

To evaluate the prevalence and drug prescribing trends in stroke patients: A retrospective study

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ABSTRACT

Stroke is a major public health challenge, which is a devastating and disabling disorder not only for neuropharmacology but the society in general. This study was conducted to describe and obtain the baseline data about the prevalence, complaints during admission, risk factors associated and prescribing pattern of drugs in stroke patients. A retrospective study was conducted in a tertiary care hospital over a period of three months. The pharmacological therapy prescribed was analysed to determine the prescribing pattern of drugs in a total of 45 patients. It was observed that the prevalence of ischemic stroke (60%) was found to be greater as compared to that of the hemorrhagic stroke (40%). The incidence of stroke was estimated higher in males (69%) as compared to females (31%). Hemiplegia (18%) and slurred speech (16%) were the prominent manifestations for admission of patients which .The occurrence of stroke was predominantly seen at the age of 51-60 years (27%). The common risk factor for stroke is hypertension, smoking (29%) and alcoholism (16%). The current prescribing trends were antihypertensive (32%) followed by antiplatelet (14%) neuroprotective (10 %) and nootropics (8%). The prescribing trends for antihypertensive drugs in stroke were antidema (23%), ACE inhibitors (20%), beta blockers (16%), calcium channel blocker (14%) followed by other antihypertensives. The prescribing pattern of drugs should be based on specificity and severity of stroke in order to facilitate rational use of drugs providing optimal care. Pharmacists are in a key position to provide pharmaceutical care to stroke survivors and initiate or recommend appropriate pharmacotherapy where indicated. Integration of a role of pharmacist in the management of stroke is crucial and improves outcomes of patients.

Keywords: Stroke, Risk factor, Prescribing pattern, Prevalence, Hypertension.

1. INTRODUCTION

Stroke is a major cause of mortality worldwide and commonly occurs in elderly patients¹. After coronary heart disease (CHD) and cancer of all types, stroke is the third commonest cause of death worldwide^[1-15]. In India, the ICMR estimates in 2004 indicated that stroke contributed 41% of deaths and 72% of disability adjusted life years amongst the non-communicable diseases. WHO has defined stroke as "rapidly developing clinical signs of focal or global disturbance of cerebral function, lasting for more than twenty four hours or leading to death, with no apparent cause other than vascular origin^[3]." Epidemiologic studies on stroke help us with understanding the natural history of the disease, identification of risk factors, and prognostic

factors that can lead to markers for disease mechanisms. According to the recent studies conducted stroke was defined to be highly prevalent condition exacts a substantial societal toll in the form of the "Dreaded-D's," which are the leading cause of chronic disability, the second leading cause of dementia, and the fourth leading cause of death in the United States^[4].

Drug utilization study using prescribing indicators enables us to detect and also to quantify problems in prescribing practices. Such study helps to frame appropriate interventions based on type of problems and ultimately promotes rational use of drugs in the community.

Stroke is a clinical syndrome divided into two broad categories that define its pathophysiology:

- Ischaemic strokes are caused by sudden occlusion of arteries supplying the brain, either due to a thrombus at the site of occlusion or formed in another part of the circulation. It account for 50%–85% of all strokes worldwide.
- Haemorrhagic strokes are caused by subarachnoid haemorrhage – bleeding from one of the brain’s arteries into the brain tissue or intra-cerebral haemorrhage - arterial bleeding in the space between meninges. This category of stroke account for 1%-7% and 7%-27% respectively of all strokes worldwide.

According to the demographic data obtained the prevalence rate of stroke increases from 0.1-0.3/1000 in the < 45 year age group to 12-20/1000 in the 75-84 year age group. Similarly, the incidence rates increase from 27-34/100,000 in the 35-44 age groups to 822-1116/100,000 in the 75+ age group.

Stroke prevalence ^[12] among the elderly in rural India was 1.1% and urban India was 1.9%. Prevalence is directly proportional to age and inversely proportional to the education levels of stroke survivors. Three transitions have contributed to the emergence of the stroke epidemic in India: demographic, lifestyle and socioeconomic. Non-modifiable stroke risk factors ^[16,17] include, age, sex, low birth weight, ethnicity and genetic factors. According to the recent studies conducted It was found that modifiable risk factors ^[14] such as hypertension (40%), alcoholism (35%), smoking (28%) and hyperlipidemia (17%) are the commonest cause of stroke among the elderly. Smoking, alcoholism, increased BMI, diabetes and hypertension are significantly associated with strokes among young people. The presence of coronary artery disease and large artery atherosclerosis are also considered the strong predictors of a new vascular event among the stroke survivors.

Currently the awareness regarding the diagnosis of stroke is through the FAST examination (which adopts weakness of face, arm as well as speech and essentially time). The other means of diagnosis are CT scan, MRI scan, PET and ultra sound.

