RESEARCH ARTICLE

Pharmacoepidemiological Study on Cerebrovascular Accident in Tertiary Care Hospital

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ABSTRACT

Stroke is the third leading cause of death in the United States (US) and a leading cause of serious, long-term disability. Incidence of ischemic stroke is higher than hemorrhagic stroke. The aim is to conduct pharmacoepidemiology study on cerebrovascular accident patient by evaluating the use and the effects of drugs, and quantification of adverse drug reactions, drug utilization studies to improve the quality and use of medicines. A prospective observational study was conducted in department of general medicine and ICU at Mallareddy hospital, data was collected from 130 patients and it was proposed to be conducted for 6 months. Among 130 patients 78(60%) are males and 52(40%) are females. Among all age groups major number of CVA patients was seen in 60-69 years (30%). Among them 92% of strokes are Ischemic majorly seen in both males and females and8% strokes are hemorrhagic. Ischemic stroke (94.87%) is majorly seen in 60-69 yr age group. Among various risk factors Hypertension (36.43%) is the major risk factor found in males (60%) and females (40%).Antiplatelet drugs (25.75%) are the highest number of drugs given in patients 71.27% in males and 28.72% in females. Highest numbers of drugs are given in 50-59yrs age group and are antiplatelets. As a clinical pharmacist 16 adverse drug reactions and 25 drug interactions are reported. Proper patient counselling is needed to reduce hypertension and to reduce the risk for cerebrovascular accident. Among all antiplatelet drugs are majorly given in males and lipid lowering drugs in females.

KEYWORDS

Hypertension, Hemorrhage, Diabetes Mellitus, Cerebrovascular Accident, Adverse Drug Reactions

INTRODUCTION

Cerebrovascular accident is a medical term for stroke and is classically characterized as a neurological deficit attributed to an acute focal injury of the central nervous system (CNS) by a vascular cause, including cerebral infarction, intracerebral haemorrhage (ICH), and subarachnoid haemorrhage (SAH), and is one of the most common leading causes for disability and death worldwide.

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According to the Global Burden of disease study, in 2002 it was estimated that cerebrovascular disease (stroke) accounted for 5.6 million deaths worldwide, equivalent to 9.7% of all deaths. Two –thirds of these deaths occurred in people living in developing countries and 43% of the subjects were aged less than 70 years. The incidence of ischemic is higher than hemorrhagic stroke[1]. A number of epidemiological studies have investigated various risk factors for stroke such as hypertension, diabetes mellitus, alcohol, smoking etc. Drug utilization studies which evaluated, analyzed the medical, social outcomes of the drug therapy observe the prescribing

pattern of drugs in stroke patients. This utilisation studies in developing countries stress a number of related problems, healthcare infrastructure is inadequate. This is a part of programme to improve the quality and use of medicines, designing interventions to improve prescribing pattern of drugs and quantification of adverse drug reactions and drug interactions[2].

Drug utilisation review (DUR) evaluate the commonly prescribed drugs, use and effect of drugs in cerebrovascular accident patient. According to the World Health Organization definition of Adverse drug reaction is a noxious, unintended reaction which occurs at doses used in humans for treatment, diagnosis and prevention of disease and therapy. Pharmacoepidemiology study is a bridge science of both pharmacology and epidemiology will give information on incidences of stroke and utilisation pattern of drugs.

MATERIAL AND METHODS

Ethical Considerations

The study protocol was prepared and approved by Human Ethics Committee of Malla Reddy Institute of Pharmaceutical Sciences. Informed consent forms were collected from the entire study subject and were written in local language for better understanding of the study participants.

The Study Settings and Study Population

The study was a prospective, observational study and it was conducted for 6 months from November 2015 to April 2016 in department of General Medicine and ICU in Malla Reddy hospital and Narayana Hrudayalaya hospital. This was 300 bedded Multi-specialty hospital and the study population includes patients with cerebrovascular accident and other co morbidities and age group of 30-90 years old with both genders. Data was collected from 130 cerebrovascular accident patients.

Study Design

A total of 130 patients were enrolled in this study. This was a prospective observational study. Data were collected through a predesigned, well structured data collection form:

the data collection majorly focused on different characteristics like (1) age, gender (2) Past medical and medication history, family history and any recurrent history of stroke 3) social history including smoking, Gutkha habits, and alcohol/toddy consumption. 4) Mainly focused on drugs which are prescribed for Cerebrovascular accident.

