How to Cite:
Dhruwa, C., & Naidu, A. (2022). Study on prevalence of CVA using non-invasive non-contrast ct scan in our population. *International Journal of Health Sciences*, *6*(S2), 11476–11481. https://doi.org/10.53730/ijhs.v6nS2.8074

Study on prevalence of CVA using non-invasive non-contrast ct scan in our population

Dr. Chandrashekhar Dhruwa
Associate Professor, Department of Radiodiagnosis, Shri Balaji Institute of Medical Sciences, Mowa Raipur

Dr. Avinash Naidu*
Associate Professor, Department of Radiodiagnosis, Shri Balaji Institute of Medical Sciences, Mowa, Raipur
*Corresponding author

***Abstract*---**Background: The burden of stroke is increasing in India; stroke is now the fourth leading cause of death and the fifth leading cause of disability. Previous research suggests that the incidence of stroke in India ranges between 105 and 152/100,000 people per year. However, there is a paucity of available data and a lack of uniform methods across published studies. Objectives of this study: The objectives of this study is to estimate the prevalence of stroke in our population. Materials and Methods: All the patients were subjected to a detailed clinical history, including risk factors, previous stroke, transient ischemic attack, physical examination including vital parameter assessment, serial neurological examination, other systems examination, computed tomography (CT) of brain. Concurrently, the patients were also worked up for complete hemogram, coagulation profile, and basic biochemical parameters. Statistical Analysis: Statistical analysis was done using Microsoft Excel spreadsheet, and statistical package for the social sciences (SPSS) version 20.0 software. Results were derived using frequency and percentage, mean and standard deviation. Results: It is evident from our study that the Ischemic stroke accounted for 76% of the total and haemorrhagic stroke accounted for 24% of the total stroke. We also found that Strokes within anterior circulation contributed to 78% when compared to posterior circulation which is about 22%. Discussion & Conclusion: The study shows that stroke is a major public health concern and A prospective community-based study is required to define the true magnitude and socio-demographic characteristics of stroke and the associated factors in the general population. Strategies for screening and management of hypertension, structural heart disease, and atrial fibrillation should be given priority as these are the most prevalent risk factors identified. An emergency care setup capable of early patient evaluation with appropriate Neuroimaging and

management of early stroke complications is crucial for prevention of early stroke-related mortality.

***Keywords*---**stroke, ischemic stroke, hemorrhagic stroke, computed tomography.

Introduction

Stroke, or cerebrovascular accident (CVA), is a clinical term that describes a sudden loss of neurologic function persisting for more than 24 hours that is caused by an interruption of the blood supply to the brain. [1-2] Stroke is the fourth most common cause of morbidity worldwide (after myocardial infarction) and is the leading cause of acquired disability.[3] Risk factors for ischemic stroke largely mirror the risk factors for atherosclerosis and include age, gender, family history, smoking, hypertension, hypercholesterolemia, and diabetes mellitus. Approximately 80-87% of strokes are from ischemic infarction due to thrombotic or embolic cerebrovascular occlusion.[3] Rapid evaluation of acute stroke patients will increase as the population ages and acute therapies expand. One significant aspect in the evaluation of acute ischemic stroke patients is imaging. Currently in the United States, noncontrast computed tomography (CT) remains the primary imaging modality for the initial evaluation of patients with suspected stroke.

CT is the first-line imaging modality used in neurologic emergencies owing to its speed, accurate depiction of acute intracranial disease, and availability. The critical role of nonenhanced CT for stroke evaluation began in 1996, when the U.S. Food and Drug Administration (FDA) approved intravenous tissue plasminogen activator (tPA) for clot thrombolysis.[4-6] Nonenhanced CT should be performed rapidly in patients with signs and symptoms of acute stroke to exclude intracranial haemorrhage (ICH) and identify large (ie, >100 mL or more than one-third of a brain territory at risk) well-established infarcts. However, the revised 2018 American Heart Association (AHA) guidelines state that the extent or severity of the hypo attenuation seen at CT should not be used as a criterion for withholding tPA owing to insufficient evidence. Early signs of proximal middle cerebral artery (MCA) large-vessel occlusive infarction seen at nonenhanced CT include loss of gray-white matter differentiation (GWD) at the insula, basal ganglia, and caudate head as well as sulcal effacement.[6-12]

Objectives Of The Study: The objectives of this study is to estimate the prevalence of stroke in our population.