According to NICE guidelines 2011, early recognition and diagnosis of stroke using validated tools outside hospital environment can help save life and limit disability. Proven treatments of acute thrombotic stroke include intravenous thrombolysis within 3 hours of onset of symptoms, use of aspirin within 48 hours and decompressive surgery for malignant middle cerebral artery infarction. The drug treatment

strategy is involved with selecting drugs like thrombolytics, anticoagulants, antihypertensives (angiotensin converting enzyme-inhibitors, angiotensin II receptor blockers, and diuretics), blood lipid lowering agents (statins), antiplatelet drugs (aspirin and clopidogrel), and cerebral activators. It is also recommended to select, a route, and dosage form of drugs to have optimal therapeutic effects to manage cerebrovascular accident.

Primary management of stroke includes antiplatelet therapy with aspirin, statin therapy and blood pressure management. Secondary management with carotid endarterectomy, carotid angioplasty, warfarin and heparin is useful. Calcium antagonists like oral nimodipine is useful in hemorrhagic stroke.

Primary prevention interventions are expected to target at behavior modification such as reduced smoking, alcohol and salt consumption patterns and increased physical activity. Increasing fruit and vegetable consumption (for each 1-serving per day) is considered to reduce the risk of stroke by 6%. Secondary prevention is through the pharmacological therapy. Tertiary prevention is attributed to maintain their ability to carry out daily activities if they receive rehabilitation services at home. Stroke rehabilitation is expected to begin as soon as possible after a person has a stroke and continue for as long as it is clinically appropriate ^[11].

Stroke related programmes in India are WHO steps programme , inter -stroke, The Indian Stroke Prospective Registry (INSPIRE), The Prospective Urban Rural Epidemiology (PURE), National Programme on prevention and control of cardio-vascular diseases, diabetes and stroke (NPCDCS), Indian Council of Medical Research (ICMR), stroke policy in India.

1.1. Aim

The main purpose of the study was to estimate the prevalence, to determine the identifiable risk factors, complaints during the admission and to evaluate the current prescribing trends n stroke patients.

2. METHODOLOGY

A descriptive retrospective observation study of analysing 45 prescriptions in a tertiary care hospital at erode over a period of 3 months for analysing the prevalence, identifiable risk factors, complaints during admission and prescribing trends of drugs in stroke patients. A preliminary literature survey was done in order to support the study proposed and this will be continued throughout the study period to update the knowledge about the current topic and other

related topics. The data obtained was collected through interviewing the patients or other care giver. Details regarding the prescribed drugs were obtained through analysing patient case report and through clarification by the attending physician.

Patients were selected and excluded according to the specific criteria mentioned. Patient were selected on basis of age Group > 20 yrs, patients of both gender ,patients with Hypertension, Patients receiving antihypertensive drugs with combinations , Alcoholic and non-alcoholic, Smokers & non-smokers, patients with stroke and excluding all other co-morbid disease. Patients were excluded on basis of patients of age < 18 yrs, pregnant/lactating women, patient with hepatic disorder, Patient with intracranial abnormalities.

3. RESULTS AND DISCUSSION

On the basis of the study conducted on a tertiary care hospital for 3 months the following results were obtained. The prevalence of ischemic stroke (60%) was found to be greater as compared to that of the hemorrhagic stroke (40%) (Figure 1). The incidence of stroke was estimated higher in males (69%) as compared to females (31%) (Figure 2). Hemiplegia (18%) and slurred speech (16%) were the prominent manifestations for admission of patients which is then followed by drowsiness (5%), numbness and tingling sensation, weakness of right side (7%), vomiting (10%), giddiness (9%), headache and dysarthria (8%)(Figure 4). The occurrence of stroke was predominantly seen at the age of 51 - 60 years (27%) followed by 41 -50 years (22%) (Table 1) (Figure 5). The study conducted observed that the major and common risk factor for stroke is hypertension. The distribution of patients on the basis of different stages of hypertension according to JNC guidelines 7 was calculated and the patients mainly belong to the stage I category with (40 %) followed by stage II category (27%) (Table 2) (Figure 6). Smoking (29%) showed higher rate of incidence as compared to either alcoholic (16%) nor both (22%) (Figure 3).

The current prescribing trends were evaluated the commonly prescribed drugs for stroke were antihypertensive (32%) followed by antiplatelet (14%) neuroprotective (10%) and nootropics (8%) (Table 4) (Figure 7). The prescribing trends for antihypertensive drugs in stroke were antidema (23%), ACE inhibitors (20%), beta blockers (16%), calcium channel blocker (14%) followed by other antihypertensives (Table 5) (Figure 8).

