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Research Article

A Prospective Observational Study on Risk Factors and Prescribing Patterns of Drugs used in Stroke Patients at a Tertiary Care Teaching Hospital.

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ABSTRACT

Objectives: The main aim of the study is to identify the different risk factors, prescribing patterns of medication and rationality of the prescription by observing the management of stroke patients carefully.

Methodology: A prospective and observational study was carried out for a period of 6 months in an in-patient department of a tertiary care hospital. Patients above 18 years of age, patients of either sex and patients who previously had stroke were included. Children below 18 years, pregnant women, AIDS patients, patients unable to respond to verbal questions with no caretakers and patients with head injury were excluded.

Results: A total of 100 prescriptions were analyzed during the 6 months study period. This was found to be higher in males (79) and females (21). The higher risk with notable occurrence in the age group of 60-79 years (43%). Out of these study populations, (68%) experienced Ischemic stroke and (32%) experienced Hemorrhagic stroke. The major risk factors were Hypertension (62%), alcoholics (41%). Smoking (33%) and Diabetes (24%). Among the 100 prescriptions, Atorvastatin was highly prescribed (96) followed by Pantoprazole (92), Mannitol (64). Out of 100 prescriptions, (67) were rational and (33%) were irrational.

Conclusion: The prescribing patterns of drug should be based on specificity and severity of stroke in order to facilitate rational use of drugs providing optimal care. Early management of hypertension and diabetes may reduce risk of stroke. Cessation of smoking and alcohol place a key role in prevention of stroke.

Keywords: Ischemic stroke, hemorrhagic stroke, hypertension, diabetes.

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INTRODUCTION

Stroke is defined by the World Health Organization (WHO) as a clinical syndrome consisting of rapidly developing clinical signs of focal (or global in case of coma) disturbance of cerebral function lasting more than 24 hours or leading to death with no apparent cause other than a vascular origin.¹

Stroke is a major cause of death and disability in India. The estimated adjusted prevalence rate of stroke range, 84-262/100,000 in rural and 334-424/100,000 in urban areas. The incidence rate is 119-145/100,000 based on the recent population-based studies. There is also a wide variation in case fatality rates with the highest being 42% in Kolkata.² The burden of stroke is heterogeneous and is greater among the elderly, men, and African-Americans.³ In China, 1.3 million people have a stroke each year and 75% live with varying degrees of disability as a result of stroke.³

Age, gender, race, ethnicity, and heredity have been identified as markers of risk for stroke. Although these factors cannot be modified. Some of the common modifiable risk factors are High blood pressure, Tobacco use, Diabetes, High cholesterol, Atrial fibrillation or other heart diseases, Certain blood disorders, Transient ischemic attacks, Cigarette smoking, Alcohol, Illicit drug abuse, Various lifestyle factors have been associated with increased stroke risk. Obesity has been associated with higher levels of blood pressure, blood glucose, and atherogenic serum lipids, which are independent risk factors for stroke.³

Ischemic stroke (caused by blood clots), Transient ischemic attack (TIA) (a "mini-stroke," caused by a temporary blood clot), Hemorrhagic stroke (caused by ruptured blood vessels) are the three main types of stroke.³

Ischemic stroke is an acute episode of focal cerebral, spinal, retinal dysfunction caused by infarction of central nervous

system tissue. Specifically, ischemic stroke includes embolic infarct, Thrombotic infarct and lacunar infarct. Transient Ischemic Attack (TIA) is a transient event, where arterial blockage in brain resolves on its own without causing any tissue death. Hemorrhagic stroke is an acute episode of focal or global cerebral or spinal dysfunction caused by intraparenchymal, intraventricular, or subarachnoid hemorrhage. Hemorrhagic stroke is of two types mainly; Intracerebral hemorrhage (ICH), Subarachnoid Hemorrhage (SAH).³

The study is carried out to create awareness among the physicians, nursing staff and patients regarding its risk factors and management. To assess the overall understanding of the drugs prescribed such as (Antiplatelets, Hypolipidemic drugs, diuretics, anticoagulants) and effectiveness of current inpatient stroke education practice by using the data from the patients and their caretakers. To focus on stroke patients and their caretakers by providing proper information on risk factors of the disease, early management and lifestyle modifications especially during post-stroke care at a tertiary care teaching hospital.