Materials and Methods

Study site: This study was conducted at the Department of Imaging, S *Shri Balaji Institute of Medical Sciences, Mowa Raipur*

Study population

Patients referred to the radiology department for Dynamic MR imaging of the pelvis.

Study design

Observational cross-sectional Study

Sample size: included 200 subjects admitted in emergency medicine and medicine department.

Time frame to address the study

12 months for data collection and 2 months for statistical analysis of data.

Inclusion Criteria

All patients above the age of 18 years and all the having clinical and CT confirmed diagnosis of stroke.

Exclusion Criteria

Patients with age less than 18 years, stroke due to trauma, patients medical records which were not showing CT confirmed diagnosis, and stroke mimics i.e. seizure, intracranial tumour, migraine, metabolic encephalopathy.

Technique and Tools & **Data collection**

All the patients were subjected to a detailed clinical history, including risk factors, previous stroke, transient ischemic attack, physical examination including vital parameter assessment, serial neurological examination, other systems examination, computed tomography (CT) and magnetic resonance imaging (MRI) scan of the brain. Concurrently, the patients were also worked up for complete hemogram, coagulation profile, and basic biochemical parameters. Findings of brain CT scan of the brain performed within one week of the onset of stroke were used for classification of the type of stroke. Cerebral infarction was diagnosed based on typical imaging findings of infarct. Patients with cerebral infarction were further classified into lacunar infarct (defined as infarct measuring from 3 mm upto 2 cm on imaging of the brain) and non-lacunar infarct (defined as infarct measuring >2 cm on imaging of the brain). Intracerebral haemorrhage (ICH) or subarachnoid haemorrhage (SAH) was diagnosed based on clinical and CT scan findings.

Statistical Analysis

Statistical analysis was done using Microsoft Excel spreadsheet, and statistical package for the social sciences (SPSS) version 20.0 software. Results were derived using frequency and percentage, mean and standard deviation.

Results

This study includes 200 patients who came in the department of radio diagnosis, as Stroke patients in emergency medicine and general medicine department. Of the total 200 subjects 144 (72%) were males and 56 (28%) were females.

Table 1: Shows Age wise and gender wise distribution of study subjects

	Number of subjects	Males/females
>=30-40 years	3 (1.5%)	144/56
>=40-50 years	28 (14%)	
>=50-60 years	68 (34%)	
>=60 years	101 (50.5%)	
total	100	

Table 2: Distribution of subjects depending upon the type of stroke

	Number of subjects
Ischemic stroke	152 (76%)
Hemorrhagic stroke	48 (24%)

It is evident from the table 2 that Ischemic stroke accounted for 76% of the total and haemorrhagic stroke accounted for 24% of the total stroke. We also found that Strokes within anterior circulation contributed to 78% when compared to posterior circulation which is about 22%.

Discussion

The risk of stroke increases with age and the incidence doubles with each decade after 45 years. It can take time for the full implications of a stroke to sink in. It has a physiological, economical, and psychological impact on the patients. Approximately 20 million people each year suffer from stroke and of these 5 million do not survive. Older population-based studies in India conducted in Vellore and Rohtak quoted annual incidence of stroke as 13 per lac and 33 per lac persons, respectively.9,10 Strokes form nearly 1.5% of all hospital admissions, 4.5% of all medical, and 20% of neurological cases.11

Head CT remains an important investigative modality for patients with various neurological disorders. Among the commonest indication for CT scan evaluation is stroke. In this study, we performed CT scan imagining patterns among patients who underwent CT scans for clinical suspicion of Stroke. In the study, there was a male predominance among stroke patient's males making up 65% of the cases, this is in line with the researchers conducted in other parts of the country like Bahir dar, Hawassa and Addis Ababa as well as other researches are done in sub-Saharan African countries such as Nigeria, Cameron and western countries such as the USA and Europe.

The most common type of stroke In the study was ischemic stroke which is a comparable to similar studies conducted in Kenya, Zambia, Senegal, Nigeria showed higher incidences of ischemic stroke this is due to Demographic and Risk factors as the studies in which ischemic stroke was more common had an older mean age and increased incidence of certain risk factors such as diabetes, Alcohol & tobacco use as well as higher rates of HIV infections. The most common Risk factors seen in stroke Patients were Hypertension which was seen in around 40% of patients with ischemic stroke and 60% of patients with Hemorrhagic stroke, this finding is reproduced in all studies conducted in the country as well as other

African countries this may be because uncomplicated Hypertension is usually symptomless and patents may not be aware of their illness and even after diagnosis long term compliance will be an issues as patients might believe that they have been healed as soon as their symptoms disappear. The other established Risk factors of stroke such as Diabetes, smoking, Dyslipidemia were less common in this study than other studies.

