b>52</b>	<b>33.54</b>
Insulin	1	1.92
Metformin	51	98.07

RAAS: Renin-Angiotensin-Aldosterone System, ARB: Angiotensin receptor blockers, ACEI: Angiotensin-converting enzyme inhibitors

studies where hemiplegia was the most common presenting feature.<sup>[5,8-10]</sup>

On radiological imaging, capsuloganglionic region was the most commonly involved area in both ischemic as well as hemorrhagic stroke cases by about two-fifths in each. Similarly, Jebasingh and Sivanesan also reported capsuloganglionic region (one-fifth) as the most commonly affected area.<sup>[5]</sup>

Among ischemic stroke cases, infarction in multiple areas followed by cerebral hemispheres was the next common sites of involvement in this study. However, studies done by Vaidya and Majmudar and Patne and Chintale reported the most common site of infarction as various lobes of cerebral hemispheres.<sup>[8,9]</sup>

Among hemorrhagic stroke cases in the present study, capsuloganglionic bleed and subarachnoid hemorrhage were the most common findings, whereas the bleed in the thalamic region was reported as the leading cause in the studies done by Vaidya and Majmudar and Patne and Chintale.<sup>[8,9]</sup>

None of the patients with ischemic stroke enrolled in this study were prescribed thrombolytic therapy which may suggest that none of them have presented in the time span for initiation of thrombolytic therapy (i.e., within 4½ h of onset of stroke).<sup>[13,14]</sup> Medications prescribed were to prevent the recurrence of stroke and comprised antiplatelet agents and statins.

Almost all the patients were prescribed antiplatelet agents (aspirin in two-thirds and clopidogrel in one-third). Swetha and Singh reported the use of anti-platelets in all their patients and a few of them indeed received a combination of two antiplatelet agents,<sup>[7]</sup> whereas Prathusha *et al.* and Abbasi and Ali reported use of single antiplatelet agents in about four-fifths and a slightly higher proportion of patients, respectively.<sup>[6,11]</sup> None of the patients in this study received anticoagulant therapy which is a similar finding in the study done by Swetha and Singh.<sup>[7]</sup> However, around half of the patients received anticoagulants in the studies done by Abbasi and Ali and Prathyusha *et al.*<sup>[6,11]</sup>

Prophylactic prescription of statins was very low in the current study in contrast to the other studies where statins were provided for about two-thirds<sup>[7,11]</sup> and one-fifth (Abbasi and Ali) of the patients.<sup>[6]</sup> Being a retrospective study, the reasons for not prescribing statins were unknown which requires further exploration in prospective studies.

The underlying risk factors were managed by antihypertensive and antidiabetic medications. A slightly higher than half of the hypertensives were prescribed calcium channel blockers in this study which is a common finding in other

studies too.<sup>[6,11]</sup> Medications acting on RAAS were prescribed in a higher proportion of hypertensives in the present study in comparison to others where only one-tenth of the cases received medications acting on RAAS.<sup>[6,11]</sup> About one-tenth of patients were prescribed beta-blockers in this study, similar to Abbasi and Ali.<sup>[6]</sup> However, in a study by Prathyusha *et al.*, a slightly higher proportion (about one-third) of hypertensives received beta-blockers.<sup>[11]</sup>

## CONCLUSION

Ischemic stroke is the most common type of stroke with increased occurrence in the age group of 5<sup>th</sup>–7<sup>th</sup> decade and male preponderance. Capsuloganglionic infarction or hemorrhage was the most common radiological finding with hemiparesis being the most common presentation. Antiplatelet agents (aspirin and clopidogrel) and mannitol were prescribed in ischemic and hemorrhagic stroke, respectively.

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**How to cite this article:** Punna S, Shailendra D, Mohammad AB, Balla KS, Joseph KA, Edem S, *et al.* Clinical profile of patients with stroke in a tertiary hospital setting in rural Telangana. *Natl J Physiol Pharm Pharmacol* 2020;10(06):473-477.

**Source of Support:** Nil, **Conflicts of Interest:** None declared.