MATERIALS AND METHODS

A prospective and observational study was conducted at the department of General medicine, Osmania General Hospital. All the patients attending the department of general medicine with the complaints of stroke. The study was conducted for a period of 6 months on 100 patients diagnosed with stroke.

Inclusion criteria

Patients above 18 years of age were included in the study, patients of either sex, patients with history of stroke.

Exclusion criteria

Children below 18 years, pregnant women, HIV or AIDS Patient, patients who refused to be the part of the study, patients unable to respond to verbal questions with no caretakers, patient with head injury.

All the relevant and necessary data have been collected from patient’s case notes, patient’s prescription prescribed by the physician. Laboratory reports, Interviewing patient or patient caretaker (s) and health care professionals.

All the patients admitted at Osmania General Hospital were screened for the stroke. Each subject’s detailed history regarding age, sex, weight, socioeconomic status, rural or urban, history of hypertension, history of stroke and its treatment given, social habits and any comorbid conditions to be collected.

The selected patients were observed for signs and symptoms, presence of hemorrhage if any in the cerebrovascular region by CT Scan, motor functioning and improvement in the symptoms following the treatment.

RESULTS

In this study a total no. of 100 patients were studied during a period of six months. Out of 100 patients it was found that the majority of number of patients was male patients with 79% whereas the female patients constituted 21% of the total population as shown in figure 1.

GENDER DISTRIBUTION OF PATIENTS

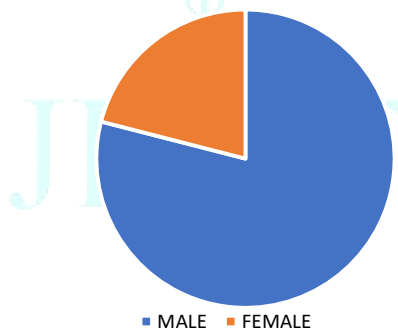


Figure 1: Gender distribution of the patient.

In the age distribution of the patients, it was found that the incidence of stroke was maximum in the age group 60-79 years which comprised of (43%) patients followed by the

age group of 40-59 years which comprised of (40%) of the entire study population as shown in table 1.

Table 1: Age distribution of the patients.

Age of the Patients	Male	Female	Total (%)
20-39	10	3	13 (13%)
40-59	31	9	40 (40%)
60-79	37	6	43 (43%)
>80	1	3	4 (4%)

Out of the study population, 68% patients were diagnosed as ischemic stroke and 32% were diagnosed as hemorrhagic stroke as shown in figure 2.

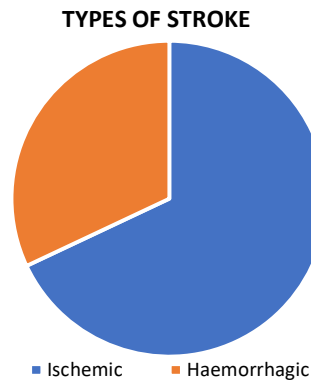


Figure 2: Types of stroke.

Out of the total study population, the majority of the subjects had a risk factor of hypertension, followed by Alcohol, smoking, diabetes and other factors as shown in table 2.

Table 2: various risk factors and co-morbidities associated with the stroke patients.

RISK FACTORS	NUMBER OF PATIENTS (%)
HYPERTENSION	62 (62%)
ALCOHOL	41 (41%)
SMOKING	33 (33%)
DIABETES	24 (24%)
EPILEPSY	5 (5%)
ASSOCIATED CARDIAC PROBLEMS	7 (7%)
PULMONARY DISEASES	3 (3%)
OTHERS	14 (14%)
OLD CVA	8 (8%)

Most common drug prescribed in hospitalized stroke patients were Supplements, Antibiotics, Antacids, followed by Antihypertensive agents and Lipid lowering agents as shown in the table 3 and figure 3 representing the graph.

Table 3: Groups of drugs prescribed in stroke patients.