Data Management and Analysis

The data was collected in a pre designed data collection form and reviewed systematically. All the data were subjected to descriptive and differential statistics by using latest version of GRAPHPAD PRISM software VI.

RESULTS AND DISCUSSION

We conducted a prospective observational study on cerebrovascular accident patients in evaluation of use and effects of drugs and drug utilization studies for better patient care.

Age and Gender

On the basis of inclusion and exclusion criteria 130 patients were selected for the present study from general medicine and ICU ward over a period of 6 months. Among them males are higher in number than females as shown in Figure 1. Highest number of CVA patients was seen in 60-69 years age group (30%) others were shown in Figure 2. this study is similar with the reference[4].
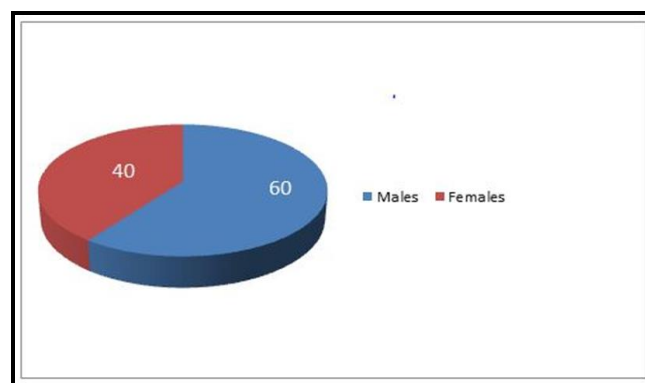

Figure 1: Percentage of CVA Patient's Distribution according To Gender

Types of Stroke

Types of stroke according to gender were distributed among the patients, in which ischemic

stroke is majorly reported in males with (94.87%) and females with (84.46%). In overall 92% of strokes are ischemic majorly seen in both males and females and 8% of strokes are hemorrhagic as shown in Figure 3 this study is similar with the reference[5].
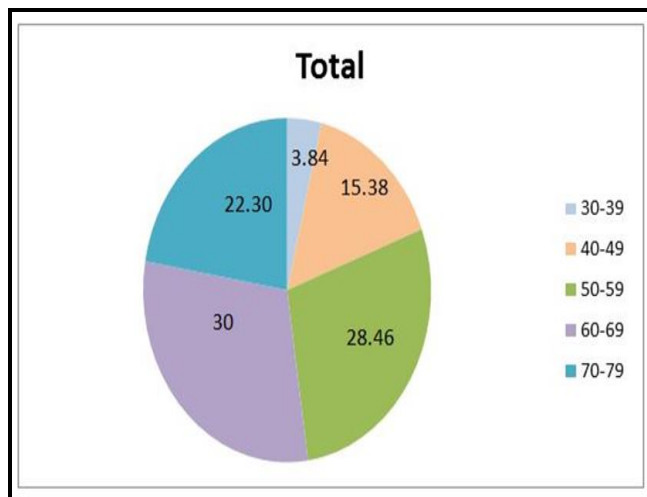

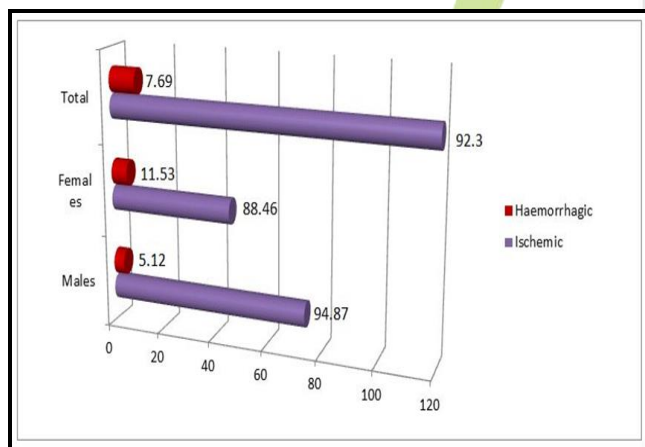Figure 2: Percentage of CVA Patient's Distribution according To Age

Figure 3: Types of Stroke Distribution According To Gender

Risk Factors & Other Disease Factors

There is various risk factors like hypertension, diabetes mellitus, hyperlipidemia, alcohol/toddy consumption are the leading cause of stroke. Our study evaluated that Hypertension (36.43%) is the major risk factor found in males (60%) and females (40%) and hyperlipidemia (26.72%) is the second major risk factor were shown in Table 01 this is similar with the study[6,7]. In other diseased factors/co morbid conditions according to the age group, majority were seen in 60-69yr

age i.e. 39 and second majorly 37 patients are seen in 50-59 yr age group as shown in Table 02.