The commonest location for Hemorrhagic stroke was the basal ganglia, thalamus, which accounted for 75% of the cases, these locations are common sites for hemorrhage secondary to Hypertension due to the branching pattern of the lenticulostriate vessels which supply these areas which are susceptible to rupture in cases of elevated blood pressure which was noted in these patients. Other identified sites of hypertensive bleeds are the cerebellum, internal capsule, and brainstem which accounted for around 9% of the cases. The comments locations of ischemic stroke were the cortical grey matter with 70% followed by the subcortical grey matter which accounted for around 20% of the cases while the rest of the cases were located in the brainstem and the cerebellum. This location is well described to be susceptible to infarcts due to the anatomy of the vessels.

Conclusion

The study shows that stroke is a major public health concern and A prospective community-based study is required to define the true magnitude and socio-demographic characteristics of stroke and the associated factors in the general population. Strategies for screening and management of hypertension, structural heart disease, and atrial fibrillation should be given priority as these are the most prevalent risk factors identified. An emergency care setup capable of early patient evaluation with appropriate Neuroimaging and management of early stroke complications is crucial for prevention of early stroke-related mortality.

References

1. Feigin VL, Forouzanfar MH, Krishnamurthi R, et al. Global and regional burden of stroke during 1990–2010: findings from the Global Burden of Disease Study 2010. Lancet 2014; 383: 245–255.
2. Global Burden of Disease 2017. Causes of death collabor- ators. Global, regional, and national age-sex-specific mor- tality for 282 causes of death in 195 countries and territories, 1980-2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet 2018; 392: 1736–1788.
3. Horton R and Das P. Indian health: the path from crisis to progress. Lancet 2011; 15: 181–183.
4. Sulaja S. Old age mortality in India? An exploration from life expectancy at age 60. Int J Asian Social Sci 2016; 6: 698–704.
5. Dalal P, Bhattacharjee M, Vairale J and Bhat P. UN millennium development goals: can we halt the stroke epidemic in India? Ann Ind Acad Neurol 2007; 10: 130.
6. Naik KR. Challenges in delivering stroke care in India. Ind J Health Sci Biomed Res (KLEU) 2016; 9: 245–246.

7. GBD 2016 Stroke Collaborators. Global, regional, and national burden of stroke, 1990–2016: a systematic ana- lysis for the Global Burden of Disease Study 2016. Lancet Neurol 2019; 48: 439–458.
8. Kamalakannan S, Gudlavalleti AS, Gudlavalleti VS, Goenka S and Kuper H. Incidence & prevalence of stroke in India: a systematic review. Ind J Med Res 2017; 146: 175–185.
9. Murray CJ, Ezzati M, Flaxman AD, et al. GBD 2010: a multi-investigator collaboration for global comparative descriptive epidemiology. Lancet 2012; 380: 2055–2058.
10. Kaur P, Verma SJ, Singh G, et al. Stroke profile and outcome between urban and rural regions of Northwest India: data from Ludhiana population-based stroke regis- try. Eur Stroke J 2017; 2: 377–384.
11. Pandian JD, Singh G, Bansal R, et al. Establishment of population-based stroke registry in Ludhiana city, Northwest India: feasibility and methodology. Neuroepidemiology 2015; 44: 69–77.
12. Pandian JD, Singh G, Kaur P, et al. Incidence, short- term outcome, and spatial distribution of stroke patients in Ludhiana, India. Neurology 2016; 86: 425–433.
13. Ray BK, Hazra A, Ghosal M, et al. Early and delayed fatality of stroke in Kolkata, India: results from a 7-year longitudinal population-based study. J Stroke Cerebrovasc Dis 2013; 22: 281–289.
14. Sridharan SE, Unnikrishnan JP, Sukumaran S, et al. Incidence, types, risk factors, and outcome of stroke in a developing country: the Trivandrum Stroke Registry. Stroke 2009; 40: 1212–1218
15. Sultan M, Debebe F, Azazh A, Hassen GW (2017) Epidemiology of stroke patients in Tikur Anbessa Specialized Hospital: Emphasizing clinical characteristics of Hemorrhagic Stroke Patients. Ethiop J Heal Dev. 31(1): 13-17.