GROUP OF DRUGS	Number of drugs prescribed to patients with (%)
Supplements	111 (13.48%)
Antibiotics	107 (13.00%)
Antacids	106 (12.87%)
Antihypertensives	101 (12.27%)
Lipid Lowering agents	96 (11.66%)
Others	77 (9.35%)
Antiplatelet	73 (8.86%)
Diuretic	70 (8.50%)
Antiemetic	27 (3.28%)
Antiepileptic	25 (3.03%)
Antidiabetic	22 (2.67%)
Anticoagulant	8 (0.97%)

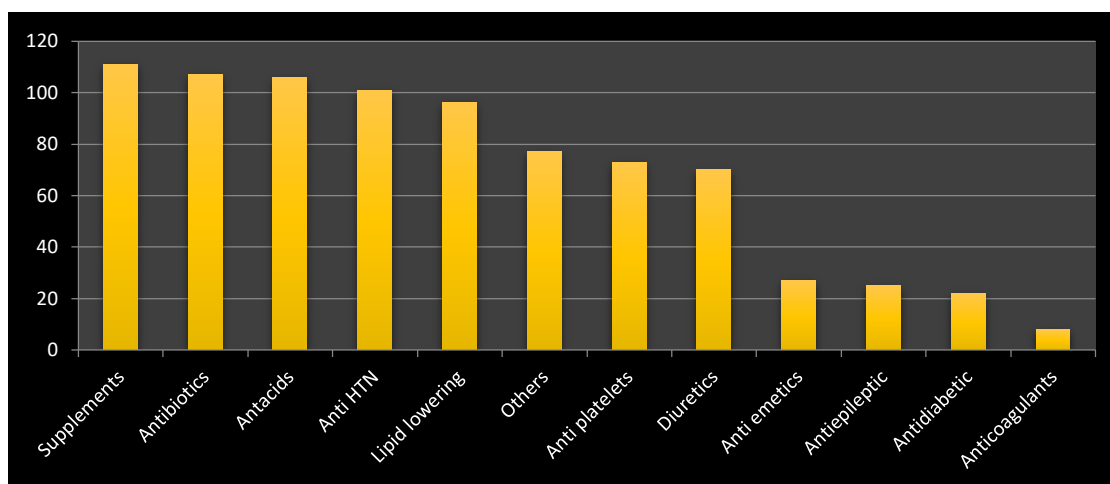


Figure 3: Groups of drugs prescribed to the patients.

The most common drugs prescribed in hospitalized stroke patients were Supplements, Antibiotics, Antacids followed by Antihypertensive agents and Lipid lowering agents as shown in table 4.

Table 4: Individual agents in each category of drugs prescribed in patients.

TYPES OF DRUGS	NO. OF DRUGS (%)
ANTIHYPERTENSIVES:	Total = 101 (12.27%)
Beta Blockers (Metoprolol, Labetalol)	12
Calcium channel blockers (Amlodipine, Nifedipine)	51
ACE Inhibitors (Enalapril)	25
Angiotensin Receptor Antagonist (Telmisartan)	13
LIPID LOWERING AGENTS:	96 (11.66%)
Atorvastatin	
ANTIPLATELET AGENTS:	Total = 73 (8.86%)
Aspirin	61
Clopidogrel	12
ANTICOAGULANTS:	Total = 8 (0.97%)
Heparin	5
Enoxaparin	3
ANTIEPILEPTICS	Total =25 (3.03%)
Phenytoin	24
Valproic acid	1
PPI & ANTACID MEDICATION:	Total =106 (12.87%)
Pantoprazole	92
Ranitidine	14
DIURETICS	Total = 70 (8.50%)
OSMOTIC DIURETIC	64
Mannitol	
LOOP DIURETIC (Furosemide)	6
ANTIEMETICS	Total = 27 (3.28%)
Ondansetron	22
Metochlopramide	5
ANTIDIABETIC	Total = 25 (2.67%)
Insulin	19
Metformin	3
ANTIBIOTICS	107 (13.0%)
SUPPLEMENTS	111 (13.48%)
OTHERS	77 (9.35%)

Out of total prescriptions the majority of prescriptions were rational which is 67% and remaining were irrational which is 33% as shown in table 5.

Table 5: rationality of the prescription.