Drugs Distribution According to Gender and Age

Drugs like antiplatelets, lipid lowering drugs, psychostimulants, anticoagulants, antihypertensives and antiepileptics are commonly prescribed drugs for the treatment of stroke. Among these classes of drugs, according to gender Anti platelet drugs (25.75%) are the highest number of drugs given to the patients 71.27% in males and 28.72% in females. Next to this, lipid lowering drugs (24.38%) are given mostly and were shown in Figure 4, this is similar with study reference[8,9]. Drugs distributions according to age group, highest numbers of drugs are given in 50-59 years age group and are anti platelets. These are shown in Table 3.
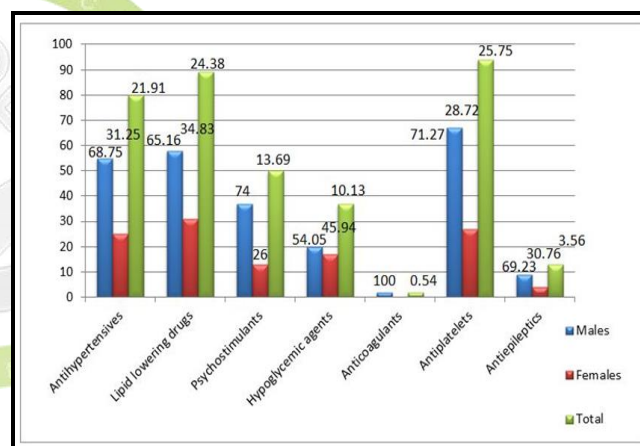

Figure 4: Drugs Distribution According To Gender

Adverse Drug Reactions and Drug Interactions

As a clinical pharmacist 16 Adverse drug reactions are identified according to severity, 3 are severe (18.75%), 11 are moderate (68.75%) and 2 are mild (12.5%) and in among them 68.75% patients are treated and 37.5% patients are untreated were shown in Figure 5. In total 25 drug interactions are reported, according to severity 4 serious, 20 significant and 1 minor and in among them 60% of patients are treated and 40% of patients are untreated as shown in Figure 6.

Table 1: Risk Factors

Factors	Males	Females	Total
Hypertension	52(60%)	38(40%)	90(36.43%)
Diabetes Mellitus	24(54.54%)	16(45.45%)	40(16.19%)
Hyperlipidemia	36(57.77%)	30(42.22%)	66(26.72%)
Alcohol/ Toddy	41(80.39%)	10(19.30%)	51(20.64%)
Total	153(61.94%)	94(38.05%)	247

Table 2: Other Disease Factors According To Age

Conditions	30-39 Yrs	40-49 Yrs	50-59 Yrs	60-69 Yrs	70-79 Yrs
HTN + Old CVA	0	0	3(8.10%)	1(2.56%)	4(13.79%)
HTN + Old CVA + others	1(20%)	3(15%)	7(18.91%)	6(15.38%)	2(6.89%)
HTN + others	0	5(25%)	8(21.62%)	15(38.46%)	8(27.58%)
Without HTN + others	0	2(10%)	1(2.70%)	0	0
HTN + habits	0	2(10%)	3(8.10%)	4(10.25%)	2(6.89%)
Only HTN	1(20%)	2(10%)	4(10.81%)	4(10.25%)	5(17.24%)
Only habits	2(40%)	3(15%)	7(18.91%)	6(15.38%)	4(13.79%)
Normal persons	1(20%)	3(15%)	4(10.81%)	3(7.69%)	4(13.79%)
Total	5	20	37	39	29