According to Abdul Naveed, Shreya et al [1] the types of stroke, ischemic stroke (82.26%) was the major type of stroke suffered than haemorrhagic stroke (17.74%). Similar results were obtained in study conducted by Celin et al[5] that revealed 86.12% Ischemic stroke and 13.88% Haemorrhagic stroke patients. Another study done by Robert et al[6] showed 85% Ischemic stroke and 15% Haemorrhagic stroke patients. Esther cahane et al[7] concluded that in a total stroke series 42% had hypertension. The prevalence of hypertension in stroke was found higher in male patients with age above 40 years.

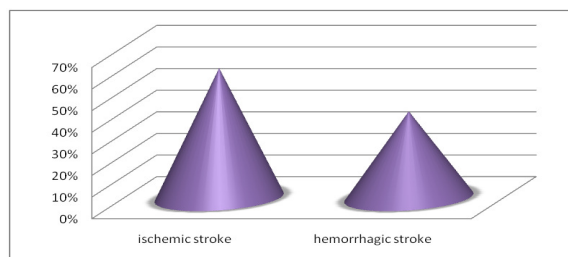


Figure - 1: Prevalence of types of stroke among patients.

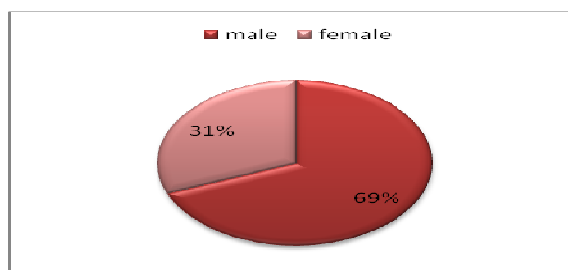


Figure - 2: Percentage of distribution of male and female.

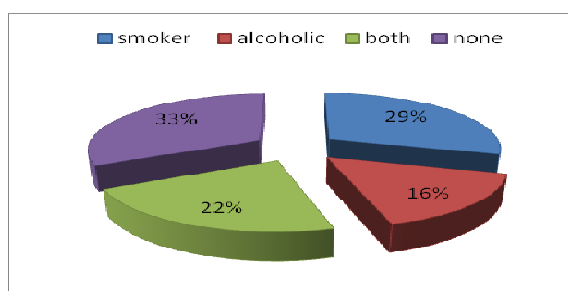


Figure - 3: Percentage distribution on basis of social habits.

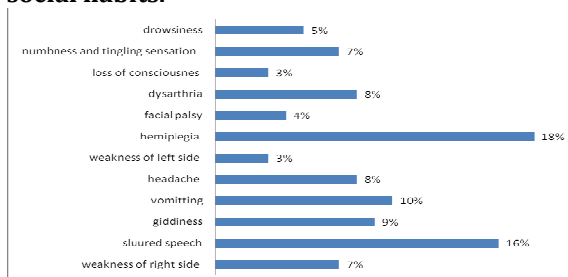


Figure - 4: Percentage of patients based on reason for admission.

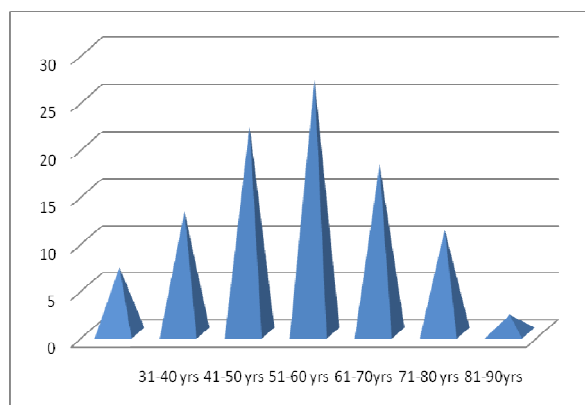


Figure - 5: Percentage of Age distribution among stroke patients.

Table -1: Percentage of Age distribution among stroke patients

Age distribution (in years)	Number of patients under each age group	Percentage distribution
20-30	3	7
31-40	6	13
41-50	10	22
51-60	12	27
61-70	8	18
71-80	5	11
81-90	1	2

According to Ann Blomstrand et al Hypertension, smoking, AF, diabetes and high BMI were associated with increased stroke risk [9]. In stroke patients, 11% patients have normal blood pressure level, 22% patient having

prehypertensive, 40 % patients having stage I hypertension, 27% patients having stage II hypertensive have been analysed (Table 2).

According to Mo-Yeol Kang et al suggest that both voluntary retirement and involuntary job loss increase the risk for stroke or cardiovascular disease in middle-aged to older individuals, especially males [8]. Males (69%) has more prevalence than women (31%).

Silverman et al concluded that various drugs prescribed in stroke patients such as anticoagulants, anti platelet drugs, dyslipidemics, anti-hypertensives, neurotonics. Drugs to be administered for conditions occurring after the initial event (depression, dementia, epilepsy) like anti epileptics, anti psychotics, CNS stimulants were also prescribed for the patients [10,13]. Mostly antihypertensive drugs were prescribed, also antiplatelet, analgesics, antibiotics, anticonvulsants, nootropics, neuroprotective agents, anti depressants vitamin supplements should be prescribed.