Rationality	No. of Prescriptions	Percentage
Rational	67	67%
Irrational	33	33%

DISCUSSION

An observational study was carried out on risk factors and prescribing patterns of drugs used in stroke patients. Out of 100 stroke patients, 79% were males and 21% were females which is similar to the previous study conducted by nikhat et.al (2018).⁴

The incidence of stroke was high among the age group of 60-79 years (43%) followed by 40-59 years of age (40%) which is similar to the previous study conducted by K. Soumya Lakshmi et.al (2018), stating that stroke is more common among the age group of 40-80 years.⁵

After examining the subjects based on the types of Strokes, it was found that majority of the patients suffered an ischemic stroke (68%) followed by hemorrhagic stroke (32%) which is similar to a previous study conducted by Mohammed Yaseen Abbasi et.al (2012)⁶ stating that most of the patients suffered an ischemic stroke .

In the present study, it was found that most of the subjects were hypertensives (62%) which is a major risk factor for development and progression of stroke followed by alcoholics (41%), addicted to smoking (33%) & diabetics (24%) which is in accordance with other studies conducted by Spurthi et.al (2016)⁷, stating that most of the subjects with stroke are hypertensive.

After analyzing the overall list of medications that were prescribed among 100 prescriptions , it was found that the most consumed category of drugs were Supplements (13.48%), Antibiotics (13.0%), Antacids / PPI (12.87%), followed by Antihypertensive agents (12.27%) and Lipid lowering agents (11.66%). For Risk Factors like Hypertension, Calcium channel blockers like amlodipine were the most prescribed followed by ACEIs like enalapril and ARBs like Telmisartan followed by Beta Blockers like Metoprolol, Labetolol, Propanolol. The prescribing patterns of drugs revealed that among the number of 100 prescriptions, Atorvastatin was highly prescribed drug (96) followed by Pantoprazole (92), Mannitol (64), Aspirin (61) and Calcium channel blockers: Amlodipine/Nifedipine (51), and others in accordance with other studies conducted by subhransu et.al (2018).⁸

The present study reveals the prescribing pattern of drugs used in the treatment of stroke stating that most of the subjects were admitted with ischemic stroke followed by Hemorrhagic stroke in accordance with previous study conducted by vurumadla et.al (2014).⁹ Drugs prescribed for the treatment of stroke were according to AHA/ASA guidelines. Antihypertensive were the major class of drugs preferred for the improvement of risk factors as they lower the blood pressure in hemorrhagic stroke and lowers the risk of recurrent stroke. Lipid Lowering Agents and Antiplatelet drugs were the most common drugs used for prevention of clot formation.

Out of 100 prescriptions, 67% were rational as they were given in accordance with the AHA/ASA guidelines and 33% were irrational due to the number of severe drug interactions between them.

According to the AHA/ASA guidelines, CT/MRI are the standard diagnostic test for the detection of different type of stroke performed at the time of admission in the ER at the study site.

CONCLUSION

In the present study, a sample size of 100 stroke patients were evaluated based on the prescribing pattern of drugs used in the treatment of different types of stroke stating that most of the subjects were admitted with Ischemic stroke. In our study, we observed that the incidence of stroke was more common in males than females. Severity of stroke was based on, risk factors and symptoms. Various classes of drugs prescribed were Antihypertensives, Lipid lowering Agents, Antiplatelets, Diuretics, Antiemetics, Antiepileptics, Antidiabetics, Anticoagulants, Supplements, Antibiotics, Antacids. Drugs prescribed for the treatment of stroke were according to AHA/ASA guidelines. Antihypertensives, Osmotic Diuretic, Lipid Lowering agents, Antiplatelets were the major class of drugs preferred for the improvement of symptoms. Atorvastatin was the most commonly prescribed drug for treating dyslipidemia.

CT/MRI which is a standard test for the diagnosis of Stroke was performed in this study, according to AHA/ASA guidelines. In our study, we found that there were few severe drug interactions by co-administering the drugs like (Aspirin + Enalapril) it is advisable to change the time of Administration. The drugs (Nifedipine + Phenytoin) resulted in severe drug interactions therefore it is advisable to withdraw the medication or use of alternate drug. It was found that 33% of prescriptions were irrational which has shown atleast one serious drug-drug interaction potentially leading to renal impairment. Majority of the prescriptions were rational (67%) and were in accordance with the AHA/ASA guidelines.

The findings in our study stress the need for early and appropriate management of stroke to prevent further complications of stroke. Physiotherapy, lifestyle changes and better management of risk factors have a major effect on recovery of stroke with improve quality of life and symptoms.

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