Others- diabetes, seizures, hypothyroidism, anemia, cardiac problems

Habits- alcohol or toddy consumption, smoker, gutkha chewer

Table 3: Drugs Distribution According To Age

| Drugs	30-39 Yrs	40-49 Yrs	50-59 Yrs	60-69 Yrs	70-79 Yrs
Anti-Hypertensives Mannitol Furosemide Telmisartan Amlodipine	3(13.04%) 0 1(4.34%) 1(4.34%)	6(6.79%) 1(1.29%) 4(5.19%) 2(2.59%)	13(10.15%) 1(0.78%) 6(4.68%) 6(4.68%)	10(10.10%) 0 3(3.30%) 9(9.90%)	9(13.43%) 2(2.98%) 2(2.98%) 7(10.44%)
Lipid Lowering Drugs Atorvastatin Rosuvastatin	4(17.39%) 1(4.34%)	10(12.98%) 9(11.68%)	20(15.62%) 11(8.59%)	17(17.17%) 5(5.50%)	9(13.43%) 2(2.98%)
Psycho-Stimulants Piracetam Citicoline Chlordiazepoxide	3(13.04%) 3(13.04%) 1(4.34%)	3(3.89%) 9(11.68%) 2(2.59%)	5(3.90%) 8(6.25%) 2(1.96%)	4(4.40%) 5(5.50%) 2(2.20%)	2(2.98%) 1(1.49%) 0
Hypo-Glycemic Drugs Metformin HMI* Repaglinide	0 0 0	2(2.59%) 3(3.89%) 4(5.19%)	4(3.12%) 5(3.90%) 3(2.34%)	1(1.01%) 3(3.03%) 2(2.02%)	2(2.28%) 7(10.44%) 1(1.49%)
Anti-Coagulants Heparin	0	1(1.29%)	1(0.78%)	0	0
Antiplatelets Clopidogrel+Aspirin Clopidogrel Aspirin	1(4.34%) 2(8.69%) 2(8.69%)	12(15.58%) 5(6.49%) 3(3.89%)	16(12.5%) 17(13.28%) 5(3.90%)	20(20.20%) 13(13.13%) 1(1.01%)	10(14.92%) 9(13.43%) 2(2.98%)
Antiepileptics Phenytoin	1(4.34%)	1(1.29%)	5(3.90%)	4(4.04%)	2(2.98%)
Total	23	77	128	99	67

HMI*- Human mixtard insulin
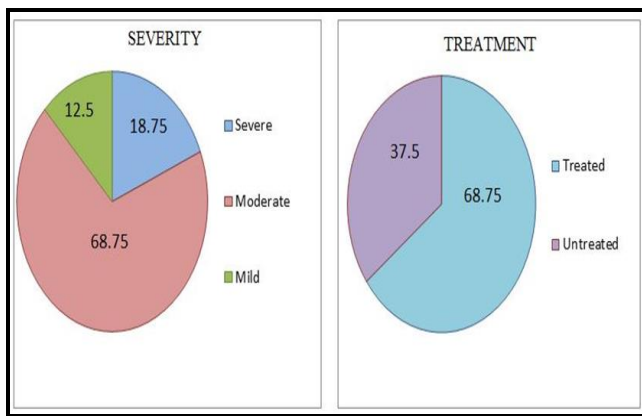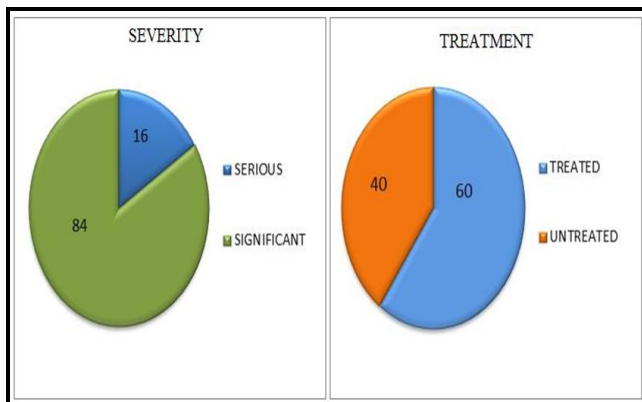
Figure 5: Adverse Drug Reactions Report

Figure 6: Drug Interactions Identified

Follow Up

In first follow up, medication adherence was poor in males when compared to females. Relapse was more commonly seen in males than females. In second and third follow up medication adherence is improved in males and therefore relapse is less seen in males.

CONCLUSION

Our research suggests that hypertension is the major risk factor and hyperlipidemia is the second major risk factor for CVA. To reduce hypertension, cholesterol levels proper patient counselling is required for the CVA patient. Among all drugs, anti platelet drugs are majorly given in males and lipid lowering drugs in females. Ischemia is the most predominant form of stroke found in our study. Proper prescribing pattern and monitoring the patients may prevent the ADR's and drug interactions occurring in stroke patients. Follow up of the patient should be taken for the medication adherence and to prevent relapse.

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