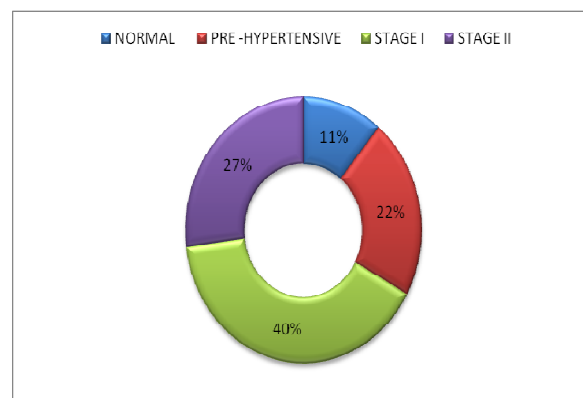


Figure - 6: Stage II category

Table - 2: Percentage distribution of patients with different stages of hypertension

Stages of hypertension	Range (mmHg)	Patient distribution	Percentage distribution
Normal	120/80	5	11
Pre- hypertensive	120-139/80-89	10	22
Stage I	140-149/90-99	18	40
Stage II	>160/100	12	27

Table - 3: Distribution of drugs prescribed in a prescription

Prescription	Number of drugs prescribed	Percentage distribution
15	4 drugs	33%
6	5 drugs	13%
4	6 drugs	9%
9	7 drugs	20%
11	>7 drugs	24%

Table - 4: Pattern of prescribing drugs in stroke patients

Drugs prescribed	Number of drugs prescribed	Percentage of drugs prescribed
Antihypertensive	70	32%
Anticonvulsants	13	6%
Analgesics	10	5%
Antibiotics	20	9%
Anticoagulants	16	7%
Antidepressants	8	4%
Neuroprotectives	21	10%
Vitamin supplements	14	6.5%
Nootropics	18	8%
Antiplatelets	32	14%

Table - 5: Pattern of prescribing antihypertensive drugs among stroke patients

Anti hypertensive drugs prescribed	Number of drugs prescribed	Percentage of prescribed drugs
Diuretics	7	10%
Antiodema	16	23%
ACE inhibitors	14	20%
Angiotensin receptor blocker	9	13%
Beta blockers	11	16%
Nitrates	3	4%
Calcium channel blocker	10	14%

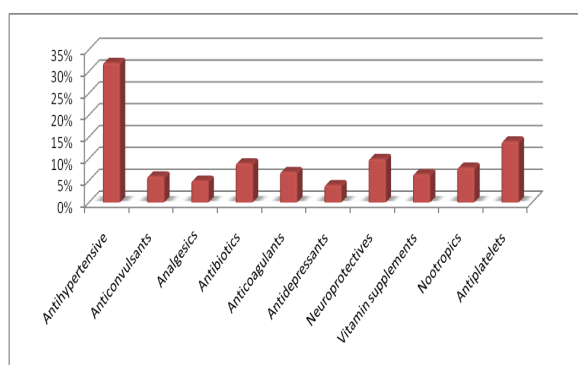


Figure - 7: Pattern of prescribing drugs in stroke patients.

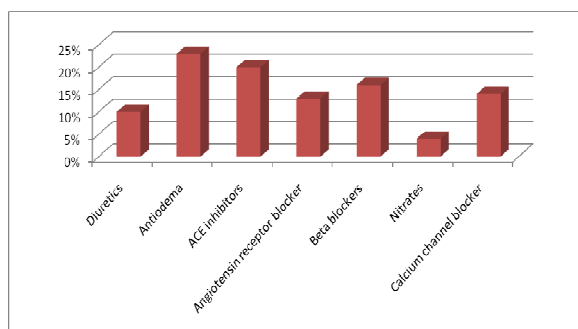


Figure - 8: Pattern of prescribing antihypertensive drugs among stroke patients.

4. CONCLUSION

The study showed prevalence, various aspects affecting stroke prevalence and drug utilization review of stroke patients. According to the study the prevalence of ischemic stroke was higher as compared to hemorrhagic stroke. The incidence was seen higher in males with age group of 51-60 years. The major clinical manifestation associated with stroke was hemiplegia and slurred speech. The common risk factor for stroke is hypertension, smoking, alcoholism. The study also reported the prescribing trends of antihypertensive, antiplatelet, neuroprotectives and nootropics. The usage of drugs differs with hospitals and physicians. The prescribing pattern of drugs should be based on specificity of the condition and severity of stroke in order to facilitate rational use of drugs providing optimal care. Therefore, Standard Stroke Prescribing Guidelines should be adopted in India to provide rational therapy.

5. REFERENCES

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